Young Children and Nature:
Outdoor Play and Development, Experiences Fostering Environmental Consciousness,
And the Implications on Playground Design

Ashley Parsons

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Committee Chair: Terry L. Clements

Brian F. Katen
Sonia A. Hirt
Marian B. Mollin

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ABSTRACT

Play is a pivotal part of a child's life. Outdoor play fosters opportunities for creativity, imagination, social connections, and learned behaviors. There are two types of outdoor playscapes: natural and constructed. Natural playscapes offer sensory stimulation and physical diversity which is critical for childhood experiences outdoors. Through careful design, constructed playscapes can be greened to simulate natural playscapes. Greening is the integration of natural elements and processes in a playscape. Children's direct social and individual experiences in nature in early to middle childhood during the "developmental window of opportunity" between the ages of three and twelve years help shape their environmental identity and guide their environmental actions. Outdoor play in greened playscapes has a positive effect on children's social development, motor skill development, attention, and activity level. It also can provide children with experiences in naturalistic landscapes which could impact their morals, values and actions. School yards have the ability to assist in teaching children and act as a safe-haven where parental concerns for safety and risk do not inhibit play. Understanding the relationships between play, experiences in nature, environmental identity, the health, learning, attention, and development benefits of outdoor play, and the evolution of playscape design, a series of guidelines can be created to provide better childhood playscapes.

Acknowledgements

       I would like to take this opportunity to thank my family for their continued support and dedication to my success. I do not know how I could have gotten through the late nights and long weekends without you. Kyra, my angel, you make my life worth living. Chris, you have provided me with more happiness than you can imagine. Mom and Clif, without you it would have been impossible. Dad, thanks for pushing me. My sisters, your always there when I need you. Thank you all so much!

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Table of Contents

Table of Contents

Table of Contents

List of Figures and Tables

Research Goals

The primary goals of the literature reviews are as follows:

- Outline different types of outdoor play

- Uncover the effect that outdoor experiences have on creating environmental identity

- Uncover the health, learning, and development benefits of outdoor experiences in early to middle childhood; specifically ages 3-12 years, children in pre-kindergarten through third grade

- To make a synthesis of findings of desired outdoor play opportunities and review trends in design of child's playscapes

The major goal of this research and the intention of the literature reviews are:

- To develop a set of guidelines for children's landscapes to help foster strong child outdoor experiences

Thesis Introduction

The primary purpose of this study is to understand the effects of children's experiences in outdoor play in an effort to answer the following principle questions:

- What potential benefits in health, motor function, and environmental identity does outdoor play have in childhood growth and development?

- What are the current challenges to providing children with outdoor play experiences?

- What are the recent trends in providing children with these experiences?

This research provides a foundation for understanding the importance of children's exposure to quality outdoor environments and play in terms of learning, development, and overall heath, creating a synthesis of the research. The literature alludes to the need for children to interact with each other and their outdoor environment in order to foster an appreciation and desire to preserve their local ecology.

The literature reviews show a lack of cohesive research on the connection between children, outdoor play, and the design of children's playscapes. However, the broad collection of current resources have moments of overlap that illustrate the opportunity for cohesion in future research on childhood connections to nature through outdoor play. Literature reviews provide a solid base for the creation of design guidelines which can foster childhood play experiences outdoors. Findings will be used to develop a set of guidelines for children's landscapes to help provide opportunities which can foster strong child outdoor experience. There are four categories of literature review:

Chapter 1- What is play and how does it relate to outdoor play, nature and wilderness experiences?

Chapter 2- What is the importance of childhood experiences outdoors in the creation of an environmental identity?

Chapter 3- What are the effects of outdoor play on health, learning, and development?

Chapter 4- What are the past and current trends for the design of children's playscapes?

Decreased interaction and decreased quality of interaction between children and outdoor environments has a negative impact on children's health, learning, and development. Play is important in childhood. The environment used for play is also important because different

Notes and Citations

1 Kals, Elizabeth and Ittner, Heidi. "Chapter 7: Children's Environmental Identity: Indicators and Behavioral Impacts." *Identity and the Natural Environment: The Psychological Significance or Nature.* (2003) pg 136

2 Fjortoft, Ingunn and Sageie, Jostein. "The natural environment as a playground for children: Landscape description and analyses of a natural playscape" *Landscape and Urban Planning* (2000) vol 48

playscapes offer different opportunities. Outdoor play is pivotal in creating a connection between children and nature. In addition, outdoor play has the ability to offer children stimulation which cannot be achieved indoors. There are two types of outdoor playscapes: natural and constructed. Each have unique characteristics.

Natural playscapes offer the most sensory stimulation and level of diversity when compared to most constructed and wild playscapes. These playscapes have diversity of sensory experience and physical structures which both challenge and engage childhood play. Constructed playscapes can offer similar opportunities if carefully designed.

Experiences in nature help to shape children's conceptions and values. Different types of contact with nature play different roles. While each of these types of contact are important for children to develop an environmental consciousness and identity, direct experiences are most important for childhood exploration of natural elements. Environmental identities have the ability to shape the way that children respond to protection of the environment.[1]

Many researchers and child play advocates are finding that the changing relationship between children and the outdoor world is having lasting effects on play and the creation of environmental identity, other researchers are finding that outdoor play offers countless health benefits. Attention levels and physical activity are two of these benefits. There is a connection between the level of greening in a school yard and the level of attention improvement. Greening refers to the integration of natural elements and processes into a constructed playscape. Children with increased activity levels are less likely to be overweight. Increased time outdoors increases activity levels. This means that increased outdoor activity, especially in greened playscapes, could decrease the occurrence of childhood obesity and the health problems associated with obesity. In addition, access to natural play elements can improve motor function and development.[2]

School yards evolved as theories on playground design changed to address research on childhood learning and play. From nineteenth century playgrounds that aimed to socialize lower-class children through exposure to higher-class children and adult behavior, to twenty-first century experiments in Imagination Playgrounds, child playscapes have been on the cutting edge of research in child development and play. Through understanding how playgrounds have evolved as research on play and child development has changed it may be possible to find moments of weakness and benefits in each type of playscape. By correcting these weaknesses and utilizing

benefits in future playground design it is possible to incorporate natural elements and encourage childhood experiences in nature as well as increase health benefits. Understanding the relationships between play, experiences in nature, environmental identity, health, attention, motor development, activity level, and the changes in how playgrounds have historically been designed it is possible to create a set of guidelines to better facilitate outdoor play and provide opportunities for experiences with natural elements.

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Notes and Citations

1 Educational publishers Algonquin Books in Chapel Hill, NC, urban design publications *Landscape and Urban Planning* and *Environment and Urbanization*, child behavioral research publications *Environment and Behavior*, and clinical publications *European Journal of Psychotherapy and Counseling* contribute to this research

2 Not all researchers agree on the implications of outdoor play on social and physical development (addressed in Chapter 3- Outdoor Play, Health, and Motor Development) or specific locations of outdoor play is most effective

3 Discussed in Chapter 4-Playground Evolution and Design

4 Fjortoft and Sageie (2000)

5 This research is not focusing on natural/ untouched ecosystems or constructed playgrounds

6 Garvey, Catherine. *Play*. The Developing Child Series. Cambridge, MA: Harvard University Press (1990)

7 Ginsburg, Golda S. and Kingery, J.N. "Evidence-based practice for childhood anxiety disorders." *Journal of Contemporary Psychotherapy*. (2007)

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Chapter 1: What is Outdoor Play?

Introduction

There is a great deal of established research on outdoor play.[1] Research on play crosses disciplines with work being done in design, behavioral psychology, political sciences, and social work professions.[2] All researchers agree that children's ability to play outdoors is pivotal to the childhood experience.

The issues addressed in this literature review position the larger question of this thesis: why do children need outdoor play experiences? These issues include the differences between indoor and outdoor play and discussion of different types of outdoor play environments.[3] Ingunn Fjortoft's and Jostein Sageie's article states that "there is no established methodology" for research on the use of natural environments as playgrounds for children.[4] This is in part because of a lack of previous research in this area and in part because this is an emerging area of interest. Through examining literature in the interdisciplinary field of play research it is possible to place this thesis at the intersection of child research, urban planning and landscape design. This literature review can then serve as a base for the examination of other areas of child interactions with outdoor experiences.

Within the context of childhood play, there are three emerging schools of thought on outdoor play and where the most effective play occurs: natural playscapes, wildland recreation, and constructed playscapes.[5] There are intersections and divergences in these three types of outdoor play, posing a dialogue and comparison which emphasizes the overall importance of outdoor play on children's health, motor function, and environmental consciousness.

What is Play?

Play is a pivotal part of a child's life. It fosters creativity, imagination, social connections, and learned behaviors. Play is the activity which can be defined as "a range of voluntary, intrinsically motivated activities that are normally associated with pleasure and enjoyment."[6] Play can also be considered a rehearsal for acting-out real life events- such can be seen when children play house or school. For children, play is a critical element of growing-up. The American Academy of Pediatrics states that childhood play is "essential for helping children reach important social, emotional, and cognitive developmental milestones as well as helping them manage stress and become resilient."[7] In fact, play is so essential that it is included in Article 31 of The United Nations Convention on the Rights of the Child, which states that it is not only

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Notes and Citations

8 Gary Paul Nabhan and Stephen Trimble are researchers who seeks to emphasize the importance of the interaction between people and the landscape

9 Nabhan, Gary Paul and Trimble, Stephen. *The Geography of Childhood: Why Children Need Wild Places.* Beacon Press: Boston. (1994) pg 10

10 Bartlett, Sheridan. "Children's experience of the physical environment in poor urban settlements and the implications for policy, planning and practice." *Environment and Urbanization.* (1999) vol 11 no 2 pg 68

11 Bartlett (1999)

12 Bartlett (1999)

13 Bartlett (1999)

14 Staempfli, Marianne B. "Re-introducing Adventure Into Children's Outdoor Play Environments." *Environment and Behavior.* (2009) vol 41 no 2 pg. 272

15 Fjortoft and Sageie (2000) pg 86

16 Fjortoft and Sageie (2000) pg 93

17 Dyment, J.E. and Bell, A.C. "Grounds for movement: green school grounds as sites for promoting physical activity." *Health Education Research.* (2008) vol 23 no 6 pg 959; Staempfli (2009) pg 272; and Fjortoft and Sageie (2000) pg 93

18 Youell, Biddy. "The importance of play and playfulness." *European Journal of Psychotherapy and Counselling.* (2008) vol 10 no 2 pg 122

19 Youell (2008)

20 Youell (2008) pg 126

a right for children to be engaged in play, but it is also a matter of equal opportunity for ALL children. Similarly to the United Nations, Nabhan and Trimble[8] state in The Geography of Childhood: Why Children Need Wild Places that children have an "unalienable right to play."[9]

Sheridan Bartlett defines play as passionately engaging in the surrounding world through "exploration, manipulation, physical exuberance, experimentation and pretence, either alone or with others."[10] Bartlett goes on to call play a "basic human drive" which is fundamental to development.[11] This claim is backed by information in neuropsychology and psycho-pharmacology which indicates "that distinct changes in the brain occur as a result of play" the results of which are specifically important in early life.[12] Bartlett continues by stating that the potential for this important early childhood learning takes place primarily in children's play.[13]

Marianne B. Staempfli states that not only is play important for brain development as Bartlett suggests, but play also helps children develop "flexible and divergent thinking" which then provides children with the ability to solve real world problems.[14] Similarly Fojortoft and Sageie's research on the natural environment as a playground for children in Norway identified three types of play each of which contributes to a different type of learning and development.[15] Functional Play corresponds to gross-motor and basic skill development. This can be seen in running, climbing, and other physically active play. Construction Play occurs when children move and create elements within their playscape. This contributes to creative thinking and problem solving skills. Symbolic Play or socio-dramatic play is the simple "role playing and fantasy play" which allows children to experiment with social skills for use in future real-life situations. According to this study, the "stimulation of inventiveness and creativity, and the possibility of discovery are directly related to the number and the kind of features in the environment."[16]

Experts agree that play is a form of informal cognitive learning.[17] Biddy Youell states that play is a form of cognitive development, and "a vital precursor of the capacity for work and love."[18] Interestingly, Youell also includes within her definition of play the idea that "play and work are not opposites, nor are they mutually exclusive" and play can be considered a form of experimentation with real-life situations; meaning that play can be found within work and vice versa and that play situations often afford some type of real-life learning- whether it be physical, mental, or social.[19] Youell concludes that "play and playfulness in a child's early relationships is of crucial importance in the development of… a secure sense of self or self esteem."[20] This suggests that the experience of play itself is important in the development of the

Notes and Citations

21 See Chapter 2- Nature and Childhood Experience for more information of the contribution of nature to the development of "self" in children

22 Youell (2008) pg 121; Staempfli (2009) pg 268

23 Youell (2008) pg 121

24 Youell (2008) pg 122

25 Youell (2008)

26 such as traumas, emotional issues, family stresses, etc...

27 Bartlett (1999)

28 Youell (2008); Fjortoft and Sageie (2000); Bartlett (1999)

29 Bartlett (1999) pg 63

30 Bartlett (1999) pg 68

future self and the ability to interact with the social environment and within the work environment.[21]

Youell and Staempfli both claim that indoor 'screen-based' activities, are causing the "demise of play" because media-centered play doesn't offer the variety of spaces that Fjortoft and Sageie suggest are important for different types of development.[22] Youell's study "locate[s] the origins of play and playfulness" in a child's early experiences. In addition, she notes that "children's development can be compromised if play and playfulness are not established in" early childhood.[23] Youell defines play as not only the fun and enjoyment of activities, but also as the ability to "think flexibly, take risks with ideas (or interactions), and allow creative thoughts to flow" and furthermore play is a social construction, in which there is a developing relationship between the participants.[24] This type of development can take place in many different types of play, but that the mutual relationship between participants in this case the environment in which the play takes place also serves as a participant.[25]

What is Outdoor Play?

Many child sociologists and psychologists believe that play can serve as a type of therapy, allowing children who suffer from high-stress situations to recover.[26] For impoverished children "high-stress" is a part of daily life. Issues such as hunger, learning disabilities, safety, transportation, and family conflicts act as constant reminders of the dangers and inequalities of every-day life. It would seem that in a life so dictated by extreme stresses such as these, play would be increasingly beneficial and essential in the lives of our poor children. Bartlett suggests that found spaces outdoors can act as opportunities for this therapy play.[27]

Recent design and planning research has shown that the environment used for play is important. Play in specific environments has different cognitive, social, and motor developmental impacts on children.[28] Bartlett states that the immediate environment in which children interact with each other that matters in play, and the immediate environment itself that has an impact. She also states that "neighborhood-wide development fails to understand the significance of play for children's development"[29] and that "many of the environmental hazards that children face become hazards in large part because of their drive for play."[30] In other words, children's drive to play often places them in situations and outdoor play places which are unsafe such as streets, building sides, abandoned lots, and street corners.

Interestingly, Bartlett suggests that this use of hazardous environments is because children play "ingeniously with whatever comes to hand and are resourceful and creative in drawing stimulation from their

Notes and Citations

31 Bartlett (1999) pg 68

32 Bartlett (1999) pg 68

33 Nabhan and Trimble (1994) pg 5

34 Bartlett (1999); Nabhan and Trimble (1994)

35 Staempfli (2009) pg 274

36 O'Brien, Liz. "Learning Outdoors: the Forest School Approach." *Education*. (2009) vol 37 no1 pg 46

37 The purpose of this research is not to determine which playscape is most beneficial to childhood play development, but merely to point to the different elements of each type of playscape and offer a consolidation of expert opinions.

surroundings."[31] This can be readily seen in areas where recreational facilities are not available for children. For example in impoverished areas where constructed playscapes are absent from daily child life; children find vacant lots, empty streets, and any available place for play.

Nabhan and Trimble discuss this topic in a slightly different way. They state that children see things differently than adults. Adults view the landscape at a larger scale and are able to see the big-picture of the playscape, such as a panorama with picturesque views. Children look at niches within their immediate environment. Bartlett suggests that "children tend to prefer the spontaneous opportunities offered on the streets, sidewalks, alleyways and vacant lots."[32] she also stresses the importance of availability of these outdoor play opportunities, however she notes that these places should be supported by parent, childcare, school, and community involvement to make these spontaneous playscapes safe play opportunities. They see moments in the landscape which offer immediate play opportunity. This is a difference between adult's vision of the world as abstraction and children's vision of the immediate world.[33] The shear difference in how adults see a play space and how children see the playscape can cause conflict.[34]

Because adults often see the larger picture, unplanned playscapes such as vacant lots and empty streets can seem undesirable as play places even though children can see the opportunity within the singular elements of these spaces. Staempfli states that this "has resulted in children growing up in an artificial world" which goes back to the changing nature of society's view of safe spaces for children's use" which contributes to the "decline in quality and quantity of play spaces available."[35] This raises the question: what specific playscapes are both safe and desirable by adults and serve the spontaneous and diverse play need of children.

O'Brien's claims that current "research highlights that outdoor play may be particularly valuable for children."[36] There are two distinguishable types of outdoor playscapes which experts point to as landscapes which can fulfil the need for childhood outdoor play: natural (or wild) and constructed places. It is important to understand the physical differences between these two play environments, and the opportunities that each offers children in play.[37] More research is needed on these types of playscapes to determine which is more or less beneficial to childhood development. But what is determined here is that some type of outdoor play is necessary.

Staempfli's research found that "the physical diversity of the natural landscape has a functional impact on children's behavior and play performance because it increases the opportunities for creativity, learning, and

Notes and Citations

38 Staempfli (2009) pg 237

39 Fjortoft and Sageie (2000) pg 83

40 Fjortoft and Sageie (2000) pg 83

41 Fjortoft and Sageie (2000) pg 84

42 Fjortoft and Sageie (2000) pg 84

43 Fjortoft and Sageie (2000) pg 84

44 Fjortoft and Sageie (2000)

45 Bixler, Robert D. and Floyd, Myron F. "Nature is Scary, Disgusting, and Uncomfortable." *Environment and Behavior*. (1997) vol 29 no 4 pg 444

46 Nahban and Trimble (1994) pg 12

47 Nahban and Trimble (1994) pg 11

development" and furthermore outdoor environments offer more of these opportunities because of their diversity.[38] Fjortoft and Sageie's research focuses on the use of a small forest as a natural playscape for children from a kindergarten in Bo, Telemark County in Norway.[39] This study makes a correlation between "landscape structure and play functions"[40] meaning that the physical environment has a direct relationship to the types of play that children participate in.

Two assumptions guided most of the research on outdoor play in these two environments: firstly, that there is a systematic way to "document the impact a natural environment might have on children's development,"[41] secondly, the ability to choose their own activity and create their playscape is important to children's play.[42] The primary hypothesis is that variation and diversity within the playscape will correspond to a desirable diversity in child play.[43]

Natural Play

The first and least researched environment for play is the natural environment. "Natural" is defined in many ways, most of which include an element of vegetation and the notion of diversity and spontaneity. In addition, natural playscapes are primarily natural process driven.[44] Most commonly these includes areas such as forests, fields, wooded areas, creeks wetlands, etc.

A small subset of natural play is wilderness play. Wilderness is defined as those areas which are completely untouched by human impact. Natural does not exclude human manicured or maintained areas, such as wetland parks, pasture, forests, etc. whereas, wilderness does. Those experts that point to the importance of wilderness play point specifically to niches of wilderness.[45] For example, a wilderness can be as small and simple as a flood plain in an uninhabited area or as complex as the Grand Canyon. Nahban and Trimble discusses wilderness play in terms of the "essence" that each play experience entails. They states that "playfulness may be the essence of wilderness experience."[46] The major difference between cities and wilderness is that cities are designed for one species, and designed to be inhospitable for other species.[47] Much of the literature distinguishing wilderness play from natural play are not backed by research and are focused on conjecture. For that reason within the context of this thesis and the importance of outdoor play for children, the distinction between wilderness and natural play will not be emphasized, but rather recognized as potential areas for future research.

Richard Louv's *Last Child in the Woods: Saving Our Children from Nature-Deficit Disorder* offers little scientific support for the need for children's outdoor play, but he does illustrate the growing opinion of

Notes and Citations

48 Louv, Richard. *Last Child in the Woods: Saving Our Children from Nature-Deficit Disorder*. Algonquin Books (2005) pg 7

49 Louv (2005)

50 Louv (2005)

51 Louv (2005)

52 Louv (2005); Fjortoft and Sageie (2000); Nabhan and Trimble (1994)

53 Fjortoft and Sageie (2000) pg 85

54 Weaver, Lisa L. "Learning Landscapes: Theoretical Issues and Design Considerations for the Development of Children's Educational Landscapes." Department of Landscape Architecture: Virginia Tech. (2000)

55 Bixler and Floyd (1997) pg 448

56 Bixler and Floyd (1997) pg 448

57 Staempfli (2009) pg 274

environmentalist and green parents that the declining direct interaction between children and nature is having negative effects on children's wellbeing. Louv coins the term "Nature-Deficit Disorder" to describe these negative effects. He also suggests that "nature inspires creativity in a child by demanding visualization and the full use of the senses."[48] Nature requires the use of all the senses: sight, sound, smell, touch, and taste. It is the diversity of sensory experiences that initiates a more creative learning environment for children.[49]

Louv provides a qualitatively based analysis of children's interaction with natural playscapes. He states that "in nature, a child finds freedom, fantasy, and privacy: a place distant from the adult world, a separate peace" which is in fact a "secret dream world" that children explore and learn from.[50] The natural environment offers children something that the constructed environment does not: diversity in sensory experience. It is through this diversity that children gain additional experiences in their outdoor environments.[51]

Diversity in the natural environment is and important catalyst for children's play.[52] There are three main categories within the context of play and the physical landscape structure: biodiversity, topographical diversity, and playscape habitat diversity.[53] Weaver states that diversity can be constructed through careful design. Here the issue becomes focused on natural diversity where Weaver becomes focused on constructed diversity through design.[54] For the purposes of defining the difference between natural and constructed play, diversity plays an important role. To researchers such as Louv, Nabhan and Trimble, and Fjortoft and Sageie, diversity is something that is only inherent in the natural landscape and cannot be developed as richly in constructed landscapes.

Constructed Play

Bixler and Floyd state that "natural areas may simply be uncomfortable places for many people accustomed to climate-controlled buildings."[55] For this reason, constructed playscapes can offer children the security they may need to enjoy outdoor playscapes. These playscapes must be carefully constructed to offer similar opportunities as natural playscapes.[56] Staempfli states that constructed playscapes have recently fallen short of school-ages children's needs by failing to integrate constructed garden and natural areas, offering constructive play materials, and providing spaces for symbolic play.[57] This points to the importance of diversity of the environment required in order to simulate natural play in a constructed playscape. Weaver illustrates the importance of the prescribed construction of combinations of diverse environments which developmentally serve children

Notes and Citations

58 Dyment and Bell (2008)

59 Dyment and Bell (2008) pg 952

60 Dyment and Bell (2008) pg 953

61 Dyment and Bell (2008) pg 957

62 Dyment and Bell (2008) pg 958

63 Dyment and Bell (2008) pg 959

64 Dyment and Bell (2008) pg 959

65 Dyment and Bell (2008)

66 Fjortoft and Sageie (2000) pg 85

67 Fjortoft and Sageie (2000)

School yards are the most important constructed outdoor playscape for children. Dyment and Bell explore how 'green' school grounds affect the quality and quantity of physical activity for elementary school children in Canada.[58] Their study shows that greening schools grounds can diversify the kinds of play acts as an "important intervention" in children's physical activities at school.[59] Increasing opportunities for children to have moderate physical activity during play will improve "the quality of children's play and learning experiences."[60]

Greened Playgrounds

Greened playgrounds are constructed playscapes which have been designed to incorporate natural processes and elements. This can be as simple as inclusion of vegetation, to as complex as the inclusion of rain gardens. Greened playgrounds have the ability to increase the quality of children's play by providing them with enjoyable and non-competitive opportunities,[61] this assumes that "all physical activity is not equal."[62] By increasing the diversity of play opportunities children are able to choose an activity which suits their physical and social capabilities in "physical activities which tangibly and meaningfully engage them in their environment."[63] The physical benefits work hand-in-hand with social benefits. Through green playgrounds children are encouraged to play cooperatively instead of competitively. According to Dyment and Bell's study, "playgrounds became much more peaceful and harmonious when play spaces are diversified."[64] There is also an important participation function in greening of school grounds; social benefits can be seen more dramatically "if students are involved in the process of greening."[65] It is important to note the continued reference to the need for diverse outdoor play environments in terms of topography, vegetation, play spaces, play opportunities, and use of senses.

Conclusion

As was noted by Fjortoft and Sageie, there are complications with describing and analyzing children's landscapes because "as adults, we perceive the landscape as forms, whereas children will interpret the landscape and terrain as functions."[66] This means adults are predicting an outcome based on forms within the landscape (vegetation, topography, and habitats) whereas children will use these spaces based on what their functions as a play environment. Adult prediction of uses decreases the effectiveness of judging the effect that diversity has on children's ability to "create" playscapes.[67] Adult interpretations of playscape uses leads to singular uses and doesn't allow spaces to function in multiple kinds of play. Because the teachers in Dyment and Bell's study accompanied children into the woods, it can also be assumed that their presence may have stifled some of the

children's creative play and adaptive use of the environment. The problem lies within the ability for adults to design for children due to their lack of shared landscape perceptions.

It is important to note that while there is a great deal of debate over the best specific location for outdoor play (natural or constructed), experts agree that play and specifically outdoor play is a pivotal part of childhood development. Outdoor play offers children a diversity of environmental stimuli that contributes to increased use of senses, increased health benefits, interactive physical activity, and experimentation with social situations that prepare children for future life experiences. Play is both a developmental and cognitive necessity. Outdoor play offers children a richer and more diverse play environment then indoor and often digital play which allows children greater creativity and flexibility in their play.

The experts consensus in the field of play research point to the need for additional research. Outdoor landscapes, whether they be constructed or natural, are important for childhood development and should be considered in policy, planning and design.

Category	Benefits	Specifics	Drawbacks
Play	develop flexible thinking	problem solving	children prefer spontaneous play which often leads to use of unsafe places for play
	brain development		
Outdoor Play	therapy	stress relief	children in socio-economically disadvantaged neighborhoods often don't have adequate outdoor playspaces
Natural Playscapes	higher sensory stimulation	sight, sound, taste, touch, smell	
	higher level of diversity	biodiversity, topographical diversity, playscape habitat diversity	
Constructed Playscapes	security and predictability		possibly can't be developed as richly as natural playscapes
Greened Playscapes	cooperative instead of competitive play	children are encouraged to play socially	
	diversify types of play	allows children to choose different play types based on their personal preference	

Table 1.1: Important Elements of Play

Notes and Citations

1 John Muir (1872)

1 Louv (2005); Nabhan and Trimble (1994)

2 Louv (2005) pg 1

3 Louv (2005) pg 2

4 Louv (2005)

5 Verbeek, Peter and de Waal, Frans B. M. "Chapter 1: The Primate Relationship with Nature: Biophilia as a General Pattern." *Children and Nature: Psychological, Sociocultural, and Evolutionary Investigations.* MIT Press: Cambridge, MA (2002)

Chapter 2: Nature and Experience

"I have low opinion of books; they are but piles of stones set up to show coming travelers where other minds have been, or at best signal smokes to call attention… No amount of word-making will ever make a single soul to know these mountains. As well seek to warm the naked and frost-bitten by lectures on caloric and pictures of flame. One day's exposure to mountains is better than cart loads of books."[1]

Introduction

This literature review examines research that links experiences in nature with childhood identity, environmental consciousness, and recommendations to re-establish the link between children and outdoor play. The connection made between children and their natural environment teaches life-long lessons that cannot be learned through screen-based activities. Children are experiencing less nature than previous generations.[1] Exposure to nature is needed for children to develop an environmental identity which encourages environmental consciousness. This exposure could potentially offer stronger physical, emotional and social health. This raises the question: what impacts does nature have on children? And what investigation is being conducted on the re-integration of children and nature?

Richard Louv's theory about the declining exposure and interaction of young children with nature is being developed at Penn State University. This theory suggests that "kids are aware of global threats to the environment- but their physical contact, their intimacy with nature, is fading"[2] and "nature is more abstraction then reality" to children.[3] In previous generations a connection with nature was inevitable, however with the increased use of television, computers, and video games children are more inclined to stay indoors than to go outside and develop connections with nature.[4] This hypothesis has been examined in psychological, sociocultural, and evolutionary studies. Verbeek and de Waal examined the evolutionary connection humans have to nature and found that until the current generation children were sent outdoors to wander the woods, play in streams, and generally self-entertain in nature. Due to the fears of pollution, kidnapping, and injury, today's children are being sent out to play in nature comparatively less.[5]

Childhood connection with nature is decreasing from generation to generation as emphasis on book-learning, media entertainment, and increased programed time are becoming more prevalent. This is creating a

Notes and Citations

6 Louv (2005) pg 34

7 Louv (2005)

8 Clayton, Susan and Opotow, Susan. "Introduction: Identity and the Natural Environment." *The Psychological Significance of Nature.* MIT Press: Cambridge, MA (2003) pg 6

9 Clayton and Opotow (2003) pg 6

10 Clayton and Opotow (2003) pg 7

11 Natural elements such as vegetation, water, fish, wildlife, insects and trees.

12 Kahn, Peter H. Jr. and Kellert, Stephen R. "Introduction" *Children and Nature: Psychological, Sociocultural, and Evolutionary Investigations* MIT Press: Cambridge, MA. (2002) pg viii

13 Kahn and Kellert (2002) pg viii

14   Sobel, David. *Childhood and Nature: Design Principles for Educators*. Stenhouse Publishers: Portland, Maine. (2008) pg 9

disconnection between children and nature. Richard Louv calls this disconnection "Nature-Deficit Disorder."[6] This disorder has been called the "human costs of alienation from nature" and includes a "diminished use of senses, attention difficulties, and higher rates of physical and emotional illness."[7] Nature-Deficit Disorder is hypothesized to be a contributing cause of childhood depression and Attention Deficit Disorder (ADD).

The term "nature" is often used to describe a variety of outdoor environments. Definitions of "nature" tend to be complex and represent the dichotomy between those landscapes which are human-influenced and those which are not. Clayton and Opotow suggest that "nature has long been subject to human influence through what is planted, supported, or tolerated, and what is exterminated either directly or through elimination of its habitat." Nature is a wide and varied continuum of human-derived landscapes and those with little to no human impact.[8] Clayton and Opotow define nature as "environments in which the influence of human is minimal or nonobvious, to living components of that environment (such as trees and animals), and to inanimate natural environmental features, such as the ocean shore."[9] Within the context of the discussion on experiences in nature, this definition is important because it stresses that experiences with nature "can take place in urban settings as well as in remote wilderness areas."[10]

Researchers suggest that children merely need to have access to natural elements- whether in an environment completely void of human influence or within a constructed play area. Within the context of this research "nature" includes any of the varied definitions researchers use to describe outdoor areas where natural elements[11] are abundant and diverse.

Connection and Experience

Kahn and Kellert offer and important perspective on why nature experiences are important for children. They suggest that there is an evolutionary significance of nature in childhood that offers evidence that children's physical and mental development is depended on experiences in nature.[12] According to this perspective experiences in nature help to shape children's conceptions and values and points to the educational changes that derive from decreased quantity and quality of experiences in nature.[13]

The majority of researchers agree that two elements are needed to create children who develop into environmentalist adults: "a keenly remembered wild place... and [an] adult who taught respect for nature."[14] Experiences in nature encourage children to become environmentally conscious. Children rely on their independent experiences with nature and the influence of adults who

Notes and Citations

15 Sobel (2008)

16 O'Brien (2009) pg 45

17 as stated in Leopold's 1949 *A Sand County Almanac*, quoted in Kahn, Peter H. Jr. "Chapter 6: The Development of Environmental Moral Identity" *Identity and the Natural Environment: Psychological Significance of Nature.* MIT Press: Cambridge, MA. (2003) pg 114

18 Kahn and Kellert (2002) pg viii

19 Kellert, Stephen R. "Chapter 5: Experiencing Nature: Affective, Cognitive, and Evaluative Development in Children." *Children and Nature: Psychological, Sociocultural, and Evolutionary Investigations.* MIT Press: Cambridge, MA (2002) pg 118

20 Kellert (2002) pg 119

21 Kellert (2002) pg 119

22 Kellert (2002) pg 119

23 Nahban and Trimble (1994) pg 120

24 Nahban and Trimble (1994) pg 131

25 such as pollution, water contamination, wildlife extinction, etc

26 Sobel (1996) pg 10

encourage them to experience nature. Sobel states that experiences in nature are more important than facts and book learning about nature to create childhood connections with the natural world.[15] O'Brien suggests that if "children do not visit woodlands and green spaces when they are young, they will become adults who do not use these spaces" and will become adults who have not developed social, cultural, and emotional connections with the natural world.[16]

Aldo Leopold addresses the topic of experiences in nature when he discusses the conservation ethic which states that experiences in nature help "people develop a 'love, respect, and admiration for land, and a high regard for its value.'"[17] Leopold stresses the importance in experiencing nature hands-on as a means to build a relationship with the natural world. Kahn and Kellert also stress the importance of hands-on experiences. These hands-on experiences are dependent on physical and environmental conditions. Gender, ethnicity, geographic location, and development level all influence childhood experiences outdoors.[18]

Experiences in Nature

There are three types of contact experiences in nature: direct, indirect, and vicarious or symbolic. Direct experiences are physical contacts with "natural settings and nonhuman species."[19] This includes play in abandoned lots, neighborhood park, forested area, creeks, etc...[20] Indirect experiences also include physical contact and more "restricted, programmed, and managed contexts."[21] Vicarious or symbolic experience is any experience that has no physical contact, for example through media.[22] While each of these types of contact are important for children to develop an environmental consciousness, direct experience are most important for childhood exploration of natural elements.

A child's immediate environment helps to shape the definition of home and assist children in understanding their relationship to their larger ecological community.[23] Nahban states that "every childhood landscape comes with a different set of building blocks from which to construct a life" and that the individual child's experience, whether rural, suburban or urban has the ability to "last throughout life."[24]

Sobel states that children are often taught about the dangers of environmental degradation[25] before they are developmentally able to understand the impact that such degradation has on their immediate surroundings. There is an "assumption that if children see the horrible things that are happening, then they too will be motivated to make a difference"[26] but according to Sobel, the opposite is true. Children often are desensitized to environmental degradation if they are exposed to it before they

Notes and Citations

27 Sobel (1996) pg 10

28 Nahban and Trimble (1994) pg 29

29 Sobel (2008) pg 16; Kellert (2002) pg 132

30 Sobel (2008) pg 17

31 Kahn (2003) pg 118

32 Sobel (2008) pg 17

33 Kellert (2002) pg 132

34 Nahban and Trimble (1994) pg 208

35 Kellert (2002) pg 132

36 Kellert (2002) pg 133

37 Kals and Ittner (2003) pg 135

38 Kals and Ittner (2003) pg 135

are developmentally ready to create the abstract connections which link them to the larger landscape. Children should to be exposed to education on environmental degradation only after they have the experiences that create a lasting bond between child and nature. Sobel states "let us allow them to love the earth before we ask them to save it.[27] This requires understanding the developmental and emotional need for natural experiences.

The Importance of Age

Outdoors experiences are important to create connections between children and nature. There is a time-frame in which these experiences needs to happen in order to create a lasting connection. While these experiences are often understood by children in retrospect,[28] experts point to the need for pivotal experiences to happen in the "developmental window of opportunity" which takes place between early and middle childhood.[29] This is primarily due to developmental reasons.[30] Kahn states that developmentally children in early childhood begin to develop understandings of the plant and animal world.[31] Children in early to middle childhood have what Sobel calls "magical thinking" which optimizes "the opportunity for transcendent nature experiences in middle childhood."[32]

During early childhood between the ages of three-six years children form utilitarian connections; understanding nature as it means to them directly. For example, a child of four or five can see a stick as a sword, kings' staff, or drawing utensil.[33] After five-seven years when middle childhood begins, children's brains are developed enough to be capable of a greater sophistication of learning, or what Piaget calls concrete operations.[34] As children enter middle childhood they begin to see the world in terms of connections to the larger natural world; this is called a biocentric perspective. Children in middle childhood develop humanistic, symbolic and aesthetic perspectives on nature.[35] This means that children are able to abstract the importance of natural elements past their own personal needs or desires. For example, a child of seven or eight is capable of understanding that not only is the stick a device which can be used for play, he/she is also able to make abstract connections to the stick as a branch that brings nutrients from the tree-trunk to the leaves and assists in the creation of oxygen.[36]

Children in primary school "have clear concepts about the natural environment, its problems and risks, their own ability to reduce the risks as well as the ability of powerful others, and also who they regard as responsible for reducing these risks."[37] This moral "reasoning together with positively experienced emotions, promotes nature protective behavior."[38] This means that children in early-middle childhood are able to develop understand-

Notes and Citations

39 Gebhard, Ulrich et al. "Chapter 5: Moralizing Trees: Anthropomorphism and Identity in Children's Relationships to Nature" *Identity and the Natural Environment: The Psychological Significance of Nature.* MIT Press: Cambridge Massachusetts. (2003)

40 Gebhard et al (2003) pg 108

41 Kals and Ittner (2003) pg 137

42 Gebhard et al (2003) pg 99

43 Kals and Ittner (2003) pg 152

44 Sobel (2008); Kellert (2002); Heerwagen, Judith H. and Orains, Gordon H, . "Chapter 2: The Ecological World of Children" *Children and Nature: Psychological, Sociocultural, and Evolutionary Investigations.* MIT Press: Cambridge, MA (2002)

45 Kellert (2002) pg 134

46 Sobel (2008) pg13

47 Sobel (2008) pg 9

48 Sobel (2008) pg 15

49 Heerwagen and Orains (2002) pg 30

50 Heerwagen and Orains (2002) pg 35

51 Kahn, Peter H. Jr. *The Human Relationship with Nature: Development and Culture.* MIT Press: Cambridge, MA. (2001)

ings which morally link the natural world to their own immediate world, creating a biological systems understanding about the inter-relationships between humans and the natural world. In early childhood children develop anthropomorphic connections with nature.[39] Children attribute human emotions and mental capacities to non-human elements such as trees and other animals which creates a "categorical identity that permits nature to be moralized" later in middle childhood.[40] The attribution of anthropomorphic characteristics to non-human natural elements in early-middle childhood assists children in creating an environmental identity.[41] According to Gebhard et al "anthropomorphic projection diminishes with increasing age."[42]

Early childhood anthropomorphic connections to the natural world and middle childhood biocentric connections to the natural world work hand-in-hand in the creation of a child's environmental identity and environmental consciousness. The environmental identity developed by children in early-middle childhood is "an emotional affinity towards a specific aspect of nature" which had been strengthened by "providing positive experiences with nature on a regular basis."[43]

The Moment that Matters

During middle childhood it is important to provide opportunities for these experiences to shape the developmentally appropriate values and cognitive learning about nature.[44] Some researchers suggest that there is a "moment" during middle childhood, between the ages of 6-12 years, when a child has a life-altering experience in nature. This moment can be called an "imprint" and creates a lasting impression which helps to shape the way a child sees nature for the rest of their life.[45] Sobel states that "one transient experience in nature is worth a thousand nature facts."[46] Adult environmentalists often describe this moment as the reason for their environmental consciousness.[47] Interestingly, "imprint" is rarely recognized at the time as being a pivotal moment and although the experience of that moment is significant in the child's life, children do not have the developmental capability of describing that experience until adulthood.[48] Because individual environmental experiences are not equally important across the human life span[49] the immediate response of a child to what will eventually be recognized as the imprinted moment or experience will vary with age and development.[50] For this reason children should be offered many varying experiences in nature, each catering to the individual child's interests and development level.

Environmental Identity

People make moral decisions and distinctions based on personal experience.[51] These experiences can

Notes and Citations

52 Clayton and Opotow (2003) pg 45

53 Kals and Ittner (2003) pg 136

54 Kals and Ittner (2003) pg 135

55 Bixler and Floyd (1997) pg 444

56 Bixler and Floyd (1997)

57 Clayton and Opotow (2003) pg 5

58 Clayton and Opotow (2003) pg 11

59 Clayton and Opotow (2003)

60 Clayton and Opotow (2003) pg 10

61 Clayton and Opotow (2003); Gebhard et al (2003) pg 91; Kals and Ittner (2003) pg 152

62 Clayton and Opotow (2003)

63 Clayton and Opotow (2003), pg 10; Kals and Ittner (2003) pg 152

64 Clayton and Opotow (2003)

be religiously, familial, social, cultural, or academically based. Moral decisions and values developed through the environment experiences have the ability to either define a conservative environmental standpoint, or a moral standpoint of indifference. The experiences of the individual create that moral standing; or in some cases the lack of experiences. This moral value or standing can also be called a person's environmental identity.

Environmental identity is a way of organizing "information about the self" in relationship to the natural environment based on context and experience.[52] Environmental identities have the ability to shape the way that children respond to protection of the environment.[53] In childhood, the development of an environmental identity through experiences "can be triggered even by short-term interventions" and experiences in nature.[54] A strong environmental identity "has been found to be related to later career choice."[55] Children who feel a strong moral obligation to nature are more likely to pick careers which strive to protect and preserve some aspect of the natural world.[56]

The Importance of Social Groups

Clayton and Opotow define identity as "beliefs about who we are and who we want to be" and state that in childhood identity is defined based on the distinction between is and is not.[57] This has to do with definition of who the child is, and who the child is not; a distinction derived from social and cultural standpoints. Environmental identity is derived by the connection between society and environment.[58] A child's view of the environment is largely shaped by influences of the adult community around the child.[59] The impact of social factors on a child's environmental identity can be seen as a spectrum between two extremes: minimal influence and strong influence.[60]

Environmental identity is developed by both social and personal relationships with nature. The dynamic between social identity and personal identity create an overall identity, sometimes personal and social identity varies in influence, but it takes both.[61] Children who are minimally influenced by social factors understand their experiences in nature in direct terms. They witness and experience nature according to their own wants and desires, and build their own opinions.[62] If a child is strongly influenced socially they are more likely to identity within a social group and perceive environmental issues as that larger group perceives them.[63] While both highly socially influenced children and less socially influenced children will develop some environmental identity as a result of experiences in nature, it is those children who are more socially exposed to nature that have the strongest connection with their immediate environment.[64]

Notes and Citations

65 Kahn (2001) pg 69

66 Kahn (2001) pg 212

67 Kals and Ittner (2003)

68 Kahn (2001) pg 101; Clayton and Opotow (2003) pg 15; Gebhard et al (2003) pg 92-93

69 Kahn (2001) pg 101; Clayton and Opotow (2003) pg 15

70 Kahn (2001) 107

71 Myers, Olin Eugene and Saunders , Carol D. "Chapter 6: Animals as Links toward Developing Caring Relationships with the Natural World." *Children and Nature: Psychological, Sociocultural, and Evolutionary Investigations*. MIT Press: Cambridge, MA (2002) pg154; Nahban and Trimble (1994) pg 25

72 Kahn (2001) pg 112; Coley, John D., Solomon, Gregg E. A. and Shafto, Patrick. "Chapter 3: The Development of Folkbiology: A Cognitive Science Perspective on Children's Understanding of the Biological World" *Children and Nature: Psychological, Sociocultural, and Evolutionary Investigations*. MIT Press: Cambridge, MA (2002) pg 72

Children begin forming moral judgments and values as they are exposed to different stimuli and experiences. According to Kahn, "children at a relatively early age have concepts that are prescriptive, generalizable, not contingent on societal rules, laws, and conventions, and justified by considerations of justice and welfare."[65] The understandings that children have are often developed based on that individual child's view of what is fair and unfair, and what is right and what is wrong. Children with strong moral relationships with other people will develop stronger moral relationships with the natural world.[66] Children who value human life because of experiences with other people are more likely to attribute the same moral standing to the non-human world, creating a stronger connection to nature by attributing a similar value to non-human life as to human life. For children, peer groups the most influential and important social influences. The setting of peer influences is important and school is often the most exposed children are to their peers. School grounds can play a pivotal role in the creation of a environmental identity.[67]

Animals and Environmental Identity

Children see morality of nature in spectrum between two extremes: anthropocentric or biocentric. Anthropocentric morality is understanding nature in terms of its impact on human life.[68] Children who see nature anthropocentrically see elements in nature as they impact human life. For example a child who views nature in this way is more likely to justify environmental preservation for the benefit of human life. Biocentric views of nature are more focused on the moral standing of nature because it is nature, not because of its value to human life.[69] Such a child would justify environmental preservation not because it benefits human life, but because it is valuable in and of itself.

While anthropocentric and biocentric views of nature are important foundations of environmental identity and the development of a moral judgment attributed to nature, children who show an understanding of animals and a connection with animals are more likely to see biocentrically because they are more likely to believe that "animals deserve the same moral considerations as humans."[70] Researchers have also found that children who care about animal life are more likely to have a broader environmental care.[71] Urban children generally feel less affiliation with animals and were more likely to see nature anthropocentrically.[72] There is a sense of morality in caring for a non-human life that could translate into a broader morality of life in general.

Environmental Identity Leading to Action

Experiences in nature are important to developing

Notes and Citations

73 Gebhard et al (2003)

74 Kahn (2001) pg 98

75 Clayton and Opotow (2003) pg 19

76 Clayton and Opotow (2003) pg 4

77 Clayton and Opotow (2003) pg 17

78 Kahn (2001)

79 Kahn (2001) pg 46

80 Kahn (2001) pg 46

a strong childhood environmental identity, however education and learning in other settings also play a strong role.[73] A study on children in Houston suggests there is a difference between knowledge of and caring for the environment. There is a possible positive correlation between increased knowledge and increased caring, which then plateaus at a certain knowledge point. A combination of factual and academic learning about nature and direct experiences in nature, whether through social environments or individual exploration, is required to develop a strong connection with nature and an environmental identity. According to Kahn, "results showed that out of a possible score of 11 (the most pro-environmental score), first-graders mean score was 7.7, which was statistically less than the score for third-graders at 9.6, and fifth-graders at 9.5."[74]

While environmental identity is not a predictor of environmental action,[75] often involvement in social groups is. According to Clayton and Opotow people who are members of social groups are more likely to have stronger environmental values.[76] As a member of a social group, environmental identity and action are partially derived "by how individuals and groups position themselves with or against others on environmental issues."[77] Children who belong to a social group with positions on environmental issues tend to be active on those issues. In this way social affiliation plays a dynamic role with natural experiences in creating an environmental identity, and in encouraging environmental actions. Social groups who encourage biocentric thought and action are more likely to create children who also think biocentircally and act according to their environmental values. Similarly, social groups who encourage anthropocentric thought and action create children who also think anthropocentrically.

Development Theories

Developmental theories offer a methodology to understand the development of the human/nature relationship in children. Children use their existing knowledge of other things to develop understandings of the world and make decisions on how to act accordingly.[78] Kahn poses four explanations for how people develop: endogenous, exogenous, casual interactional and structural development.[79] According to Kahn, endogenous theory largely points to internal processing of information, and exogenous theory largely points to external methods of understanding.[80] The difference between endogenous and exogenous theory can be more easily thought of as nature verses nurture. In this case endogenous is nature where the biological make up of a person decides how a person will develop knowledge, and exogenous is nurture where it is the influence of things around the person causes them to develop in one fashion or another.

Notes and Citations

81 Kahn (2001) pg 47

82 Kahn (2001)

83 Kahn (2001) pg 4

84 Kahn (2001) pg 4

85 Kahn (2001) pg 61

86 Kahn (2001)

87 Kellert (2002) pg 117

88 Kellert (2002) pg 120

89 Kellert (2002) pg 121

Structural development theory differs from both endogenous and exogenous. It proposes that "development is grounded in human knowledge and values, in the active mental life of children as they construct increasingly more adequate ways of understanding their world and of acting upon it."[81] Structural development theory takes an evolutionary approach to understanding how people process knowledge and experiences. Structural Development Theory explains that through experience comes understanding and the creation of values and is widely accepted as a standard in explaining how children develop through their experiences. Kahn expands this theory to more specifically address experiences in nature. According to Kahn, children in lower income neighborhoods, specifically black children, are more likely to have inadequate experiences. He also suggests that a constructivist approach to environmental education is needed.[82]

Structural development theory suggests that "through interaction with a physical and social environment children construct conceptual understandings and values."[83] Kahn points out that the most important element of structural development theory is that it explains the transformative nature of learning which allows children to understand knowledge through "active, original thinking."[84] One of the most critical parts of structural development theory is that it accounts for people's individual construction of concepts. Kahn explains these constructions as "mentally organized" and structured forming systems of understanding knowledge and experiences based on individual exposure to situations. These understandings then influences responses to similar situations.[85] In simpler terms, experiences create values which then create judgments which then translate into actions.[86] This process is both hierarchical and cyclical as it evolves with each experience.

Processing Experiences

Structural Development Theory identifies three types of experiences in nature: direct, indirect, and symbolic or vicarious experience.[87] Kellert states that these three types of experiences should be linked to three critical learning types: cognitive or intellectual development, affective maturation, and evaluative development.[88] Cognitive or intellectual development is primarily problem-solving, and how a child develops a thinking pattern about a specific situation. Affective maturation focuses on the development of emotional capacity, and how a child feels about a situation. Evaluative development stresses the "creation of values, beliefs, and moral perspectives.[89] While all three types of learning are important for children to interpret experiences, evaluative development is the most important to environmental identity creation. Evolution from one type of learning to the next creates a truly individualistic experience with

Notes and Citations

90 Folk theory is also sometimes called "folkbiology" Kahn and Kellert (2002)

91 Kahn and Kellert (2002) pg xi; Coley, Solomon, and Shafto (2002)

92 Coley Solomon and Shafto (2002) pg 65

93 Verbeek and Waal (2002) pg 20

94 Verbeek and Waal (2002)

95 Coley, Solomon, and Shafto (2002) pg 65

96 Coley, Solomon, and Shafto (2002) pg 78

97 Coley, Solomon, and Shafto (2002)

98 Louv (2005)

99 see Chapter 3- Literature Review: Outdoor Play, Health and Motor Development

nature which then translates into an environmental identity.

Folk Theory

Folk Theory is within the realm of structural theory.[90] Specifically, folk theory addresses how children interpret and understand the world of plants and animals.[91] The way that we understand and explore these connections are called folk theories. Folk theories can be defined as "informal, often intuitive ways of explaining the what and the why of the world."[92] Under this theory, children develop by exploring the habitat around them and by doing so they widen their "circle of adaptation, based on direct perception of the environment."[93] These explorations create emotional connections between place and experience which lead to associations which later influence the child's environmental identity. According to Verbeek and Waal, the process of learning and discovering about and from nature through exploration is an important developmental phase of both human children and other young primates. Children learn by exploring boundaries.[94]

Children relate new information based on their old experiences.[95] Folk theory is a theory of prediction; by creating folk theories about situations and environments children can better understand and predict outcomes in new situations.[96] In this way, we understand new things based on what we already know. Children understand things according to folk theories that are different from adult folk theories. Childhood experiences with the distinction between "living" and "nonliving" drive their understandings of nature. More simply, what things are animal and what things are everything else. As children age their experiences with nature blur the distinction between living and non-living, creating a more holistic view of nature as a process and connection of living things.[97] Folk theories assist in the creation of an environmental identity.

Conclusion

The experiences that children have in nature significantly impact the way that children develop a connection with nature and an environmental consciousness and identity. Childhood connection with nature is decreasing due to an increase in indoor learning and play.[98] This decrease is causing what Richard Louv calls "Nature-Deficit Disorder" and impacts children's health, attention, motor development, and future environmental actions.[99] Childhood environmental identities influence thoughts and actions.

Social interactions outdoors also are important in the creation of an environmental identity and consciousness. While individual experiences in nature are

important for children to develop their own understandings and relationships, interactions in nature within the context of a group can be even more important in shaping how a child will respond to their connection to a specific natural element. Children who are a part of an environmentally active social group are more likely to be environmentally active also.

Direct, indirect, and vicarious experiences in nature are important to shape a child's emotional connection to nature. These experiences must happen during a specific developmental age range in order to have a lasting impact on future environmental identity and environmental actions. Early to middle childhood, when children begin to think anthropocentrically and biocentrically is the critical stage. Biocentric and anthropocentric thought greatly affects that way that children view natural elements. Children who see biocentrially think of natural elements as implicitly valuable while children who see nature anthropocentrically value natural elements according to their human use. Both have value in environmental identity. Children develop cognitive and emotional associations based on their experiences. Structural Development Theory and folk theories explain how children create connections between experiences in order to predict possible outcomes. Experiences in nature can play an important role in whether a child will develop an environmental identity that regards nature as valuable and worthy of protection.

As environmental degradation becomes a greater concern all over the world, it is important for people to recognize and assist in protecting nature. Children represent the future. It is critical for children to develop environmental identities that care for their environment. For designers of child playscapes, it is important to recognize these aspects of childhood experiences and development so that we can create opportunities in child landscapes to foster children with the natural experiences which will set up opportunities to shape environmentally active identities.

Benefits	Needed	Drawbacks
shape children's values and morals	adult who teaches respect for nature	urban children often don't have opportunities to experience natural areas
helps shape child conception of "home"	a keenly remembered natural place	
potential to help develop environmental identity	direct, indirect, and vicarious experiences	hands-on experiences are dependent on physical and environmental conditions
	experiences must happen during the "developmental window of opportunity" between 3-12 years of age	critical moment between 6-12 years of age
	social and individual experiences	
	experiences with living nature	there are limits to interaction with living nature

Table 2.1: Important Elements of Nature Experiences

Ashley Parsons

Notes and Citations

1 Louv (2005) pg 3

2 Louv (2005)

3 Belcher, Sarah. "Ecological Schoolyards: Landscapes of Empowerment." Department of Landscape Architecture: Virginia Tech. (2003) pg 5

4 Bixler and Floyd (1997)

Chapter 3: Outdoor Play, Health and Motor Development

Introduction

    Research on the effects of outdoor play on childhood health is being conducted by early childhood development psychologists, pediatric health professionals, and behavioral scientists. Little research has been done to address this subject within the design fields. More hands-on research that looks at specific landscape types and their individual effects on health must be done to substantiate the sparse research currently available. This literature review summarizes, compares, and explores the research findings. The findings point to similar conclusions: outdoor play is becoming increasingly important in academic environments to improve child attention levels, increase physical activity levels, decrease occurrences of childhood obesity, increase motor development, and act as an arena for social skill development.

    Children's outdoor play and interaction with natural elements influences learning, development, and overall heath. This literature review reveals that outdoor play has a positive effect on children's social development, motor skill development, and activity level.   This section discusses the importance of outdoor activities on attention level, activity level, obesity, motor development, and gender related differences .

    Many researchers and child play advocates found that the changing relationship between children and our outdoor world is having lasting effects on play and the creation of environmental identity, other researchers are finding that outdoor play offers countless health benefits. Louv states that "at the very moment that the bond is breaking between the young and the natural world, a growing body of research links our mental, physical, and spiritual health directly to our association with nature - in positive ways."[1] Nature also can serve as a type of therapy for Attention Deficit Disorder and other childhood disabilities.[2] Similarly, Belcher, a masters student in Landscape Architecture, indicated that "environmental Psychologists recognize that contact with nature and vegetation promotes a sense of well-being" and that "individuals who are exposed to certain environmental patterns are less likely to become ill, and are more likely to heal faster."[3] Bixler and Floyd conclude that research is shows there are characteristics of the natural environment that can reduce stress and issues such as depression, attention difficulties, and physical activity levels.[4]

Attention

    Louv describes his outdoor experiences during

Notes and Citations

5 Louv (2005) pg 10

6 Holmes, Robyn M. et al. "The effects of different recess timing regimens on preschoolers' classroom attention." *Early Child Development and Care.* vol 176 no 7. (2006) pg 735

7 Holmes et al (2006) pg 735

8 Holmes et al (2006)

9 Holmes et al (2006)

10 The No Child Left Behind Act of 2001. Public Law 107-110. The Department of Education

11 Holmes et al (2006) pg 736

12 Holmes et al (2006) pg 737

13 Holmes et al (2006) pg 738

childhood as medication; his experiences heightened his senses, focused his attention, and calmed him.[5] Louv's experience of outdoor play's ability to affect his attention span is shared by many adults. Researchers have recently begun to see a correlation between time spent outdoors and childhood occurrences of Attention Deficit Disorder (ADD), Attention Deficit and Hyperactivity Disorder (ADHD), and Depression. Holmes et al. examined the effects different lengths of recess time had on preschoolers by observing children before and after recess and on the playground during recess. Thier study found that "post-recess attention was greater following sustained outdoor play periods" but that attention was dependent on the length of time spent at recess and the gender of the child.[6] Post-recess attention was higher for both female and male students, however female students were more attentive then male students both before and after recess. According to Holmes et al. "it seems reasonable that outdoor recess breaks rejuvenate young children and help them attend to classroom tasks".[7]

Increased academic work demands stemming from the increased pressure for schools to perform to state established standards of learning is public schools within the United States to reduce the amount of recess time. This is becoming an increasingly popular movement in public primary schools.[8] Generally, this movement centers around the idea that recess time takes away important academic learning time- placing recess and instructional time at odds with each other. However, researchers have shown the opposite is true. There is a positive correlation between recess time and attention to academic work. Children are more attentive after regular recess breaks then they are without such breaks.[9]

While it is clear that children need quality instructional time to meet the requirements of federal legislation such as The No Child Left Behind Act which attaches federal funding to success at state standardized tests,[10] it is also clear that children need recess time to refocus and become more attentive during instructional times. Recess is a controversial issue. According to some skeptics, recess leads to bullying and interferes with children's ability to attend to their school work.[11] In contrast, proponents of recess claim that learning is maximized by taking breaks and that younger children need these breaks more than older children.[12] These conflicting opinions create a paradoxical situation which researchers are seeking to address.

Holmes et al. introduces the idea of Developmentally Appropriate Practice which states that "young children need a schedule in which there is a balance between child-initiated activities (such as free-play during recess) and teacher-led activities (such as academic instruction)."[13] Interestingly, Holmes et al also noted that recess

Notes and Citations

14 Holmes et al (2006) pg 783

15 Holmes et al (2006) pg 742

16 Holmes et al (2006) pg 742

17 Dyment and Bell (2008) pg 960

18 Dyment and Bell (2008) pg 960

19 Holmes et al (2008)

20 Orr, David W. "Chapter 11: Political Economy and the Ecology of Childhood." *Children and Nature: Psychological, Sociocultural, and Evolutionary Investigations.* MIT Press: Cambridge, MA (2002) pg 279

21 Robert Wood Johnson Foundation. "Designing for Active Living Among Children." Active Living Research. (2007) pg 1

22 Robert Wood Johnson Foundation (2007) pg 1

23 Robert Wood Johnson Foundation (2007) pg 2

24 Robert Wood Johnson Foundation (2007) pg 4

25 Robert Wood Johnson Foundation (2007) pg 4

"periods that are either too short or too long may actually have negative effects" specifically after lunch periods where "long break periods… often witness high rates of anti-social behavior and student boredom."[14] The study showed that boys reach their peak attention after a 20 minute recess time while girls reach this peak of performance after 10 minutes and maintain similar attention spans through 20 minutes."[15] In general boys were less attentive than girls in all conditions" and "results point to the importance of [longer] breaks for boys, relative to girls."[16]

There is also a connection between the amount of "green" in a school yard and the level of attention improvement. Dyment and Bell found that cognitive development is a benefit of school ground greening because "green settings generally may help to promote increased concentration, attention functioning, and self-discipline."[17] Additional studies have shown that "children with ADD have fewer attention deficit symptoms after spending leisure time in natural settings."[18] From this research we can generalize the following: preschoolers and primary school aged children benefit from recess; there is an optimal level of recess time which results in the greatest benefits; and recess appears to optimize attention but does not have similar effects on social behaviours.[19]

Orr states that "nationwide, 17 percent of children are on Ritalin, an antidepressant."[20] More research needs to be done to see if there is a correlation between those children whom are on antidepressants or other attention enhancing medications and the length of time spent outdoors in comparison to other children. Current research on the positive benefit of children's outdoor play especially in a primary school setting is promising. More in-depth examination is needed on the ability of outdoor activity to alleviate difficulties in childhood attention.

Activity Level

Low physical activity levels are a contributing factor in the occurrence of obesity in children.[21] The U.S. Surgeon General states that children should participate in at least sixty minutes of moderate physical activity most days of the week.[22] Children who live in communities which are considered "walkable" and have parks, trails and recreation programs tend to be more physically active than those living in communities with fewer opportunities for outdoor activity.[23]

Parental concerns about neighborhood safety also play a large part of children's activity levels.[24] In neighborhoods where parents feel a safe from traffic and criminal activity children were more likely to spend more time outdoors, have higher average activity levels, and were less-likely to be overweight.[25] Increasing children's level of physical activity can improve attention-span, facilitate

Notes and Citations

26 Robert Wood Johnson Foundation (2007)

27 Dyment and Bell (2008) pg 953

28 Dyment and Bell (2008)

29 Alhassan, Sofiya et al. "The effects of increasing outdoor play time on physical activity in Latino preschool children." *International Journal of Pediatric Obesity.* (2007) no 2 pg 153

30 Alhassan (2007) pg 156

31 Alhassan (2007) pg 157

32 Brown, William H. "Social and Environmental factors Associated with Preschoolers' Non-sedentary Physical Activity." *Child Development.* (2009) vol 80 no 1 pg 45

33 Brown (2009) pg 45

34 Brown (2009) pg 46

35 Brown (2009) pg 49

36 Brown (2009) pg 52

social interactions and set standards for life-long practices such as remaining physically active throughout adulthood.[26]

Dyment and Bell discussed the need for school playscapes to include a variety of areas for varying activity levels. This includes hard-tops and turf for competitive and sports-related play (considered high activity level) and opportunities for less vigorous play (medium activity level playscapes). Activity centers for varying activity levels of play would "appeal more broadly to children of varying interests and abilities."[27] This would allow greater variability in types of play and potentially offer more children involvement in physical activities during outdoor play, but it has the ability to also improve the social functioning of children on the playground. Enriching the quality of play by offering a variety of opportunities for different activities will become a trigger for increased physical activity, thereby reducing the risk of obesity.[28]

The correlation between activity level and time spent outdoors has been questioned by some researchers. Sofiya Alhassan et al studies this correlation. They tested whether increasing preschool children's outdoor play time increases their physical activity levels and found that "substantially increasing preschoolers' outdoor free play time did not increase their physical activity levels"[29] but there are ideal lengths of time for preschool outdoor free play dependent on activity type.[30] Because activity level is different for various types of outdoor play there is a limited correlation between time spent outdoors and activity level.[31]

William H. Brown et al examined two factors of children's behavior: they sought to describe the physical activity behaviors and social and environmental events of preschool children; they sought to find predictors of activity levels.[32] This study derived directly from the connection between childhood activity levels and obesity; specifically that "children's early overweight problems predict adult obesity" and the prevention of obesity is a "national health priority."[33] Programs at pre-school and primary school levels offer opportunity to address such health concerns.[34] According to the Brown et al study, children observed in the study spent 87% of their day indoors, 94% of that time was sedentary, and only 10% of their time outdoors consisted of "active" physical activities such as walking, running, crawling, climbing, and jumping or skipping.[35]

One of the most important findings of Brown et al's study was that child-led outdoor activities tended to be more active than teacher-led playground activities such as organized games.[36] Thompson et al also discussed childhood socialization which either encourages

Notes and Citations

37 Thompson, Andela M. et al "Factors Influencing the Physically Active Leisure of Children and Youth: A Qualitative Study." *Leisure Scienves* (2005) pg 434

38 Dyment and Bell (2008) pg 956

39 Dyment and Bell (2008) pg 957

40 Dyment and Bell (2008) pg 957

41 Orr (2002) pg 281

42 Brown (2009)

43 Brown (2009) pg 45)

44 Brown (2009); Robert Wood Johnson Foundation (2007)

45 Thompson et al (2005) pg 421

or discourages physically active leisure activities. According to their study, "participants in elementary school were most strongly influenced by their parents and their [parent's] ability and opportunity to play"[37] which suggests that parental activity levels play a dominant role in their children's activity levels.

In Dyment and Bell's survey group "participants gave strong indication that green school grounds were providing more opportunities for physical activity."[38] In addition, green school grounds offer alternative types of play activities with a range of physical demands. Studies done in Sweden suggest that "the physical qualities of outdoor preschool environments" specifically their size, the presence of trees and shrubs, the proximity of play structures to vegetation "are an important trigger of physical activity" and that children take a significantly larger number of steps in play environments that are spacious and full of trees, shrubbery and broken ground.[39] Dyment and Bell also found that "when children were provided with natural landscape for play, there was a statistically significant increase in motor function, balance and coordination compared with a control group of children playing in a conventional playground."[40]

If children with increased activity levels are less likely to be overweight, and increased time outdoors corresponds to increased activity levels, then increased outdoor activity could decrease the occurrence of childhood obesity and the health problems associated with obesity.

Obesity

Children's obesity levels are rising. In 2002, David W. Orr stated that "of those under the age of 19, one-quarter are overweight or obese."[41] In the United States children run a 26.2% risk rate of being overweight between the ages of two and five.[42] The U.S. Department of Health and Human Services has determined that "prevention of childhood obesity is an urgent national health priority."[43] Exercise and healthy living are part of the plan to lower childhood obesity. But where and how will this take place? Children spend a great deal of their daily lives at school; they spend most of the year in school. School offers a prime opportunity for researching healthy activities and exercise. Where else to better teach a child about healthy living than in a place that's purpose is to learn?

Low levels of physical activity have been linked to increased chances of obesity.[44] Angela Thompson et al examines the relationship between physical activity and a healthy social, physical and mental lifestyle the benefits of which "arise from an increased energy expenditure, which contributes to more efficient body functioning, weight control, reduced risk of chronic diseases, and an overall improvement in quality of life."[45] During

Notes and Citations

46 Thompson et al (2005) pg 421

47 Thompson et al (2005) pg 429

48 Sageie and Fjortoft (2000)

49 Sageie and Fjortoft (2000) pg 83

50 as part of their daily school routine

51 Sageie and Fjortoft (2000) pg 92

52 Dyment and Bell (2008) pg 957

53 Dyment and Bell (2008) pg 960

54 Bar-Haim, Yar and Bart, Orit. "Motor Function and Social Participation in Kindergarten Children." *Social Development* (2006) pg 296

53 Bar-Haim and Bart (2006) pg 299

54 Bar-Haim and Bart (2006) pg 304

childhood people are "socialized" into becoming physically active during their leisure time.   During this time "they develop physical activity skills, attitudes, values, and behaviors."[46] People of low-income are less likely to engage in physically active leisure activities.[47] This suggests that there is a sample group that doesn't appear to have access to areas that facilitate high activity levels.

Motor Development

Access to natural play elements can improve motor-development and function.[48] This is called functional play. Children's motor fitness is improved and there is a positive result on motor abilities from use of natural playscapes and the resulting learning from exploration of space in contrast to traditional child playscapes.[49] In a test of motor development, Sageie and Fjortoft discovered that children who play frequently in naturalistic outdoor environments[50] showed a "significant difference" in balance and coordination.[51] Dyment and Bell make similar observations. They note the following:

> … when children were provided with a natural landscape for play, there was a statistically significant increase in motor fitness, balance and coordination compared with a control group of children playing in a conventional playground…[52]

The correlations between these two studies show that there is positive motor development in outdoor natural playscapes when compared with conventional playgrounds. Dyment and Bell's study suggests that "green school grounds can play a significant role in promoting physical activity" by increasing the diversity of play environments and "encouraging moderate and light levels of physical activity by increasing the range of enjoyable, non-competitive, open-ended forms of play at school."[53] More research needs to be done to substantiate the correlation between motor development and childhood outdoor play.

Correlation between Motor Development and Social Skills

Bar-Heim and Bart's study on the relationship between motor abilities and social behavior "indicates significant associations between children's motor abilities and social and nonsocial forms of play" and that "individual variations in children's motor abilities are associated with individual differences in social and solitary play behavior."[54] In general, the study concludes that children with low motor ability often experience low social play and typically play alone.[53] This may be attributed to the need for motor abilities in many of the group play activities that children initiate. Children with lower motor abilities than their peers may have a hard time dealing with the demands of a social environment.[54]

Notes and Citations

55 Bar-Haim and Bart (2006) pg 306

56 Weaver (2000)

57 Bar-Heim and Bart (2006)

58 Bar-Heim and Bart (2006)

59 Sageie and Fjortoft (2000); Dyment and Bell (2008); Bar-Heim and Bart (2006); Brown (2009)

60 Holmes, Robyn M and Procaccino, Jill K. " Preschool children's outdoor play area preferences." *Early Childhood Development and Care*. (2009) vol 179 no 8 pg 1103

61 Holmes and Procaccino (2009) pg 1105

62 Holmes and Procaccino (2009) pg 1110

63 Holmes and Procaccino (2009)

64 Nabhan and Trimble (1994) pg 66

Because indoor play in school environments tends to be more independent, children with low motor abilities tend to thrive in indoor settings; in contrast, due to the high physical activity demands of much outdoor play, children with low motor abilities find outdoor social play more difficult.[55]

William Brown et al discovered that in outdoor environments, child-initiated play was more likely. Child-initiated play is more likely to strengthen social bonds then adult-initiated play.[56] In symbolic play children with low motor abilities are less likely to participate in social play.[57] Children with higher motor skills are more likely to be socially active on the playground, while children whom have physical motor difficulties are less likely to participate in social activities, especially outside.[58] This can partially be attributed to the physical demands of outdoor play, but it may also be attributed to motor development.

There is a correlation between motor development and social development.[59] These two types of development (and play) go hand-in-hand. If social development is dependent on level of motor development, and motor development is positively impacted by increased outdoor play, then more outdoor play is necessary to begin to see a movement towards integrating less socially developed children. Children who are socially-solitary often become more solitary outdoors. Further study is needed to determine if this solitary behavior could be intercepted and prevented with earlier social experiences outdoors, perhaps what is needed is a study on younger children's outdoor social environments.

The Role of Gender

Holmes and Procaccino's found that there is a "significant effect of sex of child on choice of play space- boys preferred to play on the jungle gym and swings, whereas girls preferred the sandbox."[60] In addition, "girls typically prefer swings more than boys do"[61] and "boys preferred to play in the wheeled vehicle area more so than girls did."[62] Additional gender differences in preferences showed that boys tended to play for longer sustained periods of time than girls and girls preferred sedentary activities such as sand boxes, and both girls and boys preferred swinging activities and the jungle gym.[63] Nabhan and Trimble's study notes that on a conventional school playground girls preferred socially driven activities such as games or make-believe scenarios on play equipment which lead to social interaction. Boys on the other hand, preferred competitive activities on asphalt surfaces. In greened areas, the distinction between typical girl play and boy play was less defined and the genders were more mixed in their activities.[64] These

Notes and Citations

65 Louv (2005); Youell (2008); Staempfi (2009)

66 Dyment and Bell (2008)

studies suggest that the motor development and activity levels between girls and boys differs. More research is needed on the specific differences between genders.

Conclusion

The effects that outdoor play has on social development, motor skill development, activity level, and obesity rates illustrate the need for increased outdoor play. Because children spend a great deal of their time in educational facilities, schools offer prime locations for these activities to occur. This literature exploration is to provides a foundation for the understanding of the importance of Children's interaction with nature in terms of learning, development, and overall heath. More specifically, to examine the findings done by research studies on the effect of outdoor play on children's activity level, obesity, and motor development. From this research, it can be seen that outdoor play has a positive effect on issues of social development, motor skills, and activity level.

Other research has shown that the declining exposure and interaction of young children with nature specifically in terms of outdoor play is having a detrimental effect on children. What Louv calls "Nature-Deficient Disorder" and media-centered indoor activities are contributing the highly sedentary lives our children lead.[65] In combination with the development of television, computers, and video games children are more inclined to stay indoors than to go outside and are likely to become overweight, develop social disorders, and have poor motor skills.   Dyment and Bell's study suggests that school grounds should be greened in addition to efforts such as "increasing the amount of physical education offered, providing healthier food choices in the cafeteria, and encouraging walking and cycling to and from school" as part of a comprehensive plan to counteract the negative health and learning consequences of decreased outdoor play.[66]

Category	Benefits	Needed
Attention	therapy for chidlren with ADD and ADHD	
	increased attention levels	10 minutes for girls and 20 minutes for boys at regular intervals
	increased concentration and self-discipline	
Activity Level	positiviely correlated with decrease in obesity rates	variety of play at different activity levels
Motor Development	increased motor function	natural or greened playscapes
	increased balance and coordination	
	increased social development and interaction	child-initiated play

Table 3.1: Important Elements of Outdoor Play on Health and Learning

Notes and Citations

1 Belcher (2003) pg 4

2 Belcher (2003)

3 Belcher (2003) pg 5

Chapter 4: Playground Evolution and Design

Introduction

Children spend a substantial amount of their time at school. Some school yards offer the only outdoor playscapes that children experience on a daily basis. This is especially true for low-income inner-city children who either do not have the resources to visit alternate outdoor playscapes, or whose neighborhoods do not offer safe child-play options. Many inner-city schools are older than suburban schools and due to budget and space constraints often have the poorest outdoor facilities. Existing schools are deteriorating, school age populations are increasing, and demand for new schools is also increasing.[1] This demand for renovation and new construction provides an opportunity for designers and educational institutions to work together to create playscape environments that are conducive to childhood health, learning, and natural experiences. Currently, student's time spent outdoors in school yards is often limited.[2] As discussed in the previous three chapters, outdoor play has health, motor development, social, and attention benefits. Outdoor play also has the ability to provide children with experiences in natural landscapes which can assist children in creating an environmental consciousness which could impact their adult morals and values. Schools are places of learning, school yards also have the ability to teach children and act as a safe-haven where parental concerns for safety and risk do not inhibit play.[3]

School yards evolved as theories on playground design changed to address research on childhood learning and play. From 19th century playgrounds that aimed to socialize lower-class children through exposure to higher-class children and adult behavior, to twenty-first century experiments in imagination playgrounds, child playscapes have been on the cutting edge of research in child development and play. This chapter illustrates the evolution of the playground in the United States with some references to playground innovations in England and Scandinavia. Through understanding how playgrounds have evolved as research on play and child development has changed it may be possible to find moments of weakness and benefits in each type of playscape.   The table following this chapter outlines the similarities and differences in each playground type. By correcting these weaknesses and utilizing benefits in future playground design it is possible to incorporate natural elements and encourage childhood experiences in nature as well as increase physical activity levels and motor development.

Notes and Citations

4 Gamble, James C. "Evolution of the Park: Why the Playground is the Heart." Land Design Collaborative, Inc. (2006) *Elevation: Park and Recreation Design Issue.* Newsletter of the Illinois chapter of the American Society of Landscape Architects <http://www. landdesigncollaborative.com/new/ newsArticle2.htm>

5 "Historic Facilities." *City of Oakland: Parks and Recreation.* (2010) <http://www.oaklandnet. com/parks/inside_oakland/historic-facilities.asp>

6 "Playgrounds in Parks." *New York City Department of Parks and Recreation.* (2010) <http://www. nycgovoarks.org/sub_about/parks_ history/playgrounds.html>

7 "Playgrounds in Parks" (2010)

8 ed. Davis, Allen F. and Mark H. Haller. *The Peoples of Philadelphia: A History of Ethnic Groups and Lower-Class Life, 1790-1940.* University of Pennsylvania Press: Philadelphia. (1973)

9 "Playgrounds in Parks" (2010)

10 "Playgrounds in Parks" (2010)

11 "Playgrounds in Parks" (2010)

12 "Playgrounds in Parks" (2010), Image rights: New York City Department of Parks and Recreation, pre-1923.

13 "Playgrounds in Parks" (2010)

Traditional Playgrounds

In the late 19th and early 20th century playgrounds consisted of hardwood play pieces such as swings, balance beams and ladders.[4] These early playgrounds served as neighborhood centers[5] and were designed so that children of underprivileged families could experience the high social standards of the upper-class in an effort to teach "social morality" through supervised programed activities.[6] At the time, many playgrounds were developed in response to the creation of child labor laws which limited the time children could spend at work, the types of work children could do, and set age restrictions. These playgrounds were an effort to improve the quality of life for children in inner-city districts and to improve behavior of children in lower-class families.[7] Many upper-class elites were noticing child behavior problems in lower-class children what they believed were negatively influencing the behavior of upper-class and higher-income children.[8] It was their belief that lower-class children could be taught how to behave morally if they were shown by upper-class children.

Many urban children only experienced outdoor play in streets, alleyways, and vacant lots.[9] Public schools in major urban areas during the late 19th century were some of the first playscapes designed specifically for children in the United States.[10] Before public parks began to include playgrounds, most "play areas were built by private philanthropic organizations and the public education system."[11]

Figure 4.1: Large Pavilions surrounded by open space (often concrete, asphalt, grass or dirt) were common in early playgrounds. This playground is located in New York City.[12] [Public Domain]

Early playground equipment was largely constructed out of metal and wood to create minimal play structures which were in the midst of large expanses of concrete or grass used for running and group games.[13]

Notes and Citations

14 "Playgrounds in Parks" (2010)

15 "Playgrounds in Parks" (2010)

16 Gamble (2006)

17 Also called Jungle-Gyms

18 Gamble (2006)

19 Gamble (2006)

20 "Eddison Students- 1918: Weekly *Moment in Time* Column." *Grandview This Week Newspaper.* (2006) <http://www.ghmchs.org/ thisweek/photo-listing6.htm>

21 "Historic Facilities" (2010), Image rights: *Grandview This Week Newspaper* pre-1923

Often these playgrounds included a permanent pavilion for mothers to gather with younger children.[14] These playgrounds were often crowded with large numbers of school-age children and void of vegetation.[15]
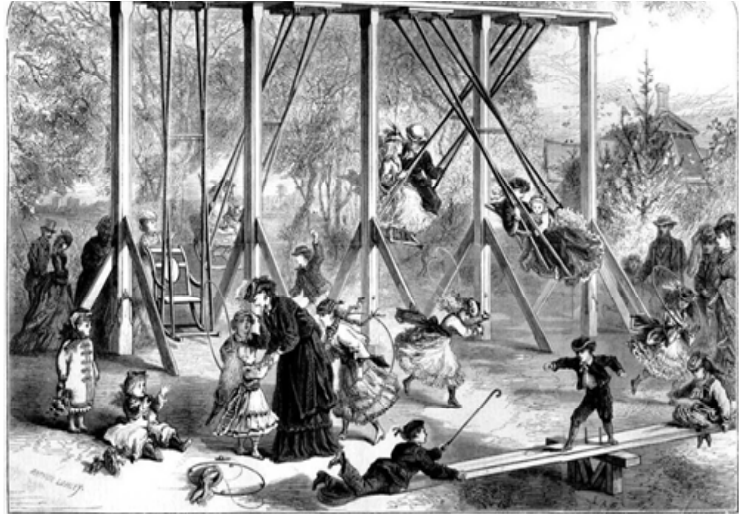
Figure 4.2: An example of a traditional playground of the late 19th century. Wooden structures for swinging were typical playground pieces.[16] [Public Domain]

Around 1920 playground equipment began to include "Jungle Jims"[17] used for climbing and constructed from metal pipes.[18] This innovation soon lead to the development of steel climbers, swings, and pre-developed play structures.[19] In addition, sand boxes and fences were a common addition to playgrounds of the 1920s.[20]

Figure 4.3: The Grandview Elementary School Playground in Oakland, California in 1918 shows early metal pipe swings with a wooden encased sandbox. This is a typical school playground in the early 1900's.[21] [Public Domain]

Notes and Citations

22 "Playgrounds in Parks" (2010), Image rights: New York Department of Parks and Recreation pre-1923

23 "Playgrounds in Parks" (2010)

24 Gamble (2006); Staempfli (2009) pg 269

25 "Playgrounds in Parks" (2010)

26 "Playgrounds in Parks" (2010)

27 "Playgrounds in Parks" (2010)

28 Gamble (2006); Staempfli (2009)

Figure 4.4: The first West Oakland municipal playground used as a community center opened in 1910. This shows the typical metal and wooden frames used in playground equiptment.[22] [Public Domain]

Playgrounds of the late 19th and early 20th century showed society's desire to provide children with social environments in which to play and develop moral behaviors.[23] These playscapes provided only the most basic play equipment and encouraged large groups of children to play in vast open spaces. Concern over types of play, exposure to nature experiences, and physical development were not expressed due to the primary concern for social improvements and improvement of quality of life for working children. The objective of traditional playground design was social improvements. After World War I when American playground development began to include innovative ideas of creative play such as building materials for children to construct their own playscapes.

Adventure Playgrounds

After World War I much of Europe was physically devastated. Cities lay in ruin and funding for rebuilding for children's playscapes was difficult to find. A new playground concept discovered by children in England and Denmark addressed the need for childhood outdoor play and the deteriorated urban environment. This new playground was called the "junk playground."[24] Junk playgrounds were typically spontaneously created by children in vacant or abandoned lots and allowed children to use spare construction materials to build, destroy and rebuild a playscape of their own creation.[25]

By the mid-twentieth century playgrounds, and parks and recreation departments were common in most United States cities.[26] Junk playgrounds did not become popular in the United States due to safety concerns.[27] Eventually junk playgrounds evolved into what is now called Adventure Playgrounds.[28] These playgrounds were

Notes and Citations

29 Willis, Ray. "Child's Play History." The gypsy poet- journey into the land of freedom. (2009) < http://www.thegypsypoet.co.uk/childs_play_and_their_history_4.html>

30 "Playgrounds in Parks" (2010)

31 "Playgrounds in Parks" (2010)

32 "Playgrounds in Parks" (2010)

33 "Playgrounds in Parks" (2010)

found materials to construct their own playscapes, but they often addressed parental safety concerns by providing adult supervision and restricted access to construction materials and surfaces. It was not until the 1960s that the U.S. parents and children became interested in implementing adventure playgrounds.

Figure 4.5: Junk Playground of the mid 1900s in London, England.[29] [Public Domain]

The primary difference between U.S. adventure playgrounds and the junk playgrounds of Europe was that playgrounds in the U.S. "did not make use of raw building materials" due to federal safety standards and instead utilized specific materials considered "safe" by policy makers and parents.[30] Instead of "found" materials such as used nails, broken wooden boards, and pre-used construction materials from destroyed buildings, U.S. adventure playgrounds provided wooden structures, natural playscape materials such as sand, and the ability for children to move parts around. Adventure playgrounds often were deigned with "natural materials to integrate the play area into the land itself."[31] In addition, colors were muted and structures were blended between cast concrete and natural materials "such as ropes and large-size timbers."[32] By the 1970s safety concerns caused the retrofitting of many adventure playgrounds with more contemporary materials and surfaces to eliminate the risk of child injury.[33]

Adventure playgrounds address issues which were not addressed in traditional playgrounds. Where traditional playgrounds only offered programed play in supervised environments focused on social development, adventure playgrounds offer children the ability to experience construction play. Construction play also offers a variety of physical and social development which traditional playgrounds did not. Children using adventure

Notes and Citations

34 "Adventure Playground." Parks, Recreation, & Waterfront: the City of Berkeley, California. <http://www.ci.berkeley.ca.us/contentdisplay.aspx?id=8656>

35 Holmes and Procaccino (2009) pg 1104

36 Staempfli (2009) pg 268-269

37 "Playgrounds in Parks" (2010)

38 Barovick, Harriet. "Building a Better Playground." *TIME* (August 2010)

playgrounds have the ability to work together to cooperatively solve problems as well as explore the physical demands of building their own playscape. In terms of nature experiences, adventure playgrounds also offer children exposure to natural elements which traditional playgrounds did not incorporate.

Figure 4.6: Adventure Playground was opened in 1979 in the City of Berkeley, California as part of the Marina Experience program.[34]   [Public Domain]

A new era of adventure playgrounds has emerged since 1990 which has invigorated interest in child-constructed playscapes. Modern adventure playgrounds are still "constructed from the natural environment" and children still "actively construct their own play space using available materials" but in a controlled and supervised environment unlike previous adventure playgrounds.[35] According to Marianne B Staempfli who conducted research in Canada on adventure playgrounds and Children's outdoor play environments, adventure playgrounds "provide a means for positive risk development and healthy lifestyle choices."[36] While adventure playgrounds are still not widely accepted in U.S. playground design by parents and parks and recreation departments, they have inspired a new type of playground design that is becoming increasingly popular especially in densely developed urban neighborhoods. This new type of playground is called the Imagination Playground.[37]

Imagination Playgrounds

Imagination playgrounds utilize many of the ideas of adventure playgrounds, but are mostly made with a mixture of prefabricated materials that can be moved to The Imagination Playground provides movable play materials and permanent play equipment under the supervision of "play associates" whom have been trained in child and equipment safety.[38]

Notes and Citations

39 Barovick (2010) pg 46

40 Barovick (2010)

41 "Imagination Playground." *play associates* (2010) < http://imaginationplayground.org/photos/>

42 "Playgrounds in Parks" (2010)

43 "Playgrounds in Parks" (2010)

44 Gamble (2006)

Barovick discusses growing interest in the use of moveable parts on playgrounds called Imagination Playgrounds. One such example of an Imagination Playground is in New York City, ironically called the Imagination Playground. The Architect worked with the nonprofit playground design company Kaboom to develop large moveable blue blocks which were "deliberately big so kids will be more likely to assist each other with them."[39]

Similar to European adventure playgrounds "where supervised kids can get creative with a wide variety of objects, follows the prevailing [play] theory that free, child-initiated play is a critical component of healthy social, emotional and intellectual development."[40] Supervision is important on this type of playground to ensure that movable pieces don't leave the site, to make-sure play equipment isn't mistreated, and that children are playing safely. Adult supervision in imagination playgrounds so additional funds are needed to pay supervisors. New York City has used a mixture of public and private funds to pay play associates while other cities with Imagination Playgrounds have relied on volunteers and/or grants.[41]

Another innovative way that playground equipment companies are addressing the increased demand for child constructed playgrounds is to create interchangeable parts which can be used on any number of playgrounds sites. The Rockwell Group called this "Imagination Playgrounds in a BOX."[42] This concept "places Imagination modules in" numerous sites and kits include a variety of loose parts which can be assembled into countless forms and then de-constructed and stored on site.[6] Often these loose parts include foam blocks, sand/water tools, tarps, and fabric.[43]

Imagination playgrounds address many of the same issues as adventure playgrounds but in a more programed way. In some ways the pre-construction of play elements can deter some of the creative social interactions, physical development, and innovative thinking that adventure play fosters. This is a trade-off for improved safety and parental security.

Contemporary Playgrounds

Contemporary Playground design began in the late 1950's at the same time as adventure playgrounds. Playground designers began integrating manufactured equipment with site-unique design. Much of early contemporary playground design included artistic sculptural elements designed for specific playground sites.[44] By the 1970s when playground standards for safety were becoming more stringent, uniquely designed elements was replaced by increased use of manufactured playground elements which were pre-approved for safety and

Notes and Citations

45 Gamble (2006)

46 Gamble (2006)

47 Holmes and Procaccino (2009) pg 1104

48 "Playgrounds in Parks" (2010)

49 O'Brien (2009)

50 O'Brien (2009) pg 45

51 O'Brien (2009) pg 47

52 O'Brien (2009) pg 47

53 O'Brien (2009) pg 50

54 O'Brien (2009) pg 50

accessibility. This shift was due to increased demand for children with disabilities to utilize public education playgrounds and other public playscapes.[45] Contemporary playgrounds typically utilize plastic and metal play structures which include slides, climbing structures, and swings sited on impact absorbing play surfaces.[46]

Holmes and Procaccino claim that "contemporary playgrounds can be viewed as improved traditional playgrounds."[47] Contemporary playground design is constantly evolving as playground equipment companies develop new and improved materials and structures. Since the 1980's, playground designers have become more focused on utilizing "local culture, geography, and history" of individual neighborhoods to create a relationship between playground and place.[48]

Forest Schools

One of the most inventive ways that schools are addressing evolving playground design and the lack of vegetation in playgrounds is the creation of forest schools. While public schools often offer standard playground structures, forest schools are utilizing unique opportunities for outdoor play.

Forest Schools integrate access to woodland play into the daily curriculum for students.[49]   O'Brien describes Forest Schools as an "inspirational process that offers children, young people, and adults regular opportunities to achieve and develop confidence and self esteem though hands on learning in a woodland environment."[50] Primarily, these schools focus on "learning by doing"[51] and incorporate these principles:

- Focus on learning, not performance

- See learners as co-curriculum developers, allowing learners to shape their own meanings and knowledge

- The teacher/student relationship is built on guidance not instruction

- Tasks are "seen as ends in themselves and" have "implicit worth"[52]

Studies done on Forest Schools in Surrey, United Kingdom show that woodland learning can "increase self esteem and confidence, improves social skills... improve motivation and encourage concentration... [and] improve physical motor skills."[53] In addition, a "ripple effect" occurs when children tell family and friends about their experiences.[54] Research on Forest Schools and woodland learning support the idea that children's senses will be better stimulated in a natural area than in traditional playscapes.

The opportunities for interaction with nature that each individual schools can offer vary depending on

funding, community involvement and interest, and location. The Forest School concept illustrates alternate types of school grounds that allow for natural learning. Even though these approaches are not widely implementable in the United States due to federal and state restrictions on public education, elements of Forest School learning can be retrofitted into standard public education. Elements such as access to woodland recreation through recess, physical education, or field trips, and student based learning that allows children to learn and grow academically based on their own interests can be integrated into public education curriculum.

Forest Schools offer a greater amount of free, child-initiated play than traditional, contemporary and imagination playgrounds. A drawback however is the inconsistency between Forest Schools. This raises the issue of school siting. Not only does the designed environment of the school yard matter, but the location of the school does also. In order to incorporate many of the elements of the Forest School approach, schools must be sited near forested areas so that children can have immediate access to an undeveloped natural environment.

Conclusion

School yards have evolved as theories on playground design have changed to address research on childhood learning and play. From 19th century playgrounds which aimed at socializing lower-class children and teaching them societal values to the 21st century experiments in Imagination Playgrounds, child playscapes have remained on the cutting edge of research in child development and play. By understanding how playgrounds have evolved as research on play and child development has changed it is possible to find elements in each type of playscape which can be incorporated into future playground design in both an effort to incorporate natural elements to encourage childhood experiences in nature and to an increase physical activity levels and motor development.

Because children spend a substantial amount of their time at educational facilities, school yards can offer children opportunities to play and learn outside which many low-income children would not otherwise have. While many inner-city schools do not have the funding to experiment with alternative playscape types such as those at the Forest Schools in the United Kingdom, these schools do have the opportunity to integrate some of the natural learning techniques seen in Forest Schools, adventure playgrounds and imagination playgrounds. The tables following this chapter illustrates the shared and different characteristics of each type of playground. Because children's time outdoors is often limited outside at public schools, time spent should allow children to

experience as much of the natural environment and experimentation with nature as possible. These few experiences could go a long way to promoting children's future environmental consciousness.

Traditional playgrounds often contain large expanses of turf and asphalt that limit opportunities for different types of activities. These playgrounds also limit the amount of physical activity by only offering limited play structures such as swings, balance beams and ladders. Lack of vegetation in traditional playgrounds limits the amount of natural experiences that these playscapes offer. Similarly, conventional playgrounds often offer only manufactured equipment in clusters on mulch or other prefabricated surfaces. While conventional playgrounds are improvements to traditional playgrounds, they still lack the variety of spaces and inclusion of vegetation which encourage a wider range of play and experiences in nature. Adventure playgrounds and imagination playgrounds fill in some of the gaps in opportunity where traditional and conventional playgrounds are lacking, but still do not address all of the areas needed to promote a variety of types of play and opportunities for natural experiences. Forest Schools allow children freedom in play and physical experiences in nature, but have a greater requirement for school siting, making retrofitting existing schools impossible.

What is needed is a combination of these types of playgrounds which addresses needs for a variety of types of play, social interactions, physical development, and interaction with nature. Constructed green playgrounds can fill this purpose. Through incorporation of the social play typical of traditional playground design, construction play of adventure playgrounds, integration of prefabricated elements designed for physical development in contemporary playgrounds, and nature experiences in Forest Schools, constructed green playgrounds can offer children the highest amount of development and health benefits, a variety of play types, and the opportunity to foster natural experiences.

Playground Type	Equipment	Primary Purpose	Problems	Benefits
Traditional playgrounds pre-1920s	Hardwood play pieces: swings, balance beams, ladders	Improve quality of life for working children, teach lower-class children moral behavior	over-crowding, not enough designated activities for children, no vegetation for sun/heat protection, no opportunities for free-play, all interactions were programmed by adults	adult supervision
Traditional playgrounds post-1920s, pre-WWI	Metal piping and pre-developed play pieces: jungle-jims, steel climbers, swings, fencing, sandboxes	Provide children with social experiences and structure social interactions	over-crowding, few play structures for large numbers of children, no ability to creatively play, still adult programmed, only some opportunity for free play	integrated play pieces for different physical activity levels and different types of interaction
Traditional playgrounds post-WWI	Metal piping and pre-developed play pieces: jungle-jims, steel climbers, swings, fencing, sandboxes; Creative play: found building materials for child construction	Provide children with social experiences	over-crowding, few play structures for large numbers of children, often	allowed children greater freedom in play, spaces for construction play

Table 4.1: Comparison of Traditional Playgrounds

Playground Type	Equipment	Primary Purpose	Problems	Benefits
Junk playgrounds	found construction materials	provide children with playscapes after WWI	Often viewed as unsafe due to probability of injury from construction	allowed children to create their own spaces
Adventure playgrounds post-1960s, pre-1990s	Wooden structures, specific materials for children to move around, cast concrete, ropes, timbers	allow children the freedom to build without safety hazards	limited the amount of creativity for building, rarely included vegetation as building material	allowed children to create their own spaces, provided a safer environment for play than Junk playgrounds
Adventure playgrounds post-1990	wooden structures, sand areas, ropes, timbers, materials for children to build with	allow children to construct their own landscape with adult supervision	Adult supervision stifles some creativity, limited vegetation for building, didn't allow for children with handicaps	Adult supervision satisfied parental safety concerns, children able to create their own playscape, integration of some natural elements
Imagination playgrounds	Pre-fabricated moveable parts that can be stored on site or moved off-site; stationary structures: sand areas, water features, play surfaces, and climbing features; loose parts: foam blocks, fabric, tarps	Allow children to experiment with materials and construct their own playscape under adult supervision and instruction	need additional funds to pay adult supervisors, need containers to hold movable parts	use of a variety of elements to create diverse stimuli, children able to create their own playscape, adult supervision provides safety, integration of some natural elements

Table 4.2: Comparison of Junk, Adventure and Imagination Playgrounds

Playground Type	Equipment	Primary Purpose	Problems	Benefits
Contemporary playgrounds post-1970s	some site-specific design elements with mostly pre-fabricated manufactured equipment, handicap-accessible play equipment	create a playground within a geographical context, artistic elements	lack of vegetation, more expensive due to individual design, lacks creative play elements	mostly free-play and child-initiated play, addresses geographical context and local needs, integrates manufactured and site specific elements, addresses all children's physical ability levels
Forest school yards	Woodlands and naturally occurring landscape elements	hands-on learning in woodlands	Not widely implementable, doesn't include play equipment	utilized natural landscape, in natural-process driven, provides natural experiences

Table 4.3: Comparison of Contemporary Playgrounds and Forest Schools

   Tables 4.1, 4.2, and 4.3 chart the similarities and differences between each of the playground types discussed in Chapter 4: Playground Evolution and Design. Changes in equipmenttype, playground purpose, benefits, and problems show that each stage in playground design attempted to address different types of play, development, and experiences. These findings are combined with the findings in Tables 4.4, 4.5 and 4.6 to create a set of design guidelines (see Chapter 5: Design Guidelines).

Playground Type	Programmed Play	Free Play	Natural Play	Constructed Play	Greened Play
Traditional playgrounds pre-1920s	heavy			light	
Traditional playgrounds post-1920s, pre-WWI	heavy	light		light	
Traditional playgrounds post-WWI	heavy	moderate		moderate	
Junk playgrounds		heavy			moderate
Adventure playgrounds post-1960s, pre-1990s		moderate		moderate	moderate
Adventure playgrounds post-1990	light	moderate		moderate	moderate
Imagination playgrounds	moderate	moderate		moderate	light
Contemporary playgrounds pre-1970s	light	heavy		heavy	light
Contemporary playgrounds post-1970s	moderate	heavy		heavy	light
Forest school yards		heavy	heavy		

Table 4.4: Types of play offered by playground type

Playground Type	Nature Experiences
Traditional playgrounds pre-1920s	
Traditional playgrounds post-1920s, pre-WWI	
Traditional playgrounds post-WWI	
Junk playgrounds	light
Adventure playgrounds post-1960s, pre-1990s	light
Adventure playgrounds post-1990	moderate
Imagination playgrounds	light
Contemporary playgrounds pre-1970s	
Contemporary playgrounds post-1970s	
Forest school yards	heavy

Table 4.5: Nature experience offered by playground type

Playground Type	Increased Attention	Varieties of Activity Level	Social Development	Motor Development
Traditional playgrounds pre-1920s	light		heavy	
Traditional playgrounds post-1920s, pre-WWI	light	light	heavy	light
Traditional playgrounds post-WWI	light	moderate	moderate	light
Junk playgrounds	moderate	light	light	moderate
Adventure playgrounds post-1960s, pre-1990s	moderate	moderate	moderate	moderate
Adventure playgrounds post-1990	moderate	heavy	moderate	heavy
Imagination playgrounds	moderate	moderate	moderate	heavy
Contemporary playgrounds pre-1970s	moderate	moderate	moderate	heavy
Contemporary playgrounds post-1970s	moderate	moderate	moderate	heavy
Forest school yards	heavy	moderate	light	moderate

Table 4.6: Health benefits offered by playground type

Tables 4.4, 4.5, and 4.6 rate the level of opportunity for type of play, nature experience, and health benefits offered by each type of playground. A ranking of "light" signifies very little potential for benefit, "moderate" signifies some potential for benefit, and "heavy" signifies the greatest potential for benefit. The type of playround purpose, equiptment, benefits, and problems were examined (based off the finding in Chapter 4: Playground Evolution and Design and Tables 4.1, 4.2, and 4.3). Through understanding these potential benefits design guidelines can be developed for the creation of constructed greened playgrounds which address a range of play types, physical and social development issues, and create opportunities for nature experiences (see Chapter 5: Design Guidelines).

Notes and Citations

1 Staempfli (2009) pg 274

2 Sobel (2008) pg 20

3 Sobel (2008)

Chapter 5: Design Guidelines

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Introduction

Using the information gathered about play, nature experiences, health and development, and playground evolution this set of guidelines has been developed to improve playground and play-program design. This chapter concludes with a set of tables outline the importance of each guideline within the context of play, nature experiences, health and development, and playground evolution. A table outlining each guideline is also included at the end of this chapter.

Play

Constructed playscapes have recently fallen short of school-aged children's needs by failing to integrate constructed garden and natural areas, offering constructive play materials, and providing spaces for symbolic play.[1] Through specific design interventions this failure can be mitigated and constructed playscapes can offer similar benefits to natural playscapes. Diversity of sensory experiences provides children with the stimulation needed to foster creative learning. The sensory experiences which should be are sight, sound, smell, taste, and touch. Diversity of physical structures and elements are also important in these design interventions. Specific physical elements include vegetation, topography and structures.

Sobel suggests that there are seven main "play motifs" which need to be considered when helping to foster childhood play in nature: the making of special places or forts, hunting and gathering, creating miniature worlds, animal friendships, making adventures, getting lost in fantasies, and discovering paths and short cuts.[2] Based on these seven "play motifs" there are seven principles for designing children's play interactions with nature: Adventure, Fantasy and Imagination, Animal Relationships, Maps and Paths, Special Places, Small Worlds, and Hunting and Gathering.[3] Using these seven themes for play specific elements of design can be derived.

Moments of Mystery

Adventure play speaks to children's need to explore their own physical boundaries and abilities. Physical play not only has the ability to increase motor function and activity level in children, but also can help to develop social relationships especially on school grounds. In addition, Adventure play allows children to push the boundaries of their own abilities through experimentation with new physical challenges. This type of play is encouraged through the incorporation of opportunities for exploration. These opportunities can be called

Notes and Citations

4 Sobel (2008) pg 26

5 Sobel (2008) pg 39

Moments of Mystery.

Paracosms

Fantasy and Imagination speaks to children's ability to get lost in a world of their own creation. This includes dramatic play where children live within their own imagination. Many famous authors claim that it was their fantasy and imagination play which lead to the creation of the worlds within their books. Called "paracosms" these imagined worlds are created and developed throughout childhood. C.S. Lewis's Narnia as well as Jane Austen's world of Jane Eyre and Wuthering Heights was created in this fashion.[4] Paracosms can be encouraged in a number of ways which are already widely accepted in playscape design.   While some children can create these fantasy worlds without the encouragement of physical forms, some children need physical forms to develop imaginative thinking. Play structures designed to look like specific objects, such as pirate ships, castles, or houses, have the ability to assist those children who do not have the natural talent of paracosm creation.

Wildlife Interactions

Animals can play a significant role in children's interaction and connection to a playscape. Through the development of relationships with specific animals children can become more inclined to participate in the preservation of a natural landscape, and are more likely to revisit a playscape throughout childhood.   The emotional development that is derived from caring for an animal encourages children to care also for the larger ecological and biological world. Petting zoos, and dog parks are the most common types of these landscapes, but not all playscapes can incorporate animal life interaction opportunities. There are a number of other options for children to develop a relationship with wildlife on playscapes without access to animal life. The incorporation of plants which attract insects- such as butterflies, caterpillars, and grasshoppers- or small creatures- such as squirrels, chipmunks, and rabbits- or even the incorporation of trees which attract bird life can be incorporated into any child playscape.

Unfortunately, a common deterrent of wildlife interaction is the "Don't Touch Policy" which many adults and facilities enforce. The "Don't Touch Policy" assumes that nature is fragile and can be harmed by interactions. This policy often discourages children to have a physical interaction with wildlife under the fear that they will accidentally damage or destroy the natural element they are interacting with.[5] One of the most important elements of this type of design intervention is the incorporation of parental education which encourages adults to allow children to touch wildlife. Small placards within the playscape which give brief descriptions, pictures and

techniques for handling of wildlife can serve this purpose.

Creation of Connections

Children are constantly trying to understand their surroundings and relationships between elements within their environment. Sometimes this takes the form of the creation of mental maps and the exploration of paths between key elements. These paths can partially be designed into children's playscapes. By designing a series of spaces within the landscape which can act as landmarks, and through the incorporation of multiple paths- varying paved paths, hidden paths though vegetation, or visual paths- between landmarks children have the ability to design their own journey through spaces. What becomes important here is the ability for each child to create their own mental map of the playscape based on their own exploration and personal preferences.

Elements for Manipulation

Special Places and Small Worlds are different in their purpose, but similar in their physical implantation. Children enjoy playscapes where the loose parts and pieces within the environment can be used and manipulated to create unique spaces. These special places are private creations which children have ownership over because of their role in the creation of that space as a special place. Early and middle childhood is marked by the use of these special places- unique to each child- to create small worlds. An example of the creation of small worlds within special places is the use of the inside of a large bush as a "hide-out" where "treasures" (branches, sticks, rocks, etc) are hidden. In this way, the bush serves as the child's special place where he or she is keeping important elements of play which are incorporated into an imaginary world of the child's creation. Another method of encouraging this type of ownership and creation of place is though manipulative objects such as those in Imagination and Adventure playgrounds.

Things to Collect

The ability to find and collect elements which have individual meaning is important in developing a relationship between the child and the playscape. Gathering rocks, colorful leaves, unique sticks, or insects is a common manifestation of hunting and gathering during play. Through the use of many different shapes, textures, colors, and objects designers can encourage children to collect specific elements. Another method of encouraging hunting and gathering is through the designed "treasure hunt" through the use of a series of plaques within the playscape which describe objects for children to find and collect within different areas. In this way, children not only have the adventure of finding these elements,

but also have the mental exercise of mapping and creating paths between the elements and the ownership over the actual collection of elements.

The physical elements within a playscape are important for encouraging types of outdoor play which facilitate childhood relationships with nature. Creating moments of mystery encourage children to push the boundaries of their physical abilities. Paracosms, wildlife interactions, the creation of connections, elements for manipulation, and things to collect all assist in facilitating children's connection to nature through ownership and individual exploration.

Natural Experiences

Not only are the physical elements important in encouraging childhood play in nature, but the age at which this play takes place is also very important. Many researchers have determined that the ideal age for children to experience nature is in early-middle childhood. During this developmental time-frame there is a moment or a series of moments which creates a lasting impression on the child's environmental identity.[1] A child's individual experiences with nature are important. It is the ability to explore the natural world alone that leads children to creating understandings about their relationship to the natural world. Below are suggestions for creating individual experiences in nature during early-middle childhood:

- Take children hiking and allow then to explore while touching, smelling, and feeling the world around them

- Take children camping

- Let children play in the mud

- Allow children to climb trees

- Let children pick flowers

- Encourage children to collect natural items like pinecones, rocks, or leaves

Adult and Child Groups

Because social groups have a significant impact on environmental identity it is important for children to have access to groups which encourage environmental thinking and awareness. Because adult beliefs and values greatly shape childhood values it is important for adults to be involved as well. Below is a list of types of groups which adults and children can become involved in that advocate for environmental action:

- Religious groups: many religions encourage environmental consciousness.

- Community programs: neighborhood greening

Notes and Citations

6 Bixler and Floyd (1997) 464

7 Sobel (1996)

groups, trash pick-up groups, or adopt a road groups

-        National organizations: Wilderness Society, Sierra Club, etc.

-        Local organizations: zoo clubs, recreation center clubs, etc.

Social Experiences

Because children spend a substantial amount of time among their peers at school, this location offers an ideal place to advocate for these social groups. Bixler and Floyd suggest that "outdoor programming for youth, whether educational or recreational, must demonstrate the rewards of being in wildlands while helping apprehensive individuals make appropriate interpretations of any unpleasant attributes."[6] In addition, giving children something to manage and have ownership over helping with encourages children to participate in groups.[7] Below are suggestions for children's groups at school which can teach children about nature and also provide them with interactions in nature:

-        Science clubs: either after or before school programs can meet weekly or biweekly to do experiments and explore scientific phenomena

-        Recycling clubs: Schools can provide recycling stations where students and teachers can deposit the recyclable goods that have been used at school (such as paper, water bottles, cardboard from packed lunches, etc). Students who are members of the club can then take these recyclables to a recycling center monthly as a field-trip.

-        Nature groups: These groups can either meet during science class during the school day or can meet after school. Specifically nature groups can be put in charge of helping to care for the plants around the school.

Wildlife Interactions

Experiences with other living creatures also play a critical role in the creation of an environmental identity. Because children's folk theories are created through understandings of nature based on living and non-living, it is important for children to be exposed to a wide range of living and non-living stimuli. Specific examples of ways to create interactions between children and other living creatures include:

-        Butterfly gardens: where children can watch butterflies, learn about their habitats and lice cycles, and have the ability to catch, touch, and release butterflies

-        Zoos: can be either petting zoos where children can feed and touch animals, or larger animal zoos where children can observe animal activities

-        Household pets: allow children to form bonds with a specific animal through daily interaction

- Classroom pets: encourages children to care for and maintain an animal in a social environment

- Dog parks: where children can watch how dogs interact with each other and their owners

- Bird watching areas: encourage children to look-and-find specific types of birds and lets them see their different lifestyles (nests, eating habits, habitats, etc)

- Plants which attract wildlife: trees with berries attract birds, butterfly bushes attract honey bees and butterflies, and flowering plants attract humming birds. In addition plants which encourage rabbits, groundhogs, and other small animals can be planted where children will be able to observe animals.

Urban Experiences in Nature

Children in rural areas have different experiences than children in urban areas. Rural children are more likely to see the world biocentrically because they have more access to natural elements which are uninfluenced by human need, whereas urban children are more exposed to human-dependent natural phenomena. A combination of biocentric and anthropocentric thought is critical to the creation of an environmental identity which treats nature as valuable. Because urban children are more likely to see nature anthropocentrically, it is important to provide experiences which could also lead to biocentric thought. Below is a list of ways to equalize urban and rural childhood experiences:

- Nature parks: Areas within the city that are "non-human" and include only natural elements such as grasses, trees, flowers, water features (such as creeks), rocks, and elements that simulate a truly natural environment

- Parks near urban residential areas: This allows children to access specific outdoor areas on a daily or weekly basis creating a continued relationship between child and place

- Butterfly gardens

- Zoos

- Backyard gardens, roof-top gardens, or balcony gardens: allows children to grow and care for their own nature

Community Action

Public activism can also play a critical role in shaping the environmental identities of children. There are a number of actions that local community members can do to help encourage childhood experiences in nature:

- Ask our kids to tell us about their experiences outdoors

- Explore natural areas with children

- Seek to influence planners and decision makers

- Fight for loved outdoor places

- Petition parks and recreation departments for more facilities and greater quality spaces

- Organize groups of parents and children for outdoor experiences

- Limit the amount of time spent indoors and at media-centered activities

- Encourage nature reserves

- Advocate for environmental education programs

- Establish kid-friendly green corridors

- Designate specific outdoor areas as environmentally important and work to preserve them

Health, Attention, and Motor Function

Increased academic demands have resulted in the lessoning of recess time spent at school. Recess time has a positive correlation with attention levels suggesting that children need recess in order to learn more attentively. The ideal length of time for recess is between twenty minutes (for boys) and ten minutes (for girls). Instead of offering one large chunk of recess and decreasing the total amount of recess time offered during the school day, schools should allocate recess in twenty minute intervals throughout the school day. By allowing children consistently spaced breaks throughout the day they will be more likely to refocus on learning.

Green Existing School Grounds

Greened school grounds offer greater health and learning benefits than conventional school grounds. This can be achieved through additional vegetation and ground elevation changes. In addition, the inclusion of specific elements can increase opportunities for environmental education. These are as follows:

- Edible plants: Berry bushes (blueberry, blackberry or raspberry bushes), herbs (parsley, thyme, chives, cilantro, basil, rosemary, etc), fruit trees (orange, grapefruit, peach, apple, etc), vegetables (green peppers, tomatoes, carrots, corn, etc), and roots (ginger, potatoes, sweet potatoes, etc)

- Plants for Art: Some plants can be cut into stamps or used as stencils for art projects. In addition, a variety of plants with different types of leaves can be used for tracings and dried leaf projects.

- Flowering plants: different colors, shapes and sizes of flowers as well as flowers that bloom at different times

-        Seasonally changing plants: These plants offer different educational experiences during different seasons. Plants such as sunflowers offer summer blooms and fall to winter seeds.

-        Topography changes: Rolling hills, earth mounts, and rock faces encourage children to climb, run, roll, and slide

Activity Level Areas

To encourage activity at different levels, it is important to offer a variety of playscape options. This for competitive sports-related or high activity level play but also areas for less vigorous medium activity level play such as ball throwing, jump-roping, climbing, and hop-scotch as well as low activity level play like fantasy and dramatic play. This can be achieved by offering smaller confined areas for low-level play, large open spaces and paved areas for high-level play, and specifically designed areas for specific activities (such as four-square or basketball).

Child-Led Activities

Child led activities tend to be more active than teacher or adult-led activities. For this reason children should be allowed to lead their own activities in addition to have activities orchestrated by teachers. Suggestions for encouraging children to lead their own activities are as followed:

-        Provide ample space for multiple child groups: younger children prefer spaces for only a few children to gather while older children often prefer larger spaces where many children can play.

-        Create clusters of spaces

-        Encourage specific types of child-led activities through design: this can include designed areas for games like four-square, or designed areas which resemble specific things (pirate ships, castles, etc).

The Role of Schools

School can also provide the environmental education needed to help guide children's understandings about nature. This education should not only happen in conjunction with direct experiences outdoors, but should also be developmentally appropriate. Children in early-middle childhood often have a narrow scope of understanding and are incapable yet of contextualizing smaller environmental issues into the context of world environmental problems. For this reason interventions in education should be limited to individual child interests and the developmental capability of the child. Suggested environmental education interventions are below:

-        Teach locally important subjects within broader

Notes and Citations

8 Sobel (2008) pg 45

9 Sobel (2008) 46

national and international contexts. In other words, make sure children understand the immediate implications of their actions as well as their broader environmental implications what is learned and the physical environment that children experience

-        Provide hands-on-education: make a connection between what is learned and the physical environment that children experience

-        Stay small: a problem with nature education is that it can get to broad and abstract too fast. Children understand at different levels. Start with small concepts and work into larger concepts. For example, a child needs to understand the importance of one flower (how it grows, it's ecological role, it's importance) before they can understand the significance of flowers in general

-        Encourage children to use media to provide emphasis to experiences: allow children to experience an element of nature and then encourage them to research more about what interests them through nature television shows, internet learning, and books.

-        Teach to developmental level: Children in early childhood (from ages four to seven), children in middle childhood (from ages eight to eleven), and late childhood (from twelve to fifteen) all understand nature differently. Education needs to be catered to these developmental levels.

-        Understand and cater to each child's interest

-        Understand stages of nature learning: Typically nature learning follows the pattern empathy, exploration, and social action. Children need to first care about a subject, then explore the topic themselves, and then can be expected to create action based on this caring and knowledge. Adults cannot expect a child to act to protect something that they do not care for or know very little about.

        Schools can provide natural through school ground design. Some methods of encouraging children to play outdoors are to provide specific elements which correspond to specific types of play and developmental needs of different ages:

-        Creation of "small worlds": creating microcosms of nature within the larger playscape can encourage children to relate learning about small ideas to larger abstract ideas.[8]

-        Create "islands" that provide opportunities to understand simplified concepts. An example would be a place for caterpillars to build cocoons. This allows children to watch and learn a single biological process out of the context of other natural processes, thereby simplifying it into something easily understandable.[9]

Notes and Citations

10 Sobel (2008) pg 42

11 Nahban and Trimble (1994) pg 7

12 Heerwagen and Orains (2002) pg 45

13 Sobel (2008) pg 40

14 Heerwagen and Orains (2002) pg45

- Allow children to assist in the creation of their playscape

- Fort programs: Encourage children to build "forts" which allows children to experiment with natural elements and create their own rules for caring for their "fort" and encourages children to work together in nature to accomplish a goal.[10]

- Create opportunities for small landscape and large landscape experiences: small landscape experiences meaning exploration under rocks, around corners, inside plants, and under trees, and large landscape experiences meaning views to distant places.[11] This can be accomplished through creation of enclosed spaces with views to larger vistas

- Outdoor playrooms for small numbers of children: Younger children prefer to play in small groups, by creating smaller play spaces younger children will be more likely to play cooperatively.[12]

- The creation of outdoor classrooms in which each individual child has their own (or a small group of children have their own) space around the perimeter of a larger group space.[13]

- Create spaces for children to have control over

- Create "naturally occurring shelter": children of kindergarten age typically seek naturally occurring shelters such as insides of large bushes, under trees, and small enclosures.

- Allow for the creation of shelters: older children prefer to create their own spaces. Through having moveable parts (such as large branches, movable plants and furniture, or changeable landscapes) older children can build and change their own shelters according to specific play desires.[14]

Learning from Playground Design Experience

Lessons learned from gaps left in traditional, conventional, adventure and Imagination Playgrounds and the forest school approach can help guide child playscapes designers towards correcting these gaps in future playgrounds. Specifically, designers can follow these guidelines:

- Inclusion of vegetation: Variety of fall colors, leaf shapes and sizes, seeds and nuts, spring flowers, bark textures, heights and widths. Should include trees, bushes, ground covers, and flowers. Could also include vegetables, fruits and other edible vegetation. Use of native plants offers opportunities for education about local ecology.

- Use of natural elements: Inclusion of controlled water elements such as ponds or creeks, sand, rocks,

earth, wildlife (such as insects, birds, and possibly small mammals), and opportunities to experience changing seasons and weather (wind, fall color, winter snows, rain, etc…)

-       Integration of manufactured play equipment: opportunities for climbing, sliding, running, chasing, swinging, see-sawing, hanging, etc…

-       Provision of building materials and opportunities for change: inclusion of elements which children can manipulate to create new and unique experiences. Use of natural building materials similar to those in Adventure Playgrounds or prefabricated play elements like those used in Imagination Playgrounds serve this purpose

-       Variety of sensory stimulation: changes in textures, colors, smells, and sounds can be provided through the use of many different building materials including play equipment and plants. Sounds can be as simple as crickets or the rustle of tree leaves and smells.

-       Providing for a variety of physical activities: Play equipment and the organization of enclosed and open spaces can encourage different levels of physical activity in different areas of the playscape

-       Provision for different types of play: Functional play for gross-motor and basic skill development (running, climbing, and other physically active play), construction play for creative thought and problem solving, and symbolic play for socio-dramatic role-playing and fantasy play.

-       Variety of spaces for different ages: smaller semi-enclosed spaces for younger children to play in small groups or individually while being able to observe other children as well as larger spaces for older children to play in larger groups.

-       Relationship to place: Playscapes should reflect local values, ideas and needs

Design Guideline	Definition
Diversity of Sensory Experiences	Incorporation of elements which stimulate sight, sound, touch, taste, and smell
Diversity of Physical Challenges	Incorporation of physical elements which provide a variety of physical challenge such as climbing, crawling, running, sliding, swinging, etc…
Diversity of Natural Elements	Incorporation of a variety of natural elements such as topographical changes, vegetation, and materials
Moment of Mystery	Adventures which are unpredictable and push children's physical and mental abilities in an exploration of the unknown
Paracosms	Imagined worlds which children create and develop over prolonged and multiple play occasions
Wildlife Interactions	The incorporation of plants which encourage insects, birds, and small creatures to inhabit spaces where children will be able to observe or interact with them
Creation of Connections	Give children multiple destinations with multiple methods of reaching those destinations allowing them to explore and mentally map their playscape according to their own preferences and interests
Elements for Manipulation	Opportunities for places within the playscape to become integral in imaginative play
Things to Collect	The incorporation of unique movable objects which children can seek out and gather into collections
Individual Experiences	Encouraging children to experience nature by bringing them to locations where nature is prevalent and also allowing activities which give children kinesthetic experiences
Adult and Child Groups	Groups that children and adults can be members of which show children how and why adults care for specific natural phenomena and encourages them to act and care for those phenomena
Social Experiences	Create groups which encourage children to think and act environmentally

Table 5.1: Design Guidelines

Design Guideline	Definition
Urban Experiences in Nature	Provide opportunities to equalize experiences between urban and rural children
Community Action	Encourage community action through specific acts to influence the larger community, protect existing outdoor space, encourage growth of new outdoor spaces and seek nature experiences with children
Recess at Schools	Encourage schools to offer more frequent recess times per school day, but shorten each recess time to twenty minutes for maximum attention benefits
Green Existing School Grounds	Redesign school yards to simulate natural playscapes through a variety of sensory stimuli, physical challenges, and natural elements
Activity Level Areas	Provide areas for high-level activities (running, large organized sports), medium-level activities (climbing, crawling, small group sports), and low-level activities (sitting, small social groups)
Child-Led Activities	Create areas for multiple group sizes, clusters of spaces, and specifically designed activity areas
Environmental Education	Teach locally important lessons, provide hands-on experiences and developmentally appropriate learning opportunities, and cater to individual student interests
Redesign School Grounds	Create specific sizes and spaces of opportunities for variation which encourages children of different ages to play outdoors according to their development level
Mix of Pre-Fabricated Structures and	Integrate pre-fabricated and site specific elements to utilize benefits of both
Relationship to Local Place	Design playscapes to reflect locally important events, places, and natural processes

Table 5.1 (Continued): Design Guidelines

Design Guideline	Functional Play	Construction Play	Symbolic Play
Diversity of Sensory Experiences	X	X	X
Diversity of Physical Challenges	X		
Diversity of Natural Elements		X	
Moment of Mystery	X	X	X
Paracosms			X
Wildlife Interactions	X	X	X
Creation of Connections	X		X
Elements for Manipulation		X	
Things to Collect	X	X	X
Individual Experiences			
Adult and Child Groups			X
Social Experiences			X

Table 5.2: Design Guidelines relationship to play types

Design Guideline	Functional Play	Construction Play	Symbolic Play
Urban Experiences in Nature	X	X	X
Community Action			X
Recess at Schools	X		X
Green Existing School Grounds	X	X	X
Activity Level Areas	X		
Child-Led Activities	X		X
Environmental Education		X	X
Redesign School Grounds	X	X	X
Mix of Pre-Fabricated Structures and Site-Specific Elements	X	X	X
Relationship to Local Place	X		X

Table 5.2 (Continued): Design Guidelines relationship to play types

Design Guideline	Encourages Nature Experiences	Provides Social Opportunities	Encourages Environmental Action
Diversity of Sensory Experiences	X		
Diversity of Physical Challenges		X	
Diversity of Natural Elements	X		
Moment of Mystery			
Paracosms		X	
Wildlife Interactions	X		X
Creation of Connections			
Elements for Manipulation	X	X	
Things to Collect	X		
Individual Experiences	X		
Adult and Child Groups	X	X	X
Social Experiences	X	X	X

Table 5.3: Design Guidelines relationship to Nature Experiences

Design Guideline	Encourages Nature Experiences	Provides Social Opportunities	Encourages Environmental Action
Urban Experiences in Nature	X		X
Community Action		X	X
Recess at Schools	X	X	
Green Existing School Grounds	X		
Activity Level Areas			
Child-Led Activities		X	
Environmental Education	X		X
Redesign School Grounds	X		
Mix of Pre-Fabricated Structures and Site-Specific Elements	X		
Relationship to Local Place	X		X

Table 5.3 (Continued): Design Guidelines relationship to Nature Experiences

Design Guideline	Improves Attention Levels	Offers Variety of Activity Levels	Improves Motor Development
Diversity of Sensory Experiences	X	X	
Diversity of Physical Challenges	X	X	X
Diversity of Natural Elements	X	X	X
Moment of Mystery		X	X
Paracosms			
Wildlife Interactions		X	
Creation of Connections			X
Elements for Manipulation	X	X	X
Things to Collect	X		X
Individual Experiences	X	X	
Adult and Child Groups			
Social Experiences			

Table 5.4: Design Guidelines relationship to Health and Development

Design Guideline	Improves Attention Levels	Offers Variety of Activity Levels	Improves Motor Development
Urban Experiences in Nature	X	X	
Community Action			
Recess at Schools	X	X	
Green Existing School Grounds	X	X	X
Activity Level Areas	X	X	X
Child-Led Activities		X	
Environmental Education			
Redesign School Grounds	X	X	X
Mix of Pre-Fabricated Structures and Site-Specific Elements	X	X	X
Relationship to Local Place			

Table 5.4 (Continued): Design Guidelines relationship to Health and Development

Design Guideline	Traditional Playgrounds	Adventure Playgrounds	Imagination Playgrounds	Contemporary Playgrounds	Forest Schools
Diversity of Sensory Experiences		X	X		X
Diversity of Physical Challenges		X		X	
Diversity of Natural Elements		X			X
Moment of Mystery		X	X		X
Paracosms	X	X	X	X	X
Wildlife Interactions					X
Creation of Connections			X	X	
Elements for Manipulation		X	X		X
Things to Collect		X	X		X
Individual Experiences					X
Adult and Child Groups	X	X	X		
Social Experiences	X	X		X	

Table 5.5: Design Guidelines relationship to playground evolution

Design Guideline	Traditional Playgrounds	Adventure Playgrounds	Imagination Playgrounds	Contemporary Playgrounds	Forest Schools
Urban Experiences in Nature		X			
Community Action					
Recess at Schools	X			X	
Green Existing School Grounds		X			X
Activity Level Areas		X		X	
Child-Led Activities		X	X	X	X
Environmental Education		X			X
Redesign School Grounds	X			X	X
Mix of Pre-Fabricated Structures and Site-Specific Elements		X	X	X	
Relationship to Local Place		X		X	X

Table 5.5 (Continued): Design Guidelines relationship to playground evolution

Tables 5.2-5.5 outline the relationships between key points discussed in Chapters 1-4: play types, nature experiences, health and development, and the evolution of playground design. Each guideline corresponds to elements suggested in each chapter, in some cases guidelines are applicable to every chapter while in other instances guidelines correspond directly to one chapter.

Notes and Citations

1 Kahn (2002)

2 Kellert (2002)

3 Nahban and Trimble (1994) pg 30

4 Nahban and Trimble (1994)

5 Nahban and Trimble (1994) pg 11

6 Kahn (2001) pg 5

7 Robert Wood Foundation (2007) pg 3

Chapter 6: Research Constraints and Challenges

Introduction

There are many challenges when doing research in an emerging field. The literature reveals that many disciplines are concerned with childhood outdoor play and experiences in nature. Unfortunately, there is very little interdisciplinary work that makes connections across fields. An interdisciplinary approach connecting research interests in the clinical, psychological, physical, emotional, and cognitive benefits of increased childhood experiences outdoors is needed. Issues of social equity, gender differences, and fear are coherently mentioned in literature, but none are actively addressed in the research. Some disciplines are beginning to develop new ideas such as Kahn's theory of Generational Amnesia[1] and Pyle's theory of Extinction of Experience.[2] These theories are not addressed in the main-stream literature on childhood outdoor play and experiences in nature, but are emerging potential methods of understanding and addressing children's relationship with outdoor play and natural experiences.

Social Equity

Contrary to the famous words scribed in the U.S. Constitution by Thomas Jefferson, all men are not created equal, especially when it comes to access to public amenities such as outdoor playscapes. Class, race, and income matter.[3] Children with low-income inner-city backgrounds have less access to wild places and have less experiences outdoors for recreation and play and are therefore at a disadvantage.[4] Income and geographic location play a large role in the social inequalities faced by children. Children in poor city districts have less access to "unpeopled" places and "an increasingly large proportion of inner-city children will never gain adequate access to unpeopled places, neither food-producing fields nor wildlands."[5]

In addition, politically disenfranchised and lower-income people often shoulder more environmental harm in the outdoors that they have access to.[6] In 2007, researchers observed K-12 students in California as part of an evaluation of Physical Education courses. This study found that "Low income and minority students received poorer quality PE due to lack of teacher training, large class sizes and inadequate facilities."[7] There is a strong correlation between outdoor facilities within a community- such as playgrounds, parks, and recreation programs- and physical activity. Low-income and minority neighborhoods often have fewer opportunities for outdoor

Notes and Citations

8 Robert Wood Foundation (2007)
pg 5

9 Wesley, Jennifer K. and Gaarder, Emily. "The Gendered 'Nature' of the Urban Outdoors: Women Negotiating Fear and Violence." *Gender and Society* (2004) vol 18 no 5 pg 645

10 Wesley and Gaarder (2004) pg 645

11 Wesley and Gaarder (2004) pg 648

12 Bixler and Floyd (1997) pg 447

13 Bixler and Floyd (1997) pg 444

14 Bixler and Floyd (1997)

pg 444

recreation.[8] If the issues of play, creation of environmental identity, health, attention, and physical activity levels are to be resolved, the inequalities in children's access to outdoor playscapes will need to be leveled.

Gender Differences

Wesley and Gaarder discuss the socially constructed fears for women who participate in public space recreation activities. They state that "gender-related feelings of objectification, vulnerability, and fear in this space limit women's participation."[9] Specifically, women's fear of sexual assault and harassment cause women to occasionally avoid recreational activities in public spaces such as parks.[10]

The "uniquely therapeutic value of outdoor or wilderness recreation for women in terms of empowerment" is negated as women often "face constraints in natural outdoor space related to the geography of fear in the outdoors."[11] There is a gender related disadvantage for women in access and opportunity in outdoor recreation spaces and programs. Because women are often the primary care providers for their children, does this fear translate to children? Does this fear cause women to avoid outdoor recreation with their children, and if so, what effect does that have on children's outdoor recreational opportunities? These questions pose areas for future research. The research results might be used to affect the ability for children to utilize outdoor playscapes, especially those frequented by families and those outside the public education system.

Fear

Fear can be derived from a number of issues: gender related fears, parental fears, disgust, or discomfort. Bixler and Floyd suggest that a "disgust reaction may be expressed for the 'dirtiness' of wildlands" and that this disgust "is emotional discomfort resulting from close tactile, olfactory, or visual contact with certain unpleasant stimuli."[12] Bixler and Floyd suggest that "numerous anecdotal reports of fears expressed by students taken to wildlands as part of school or recreation center programs suggest that some people actively dislike such environments."[13] In addition, "despite the many benefits identified as products of experiences in natural environments… some people living near parks do not use them… and 86% of the U.S. population is not involved in wildland recreation."[14] This is partly due to parent involvement in childhood outdoor recreation shifting to a greater indoor focus. This begs the questions: why do people dislike wildlands? and what alternative areas of outdoor recreation are available to these people?

Parental concerns for traffic and crime in neighborhoods influence on children's use of outdoor

Notes and Citations

15　Robert Wood Foundation (2007) pg 5

16　Bartlett (1999) pg 71

17　Bartlett (1999) pg 71

18　Kahn (2001)　pg 116

19　Kahn (2001) pg 121

20　Staempfli (2009) pg 274

21　Staempfli (2009) pg 275

22　Staempfli (2009) pg 276

23　Kahn (2002) pg 107

24　Kahn (2002)

25　Kahn (2002) pg 110

26　Kahn (2002) pg 111

27　Kellert (2002); Sobel (2008); Heerwagen and Orains (2002)

facilities, especially in low-income areas.[15]　Bartlett's study of a Philadelphia neighborhood suggest that "vandalism, drug use, and criminal behavior" are partially to blame for parental fear and lack of opportunity for children's outdoor play.[16]　Bartlett notes that "when police helped neighborhood volunteers clean up vacant lots and plant gardens, burglaries and thefts dropped by 90 per cent," making parental fears decrease.[17]　Similar findings are seen in other inner-city areas.　A study conducted in Houston, revealed two hindrances that stopped parents from taking their children outside: pollution and social violence[18]　Parents who said that "they did not often go to parks, the reasons sometimes stemmed from not having a car to get to the nicer and safer parks outside their community."[19]

　　　Play professionals in some disciplines suggest that parental "obsession with the control of the natural environment and the elimination of possible and imagined risks to child development has resulted in children growing up in an artificial world."[20]　The children's Play Council in England states that "exposure to risk of injury, and experiences of actual minor injuries, is a universal part of childhood" and "such experiences also have a positive role in child development" by giving children a direct experience with consequence and choices as well as the extent to their own physical abilities.[21]　Staempfli suggests that risk taking should be a designed part of play.　He states that "play provision should aim at balancing between the need to offer positive risks and the need to keep children relatively safe from harm and injury."[22]

Generational Amnesia

　　　There is an interesting correlation between social inequality and what Kahn calls Generational Amnesia. Kahn states that "first people need to feed their bellies and only then can they become concerned with higher-order values, such as environmental degradation."[23]　The main difference between Kahn and Huber is that Kahn believes that environmental complacency isn't simply caused by poverty, but rather a combination of factors. One of these factors is generational amnesia.[24]　Kahn states that this amnesia has its roots in childhood experience.[25]　He states that "by definition this problem arises because of an increasingly impoverished natural environment that limits the richness and diversity of a child's interaction with the natural world."[26]

　　　There is a "moment" between six and twelve years of age when a child has a life-altering experience in nature.[27]　If this experience happens in an environmentally degraded landscape then the child's perception of an "ideal" natural landscape is tainted.　According to the theory of generational amnesia we understand and perceive the natural environment that we encounter during

Notes and Citations

28 Kahn (2002)

29 Kahn (2002) pg 106

30 Nahban and Trimble (1994) pg 86

31 Nahban and Trimble (1994) pg 86

32 Kellert (2002) pg 141

33 Kellert (2002) pg 141

34 Kellert (2002) pg 143

childhood to be the norm against which we measure our future experiences in nature.[28] Each generation perceives that nature as the norm or nondegraded condition of nature or as Kahn states the "normal experience."[29] This theory needs long term testing to determine if this is a phenomena which impacts environmental consciousness development from childhood to adulthood.

Extinction of Experience

According to Nahban and Trimble, we need experiences with nature to become mentally and emotionally whole, at peace. Lack of interaction creates an extinction of experience.[30] Robert Michael Pyle has defined 'the extinction of experience,' as the "termination of direct, frequent contract between children and wildlife."[31] Pyle states that "one of the greatest causes of the ecological crisis is the state of personal alienation from nature in which many people live"[32] and that children now "lack a widespread sense of intimacy with the living world."[33] Kellert further states that this extinction of experience is caused in part by changes in "family traditions, recreational activity, social support networks, and community relations" which have decreased the opportunities that children have to experience nature.[34] Nahban and Trimble and Kellert raise an interesting question: what relationships does family traditions, social support, and community relationships play in creating experiences between children and nature? These should be addressed in future research.

Conclusion

The primary challenge to research on childhood play and nature experiences is the scarcity of active scientific research being done specifically correlating children's outdoor play, childhood experience in nature, and environmental consciousness. This lack of scientifically based research stems farther into a lack of active research being done at schools who employ progressive or green playscapes. More quantitative data is needed to substantiate much of the current research being done in this field.

Additional research in social equity, gender differences, fear of the outdoors, generational amnesia, and extinction of experience can begin making connections between research interests in different fields dealing with outdoor play. This interdisciplinary work could provide additional insight and more in-depth theories about the importance of childhood experiences in nature.

Notes and Citations

1 Youell (2008); Fjortoft and Sageie (2000); Bartlett (1999)

Thesis Conclusion

Our environment is crumbling; peak oil, ozone depletion, over population, pandemics, and ocean warming are but a few of our global crises. As our resources become scarcer, our pockets become emptier and our prospects become dimmer. In the coming decade the world will find itself faced with a major dilemma: how can we not only survive, but how can we thrive on a shrinking planet? The future here looks bleak, but there is light at the end of our environmental tunnel. Our children offer hope; a means to start over; a reason to find a solution. I've heard it said that "children are our future." If this is indeed true, which I think we all agree it is, then we need to recognize the importance of preserving and protecting our children. Preserving their innocence; protecting their experience. Children are our most precious, our most vital, and our most delicate resource.

It has been the debate within the scholarship of many disciplines the effect that our growing dependence on technology has had on our children and as a direct consequence our shrinking relationship with the natural world. Children feel the consequences of this loss most deeply. My parents are always telling my sisters and I stories about "when I was young…" or "back when…" that seem to always directly link childhood play with nature. Even I have those stories to share with my daughter: the time my sisters and I made mud pies in a clogged drainage ditch near my childhood home; the time my best friend and I dug tunnels under the snow and pretended we were on expeditions in the arctic; the time it rained for days and we went swimming in the culvert behind my dad's house; and the time we found a rattlesnake in a river in West Virginia. My parents always emphasized the importance of spending time outside: camping, hiking, nature walks, picking bark off trees, admiring the beauty of the changing leaves, feeling the freezing cold on our fingers in the winter- it all sounds now like the subject of fairy tales; a happy childhood which could be directly linked with our play experiences in nature.

Play is a pivotal part of a child's life. It fosters creativity, imagination, social connections, and learned behaviors. Play is a critical element of growing-up. The specific environment used for play can have different cognitive, social and motor development impacts on children.[1] There are three types of outdoor playscapes which experts point to as landscapes which can fulfil the need for childhood outdoor play: natural, wild, and constructed places.

Natural playscapes most often include elements of vegetation and the notions of spontaneity and diversity.

75

Notes and Citations

2 Fjortoft and Sageie (2000)

3 Louv (2005)

4 Louv (2005); Fjortoft and Sageie (2000); Nabhan and Trimble (1994)

5 Sobel (2008) pg 16

6 Clayton and Opotow (2003) pg 45

7 Kals and Ittner (2003)

In addition, natural playscapes are often process driven.[2] One of the most beneficial elements of natural playscapes are that they require the use of all senses: sight, sound, smell, touch, and taste. It is the diversity of sensory experiences that initiates a more creative learning environment for children.[3] In addition, diversity of physical elements such as vegetation and topography that act as catalysts for children's play.[4]

Constructed playscapes can offer children the security they and their parents many need to enjoy outdoor playscapes. These playscapes must be carefully constructed to offer similar opportunities to natural playscapes. Through diversity of sensory stimulation and diversity of physical elements it is possible for constructed playscapes to simulate natural playscapes.

Childhood connection with nature is decreasing from generation to generation as emphasis on book-learning, media entertainment, and increased programed time are becoming more prevalent. this is creating a disconnection between children and nature. Experiences in nature help to shape children's conceptions and values and encourage children to become environmentally concious. Children rely on both their independent experiences with nature and the influence of adults and peers.

There are three types of contact experiences in nature: direct, indirect, and vicarious or symbolic. While each of these types of contact are important for children to develop an environmental consciousness, direct experience are most important for childhood exploration of natural elements. Experts point to the need for natural experiences to happen in the "developmental window of opportunity" which takes place between early and middle childhood.[5] Early childhood anthropomorphic connections to the natural world and middle childhood biocentric connections to the natural world work hand-in-hand in the creation of a child's environmental identity and environmental consciousness.

Environmental identity is a way of organizing "information about the self" in relationship to the natural environment based on context and experience.[6] Environmental identities have the ability to shape the way that children respond to protection of the environment.[7] Environmental identity is developed by both social and personal relationships with nature. A combination of factual and academic learning about nature and direct experiences in nature- whether through social environments or individual exploration- is required to develop a strong connection with nature and an environmental identity.

Structural development theory differs from both endogenous and exogenous. It proposes that "development is grounded in human knowledge and values, in the active mental life of children as they construct

Notes and Citations

8 Kahn (2001) pg 47

9 Kahn and Kellert (2002) pg xi; Coley, Solomon, and Shafto (2002)

10 Sageie and Fjortoft (2000)

increasingly more adequate ways of understanding their world and of acting upon it."[8] Through these experiences also comes the creation of values. Folk theory addresses how children interpret and understand the world of plants and animals.[9] Children relate new information based on their old experiences. Childhood experiences with the distinction between living and non-living drives their understandings of nature. It is these understandings that play an important role in whether a child will develop an environmental identity that regards nature as valuable and worthy of protection.

Many researchers and child play advocates found that the changing relationship between children and our outdoor world is having lasting effects on play and the creation of environmental identity, other researchers are finding that outdoor play offers countless health benefits. Researchers have recently begun to see a correlation between time spent outdoors and childhood occurrences of Attention Deficit Disorder (ADD), Attention Deficit and Hyperactivity Disorder (ADHD), and Depression. In addition, attention is dependent on the length of time spent at recess. This means that children need recess time to refocus and become more attentive during instructional times.

Not only does length of time spent at recess matter, but the outdoor environment does as well. There is also a connection between the amount of "green" in a school yard and the level of attention improvement. Children with increased activity levels are less likely to be overweight. Increased time outdoors increases activity levels. This means that increased outdoor activity could decrease the occurrence of childhood obesity and the health problems associated with obesity. In addition, access to natural play elements can improve motor function and development.[10]

School yards evolved as theories on playground design changed to address research on childhood learning and play. From 19th century playgrounds that aimed to socialize lower-class children through exposure to higher-class children and adult behavior, to twenty-first century experiments in Imagination Playgrounds, child playscapes have been on the cutting edge of research in child development and play. Through understanding how playgrounds have evolved as research on play and child development has changed it may be possible to find moments of weakness and benefits in each type of playscape. By correcting these weaknesses and utilizing benefits in future playground design it is possible to incorporate natural elements and encourage childhood experiences in nature as well as increase physical activity levels and motor development.

Additional research in social equity, gender

differences, fear of the outdoors, generational amnesia, and extinction of experience can begin making connections between research interests in different fields dealing with outdoor play. This interdisciplinary work could provide additional insight and more in-depth theories about the importance of childhood experiences in nature. Design interventions to encourage specific types of play, facilitate childhood experiences in nature, improve health, attention, and motor function, and involve school yards in environmental education can help to create child playscapes which more adequately encourage play experimentation and the creation of an environmentally active child.

I worry for my daughter. While I try to give her the experiences that I had as a child, it seems to become increasingly difficult. There is never enough money; there is never enough time; it is never safe enough; it is always a struggle. It is to the point where I feel it is an insurmountable obstacle: the balance between Hannah Montana and Aldo Leopold is an increasingly difficult balance to maintain. I even find myself struggling to reconnect: it took fifteen minutes to write the previous sentence; there just is no good comparison between tween popular culture and nature. I just couldn't seem to find a name in my head that could compare the preteen obsession with "living like a rock-star" to a rustic individualist connection with nature. My daughter knows all the current Disney stars: Hannah Montana, Zach and Cody, London Tipton, and the Jonas Brothers, in fact she seems to have an obsession with anything that comes off that magic box that sits in our living room. But does she know how plants grow? Does she know where our food comes from? Does she know the process our water goes through before it comes into our house, and where it goes after? And does she know what makes the sky blue, the grass green, the oceans blue, and the leaves turn orange?

Fortunately, I have taught her about the way that our planet functions. She asked me the other day: "mommy, there aren't any leaves on the trees, how come we can still breathe?" One of the greatest joys of parenting is seeing the wonder and curiosity in your child's eyes when they realize the greater importance of the processes around them and their personal connections with those processes. There is a danger here, one which has the ability to shape the future of our world. As children become more familiar with technology (video games, television, cell phones and things that inevitably "plug you in") they become less personally connected to the larger environmental picture. They lose the relationship that children's experiences have been dependent upon for generations. Some would argue that this is just a shift; a shift towards a technically driven society; a shift towards global infrastructures, economies, and internationalism.

I argue that yes this is a shift towards those things, but it is also a shift away from a pivotal relationship between humans and nature.

Children learn through experience; they learn by seeing, smelling, tasting, and touching. As humans, we grow to appreciate what is familiar and we grow to love what we develop personal connections to. Nature is one of these things which need to be appreciated as familiar, and grown to love through repeated interaction. As designers of children's playscapes it is important for us to recognize the importance of play, nature experiences, and the benefits that outdoor play has on children's health and development. Schools offer a location where research on the benefits of outdoor play and nature experiences can be directly translated and applied to environmental education and playscapes.

Annotated Bibliography

"Adventure Playground." Parks, Recreation, & Waterfront: the City of Berkeley, California. <http://www.ci.berkeley.ca.us/contentdisplay.aspx?id=8656>

       Adventure Playground in the City of Berkeley, California was built in 1979 and has maintained 31 years of use through public donations, parental involvement, and support by the Parks, Recreation, & Waterfront department through the Marina Experience Program. This playground has been hailed as one of the top ten playgrounds in the   world by National Geographic, and one of the top five playgrounds in the United States by *Newsweek* and the *Boston Globe*.

Alhassan, Sofiya et al."The effects of increasing outdoor play time on physical activity in Latino preschool children." *International Journal of Pediatric Obesity.* (2007) no 2

       Sofiya Alhassan et al studies the effects of increased time spent outside on physical activity levels. Specifically, they tested the "hypothesis that increasing preschool children's outdoor free play time increases their daily physical activity levels" and found that "substantially increasing preschoolers' outdoor free play time did not increase their physical activity levels" (pg 153) but that there are ideal lengths of time for preschool outdoor free play dependent on activity type (pg 156). Alhassan et al noted a difference in activity level between activities such as seesawing, swinging, and jungle-gym play (pg 156). They concluded that because activities varied there was a limited correlation between time spent outdoors and activity level (pg 157).

Bar-Haim, Yair and Bart, Orit. "Motor Function and Social Participation in Kindergarten Children." *Social Development*. (2006)

       Yair Bar-Haim and Orit Bart's study on the relationship between motor abilities and social behavior "indicates significant associations between children's motor abilities and social and nonsocial forms of play" and that "individual variations in children's motor abilities are associated with individual differences in social and solitary play behavior" (pg 296). In general, the study concludes that children with low motor ability often experience low social play and typically play solitarily (pg 299). This can be attributed to the need for motor abilities in many of the group play activities that children initiate. Specifically, children without motor abilities similar to their peers may have a hard time dealing with the demands of a social environment (pg 304). Because indoor play in school environments tends to be more independent, children with low motor abilities tend to thrive more in indoor settings; in contrast, due to the high physical activity demands of outdoor play, children with low motor abilities find outdoor social play more difficult (pg 306).

Bartlett, Sheridan. "Children's experience of the physical environment in poor urban settlements and the implications for policy, planning and practice." *Environment and Urbanization.* (1999) vol 11 no 2

       Bartlett's paper examines the needs of children in urban development policy. Specifically, this research looks at how neighborhoods in low-income districts fail to meet health and outdoor play needs for most children. Bartlett states that neighborhood crime and parental perceptions of violence also play an important role in children's outdoor play.

Barovick, Harriet. "Building a Better Playground." *TIME* (August 2010)

       Barovick discusses growing interest in the use of moveable parts on playgrounds (called Construction playgrounds). Specifically looks at the Imagination Playground in New York City. The Architect worked with the nonprofit playground design company Kaboom to develop large

moveable blue blocks which were "deliberately big so kids will be more likely to assist each other with them" (pg 46). Similar to European adventure playgrounds "where supervised kids can get creative with a wide variety of objects, follows the prevailing theory that free, child-initiated play is a critical component of healthy social, emotional and intellectual development" the Imagination Playground provides movable play materials and permanent play equipment (such as overhead structures and climbing towers) under the supervision of "play associates" whom have been trained in child and equipment safety (pg 46). Supervision is important on this type of playground to ensure that movable pieces don't leave the site, to make-sure play equipment isn't mistreated, and that children are playing safely. Because supervision is required, additional funds are needed. New York City has used a mixture of public and private funds to fund play associates while other cities with Imagination Playgrounds have relied on volunteers.

Bixler, Robert D and Floyd, Myron F. "Nature is Scary, Disgusting, and Uncomfortable." *Environment and Behavior.* (1997) vol 29 no 4

Bixler and Floyd's study examines rural and urban eighth-grade student's perceptions of outdoor places. They discovered three themes in these children who preferred manicured park settings: fear, disgust, and need for comfort. These children also were more likely to enjoy indoor recreation and be less likely to have ambitions for future careers outdoors. Children who preferred manicured landscapes and indoor recreation were more likely to be urban. Bixler and Floyd note that the negative perceptions of outdoor places have a negative impact on their desire to play outdoors.

Brown, William H. et al "Social and Environmental Factors Associated with Preschoolers' Nonsedentary Physical Activity." *Child Development.* (2009) vol 80 no 1

William H. Brown et al's study on the "Social and Environmental factors Associated With Preschoolers' Nonsedentary Physical Activity" examined two factors of children's behavior: firstly, they sought to describe the physical activity behaviors and social and environmental events of preschool children; secondly, they sought to find predictors of activity levels (pg 45). This study derives directly from the connection between childhood activity levels and obesity; specifically that "children's early overweight problems predict adult obesity" and the prevention of obesity is a "national health priority" (pg 45). In addition, this study works upon the basis that a large number of children attending center-based programs has increased and that these programs offer opportunity to address such health concerns (pg 46). According to Brown et al. children observed in the study spent 87% of their day indoors- 94% of that time was sedentary- and only 10% of their time outdoors which consisted of mostly "active" physical activities such as walking, running, crawling, climbing, and jumping or skipping (pg 49). One of the most important findings of Brown et al's study was the discovery that child-led outdoor activities tended to be the most active- as opposed to teacher-led playground activities such as organized games (pg 52). According to the study, outdoor play was spent on the following: 26.9% with balls or similar objects, 23.1% in open spaces, 13.9% on fixed play equipment, 13.5% on wheeled toys, and 10.8% on socio-dramatic toys (pg 51).

Clayton, Susan and Opotow, Susan. "Introduction: Identity and the Natural Environment." *Identity and the Natural Environment: The Psychological Significance of Nature.* MIT Press: Cambridge, MA (2003)

Clayton and Opotow suggest that experiences have an impact on the creation of environmental identity. Environmental identity is developed by both social and personal relationships with nature. It is the dynamic between social and personal which creates an identity, sometimes each varies in influence. Social interactions in nature are often more powerful than individual interactions (pg 17).

Coley, John D., Solomon, Gregg E.A. and Shafto, Patrick. "Chapter 3: The Development of Folkbiology: A Cognitive Science Perspective on Children's Understanding of the Biological World." *Children and Nature: Psychological, Sociocultural, and Evolutionary Investigations.* MIT Press: Cambridge, MA. (2002)

People understand things based on what they already know. Children and adult create relationships and understandings differently. Children understand things according to a folkbiology which points to experiences as the primary way that children create reasoning (pg 66). Childhood experience with the distinction between "living" and "nonliving" is what drives their understandings of nature. Children's folk biology has implications on science education (pg 86).

ed. Davis, Allen F. and Mark H. Haller. *The Peoples of Philadelphia: A History of Ethnic Groups and Lower-Class Life, 1790-1940.* University of Pennsylvania Press: Philadelphia. (1973)

Davis and Haller suggest that an analysis of lower-class life needs examining in Philadelphia (pg 3). They note that racial and class tensions during early development in the city have led to many segregation related problems today (pg 289). Because poor blacks were the lowest groups socially and economically historically they have faced housing, employment, and educational disadvantages (pg282). There were three main themes which marked the period of growth between 1790 and 1940 in Philadelphia. The first was the tensions between crime and racial conflicts with the larger societal search for social order (pg ix-x). Second, racial and ethnic conflicts were a constant struggle for new residents within the city. And third, neighborhoods created a since of community which were both diverse and often segregated (pg x). Poor blacks and Italians were the lowest groups both socially and economically within the city social hierarchy. They were concentrated in the slum areas of Southwark and have historically had the least educational opportunities.

Dyment, J.E. and Bell, A.C. "Grounds for movement: green school grounds as sites for promoting physical activity." *Health Education Research.* (2008) vol 23 no 6

J.E. Dyment and A.C. Bell explore how 'green' school grounds affect the quality and quantity of physical activity for elementary school children in Canada. Their study shows that through greening, schools grounds can diversify the kinds of play that children experience, which acts as an "important intervention" in children's physical activities at school (pg 952). Dyment and Bell's study suggests that school grounds should be greened in addition to efforts such as "increasing the amount of physical education offered, providing healthier food choices in the cafeteria, and encouraging walking and cycling to and from school" as part of a comprehensive plan to prevent obesity (pg 952). Conventional playgrounds at schools are primarily "open expanses of turn and asphalt" (pg 952) and have "limitations in promoting physical activity because many children are not interested or able to play" in the vigorous and physically demanding ways that these environments facilitate (pg 953). Dyment and Bell's research suggests that increasing the ability for children to have moderate physical activity play will improve "the quality of children's play and learning experiences" (pg 953).

"Eddison Students- 1918." *Weekly Moment in Time Column.* Grandview This Week Newspaper. (2006) <http://www.ghmchs.org/thisweek/photo-listing6.htm>

This article describes an image of female students during recess at Grandview Elementary School in 1918. The school was built in 1911 across from Harding School for $50,000 and was later turned into Grandview Middle School. The playground on this site is typical of school playgrounds in the early twentieth century.

Fjortoft, Ingunn and Sageie, Jostein. "The natural environment as a playground for children: Landscape description and analysis of a natural playscape." *Landscape and Urban Planning* (2000) vol 48

  Fjortoft and Sageie, focus on the use of a small forest as a natural playscape for children from a kindergarten in Bo, Telemark County in Norway (pg 83). According to this study, there is a correlation between "landscape structure and play functions" (pg 83) meaning that the physical environment has a direct relationship to the types of play that children participate in. In addition, this study revealed that children's motor fitness was improved and there is a positive result on motor abilities from use of natural playscapes and the resulting learning from exploration of space in contrast to traditional child playscapes (pg 83).

Gamble, James C. "Evolution of the Park: Why the Playground is the Heart." Land Design Collaborative, Inc. (2006) *Elevation: Park and Recreation Design Issue.* Newsletter of the Illinois chapter of the American Society of Land¬scape Architects <http://www.landdesigncollaborative. com/new/newsArticle2.htm>

  Gamble describes the history playgrounds in parks from the mid-nineteenth century until the twenty-first century. He describes the changes that occurred in each phase of playground design as it relates to materials, play equipment, safety, and innovation. In the late 1800s to early 1900s playgrounds were primarily handcrafted wooden structures. During the mid-1900s Junk Playgrounds in Europe influenced American playground builders to offer playscapes with opportunities for children created spaces. The late 1900's brought about a mixture in custom design and prefabricated play structures resulting from the Americans with Disabilities Act which encouraged playground designers to provide spaces for children with disabilities. The newest playground design innovations relate children's play-need to construct their own spaces with federal safety requirements.

Garvey, Catherine. *Play: The Developing Child Series.* Harvard University Press: Cambridge, MA. (1990)

  Garvey describes the changes that have occurred socially and economically which have increased the number of children in child-care programs. She states that this increase makes understanding child playscapes more important. The relationship between childhood play and development has made outdoor play additionally important. She outlines methods of design for playgrounds to encourage children to interact with their outdoor environment.

Gebhard, Ulrich et al. "Chapter 5: Moralizing Trees: Anthropomorphism and Identity in Children's Relationships to Nature." *Identity and the Natural Environment: The Psychological Significance of Nature.* MIT Press: Cambridge, MA. (2003)

  Children create connections with the natural world by anthropomorphizing elements within that world that makes it easier to relate to and assign value to. Trees are one of the elements which children most readily relate to. Anthropomorphism of natural elements should be nurtured to encourage children to develop empathy towards nature.

Ginsburg, Golda S. and Kingery, J.N. "Evidence-based practice for childhood anxiety disorders." *Journal of Contemporary Psychotherapy.* (2007)

  Ginsburg and Kingery describe common anxiety disorders experienced by children including the causes, complications, and possible mediation methods through cognitive-behavioral therapy. Ginsburg and Kindery suggest that childhood anxiety can be mitigated by providing outdoor play opportunities and extracurricular activities which also improves performance.

Heerwagen, Judith H. and Orains, Gordon H. "Chapter 2: The Ecological World of Children." *Children and Nature: Psychological, Sociocultural, and Evolutionary Investigations*. MIT Press: Cambridge, MA. (2002)

      Attitudes and preferences are influenced by experience and an evolutionary biological history. Early societies had five main characteristics: small social groups which were often re-lated, few material possessions, children were close in age, infants were constantly carried, and children learned from adult behavior.

"Historic Facilities." City of Oakland: Parks and Recreation. (2010) <http://www.oaklandnet.com/parks/inside_oakland/historic¬facilities.asp>

      The City of Oakland Parks and Recreation department describes each of their historic facilities as well as giving a brief description of their funding needs, history, and costs. These facilities are typical of urban parks and recreation facilities including early 1900's playgrounds.

Holmes, Robyn M. et al. "The effects of different recess timing regimens on preschoolers' class-room attention." *Early Child Development and Care.* (2006) vol 176 no 7

      Due to the increased demands of academic work- stemming from the increased pressure for schools to perform to state established standards of learning to qualify for federal funding- there is s movement within the United States to reduce the amount of recess in public schools (pg 736). Research shows that children are more attentive after regular recess breaks then they are without such breaks (pg 736). Holmes et al introduces the idea of Developmentally Appropriate Practice which states that "young children need a schedule in which there is a balance between child-initiated (such as free-play during recess) and teacher-led activities (such as academic instruction) (pg 738). Interestingly, Holmes et al. noted that recess "periods that are either too short or too long may actually have negative effects" specifically after lunch periods where "long break periods… often witness high rates of anti-social behavior and student boredom" (pg 783). In terms of gender, the study showed that boys reach their peak attention after a 20 minute recess time while girls reach this peak of performance after 10 minutes and maintain similar attention spans through 20 minutes. According to Holmes et al. "boys were less attentive than girls in all conditions" and furthermore that "results point to the importance of breaks for boy, relative to girls" (pg 742). Holmes et al.'s findings can be generalized into the following: "first preschool-ers, like primary school children, benefit from recess"; secondly, "too little or too much outdoor playtime does not produce optimal and efficient learning environments"; and finally, recess ap-pears to optimize attention but does "not necessarily their social behaviors" (pg 742).

Holmes, Robyn M and Procaccino, Jill K. "Preschool children's outdoor play area preferences." *Early Childhood Development and Care.* (2009) vol 179 no 8

      Holmes and Procaccino's study included a sample of forty European-American three and four year old children. These children were observed and data was collected based on gender and play space. The primary findings showed that the child's sex had a significant impact on play space choice. Boys preferred jungle-gyms and swings while girls preferred the sandbox. Holmes and Procaccino suggest that future research should examine children's preferences for mico-spaces.

Kahn, Peter H. Jr. *The Human Relationship with Nature: Development and Culture.* MIT Press: Cambridge, MA. (2001)

      Kahn suggests that even the most minimal experience with nature has the ability to im-pact health and productivity. Biophilia suggests that there is an evolutionary affiliation between people and nature, but there is evidence which suggests that there is also an evolutionary

biophobia for some peoples. Developmental theory offers a methodology to understand the development of the human/nature relationship. Children develop understandings based on existing knowledge of other things in order to understand the world and make decisions on how to act accordingly. Children in lower income neighborhoods (specifically black children) are more likely to have inadequate experiences. A constructivist approach to Environmental Education is needed.

Kahn, Peter H. Jr. "Chapter 6: The Development of Environmental Moral Identity." I*dentity and the Natural Environment: Psychological Significance of Nature*. MIT Press: Cambridge, MA (2003)

According to Kahn, there are two ways that children establish biocentric morals: isomorphic reasoning and tranmorphic reasoning. Isomorphic reasoning is when children compare natural elements directly with humans. Transmorphic reasoning is when children understand that a natural element is not the same as a human, but they use their knowledge of humans to create understandings about the functionality of the natural world. In this way, children ascribe moral equivalences to animals based on functionality.

Kahn, Peter H. Jr. and Kellert, Stephen R. "Introduction." *Children and Nature: Psychological, Sociocultural, and Evolutionary Investigations*. MIT Press: Cambridge, MA. (2002)

According to Kahn and Kellert direct and indirect experiences with nature are critical to physical, emotional, moral, and intellectual development in children (pg vii). They introduce three perspectives about the importance of natural experiences during childhood: evolutionary importance, psychological importance, and sociocultural importance (pg viii)

Kals, Elisabeth and Ittner, Heidi. "Chapter 7: Children's Environmental Identity: Indicators and Behavioral Impacts." *Identity and the Natural Environment: The Psychological Significance of Nature*. MIT Press: Cambridge, MA (2003)

Kals and Ittner suggest that creating experiences for children through social settings, such as school grounds, is important in the development of an environmental identity. They state that even the smallest experiences can impact environmental identity. Environmental identity is defined as part of "identifying with the natural environment and its protection" (pg 136). This is a life-long process that is started in early childhood and helps to determine moral reasoning (pg 137).

Kellert, Stephen R. "Chapter 5: Experiencing Nature: Affective, Cognitive, and Evaluative Development in Children." *Children and Nature: Psychological, Sociocultural, and Evolutionary Investigations*. MIT Press: Cambridge, MA (2002)

Kellert suggests that there is a "moment" between 6-12 when a child has a life-altering experience in nature- during middle childhood it is important to provide opportunities for these experiences to shape the developmentally appropriate values and cognitive learning about nature. He points to three types of experiences in nature: direct, indirect, and vicarious or symbolic experiences (pg 119).

Louv, Richard. *Last Child in the Woods: Saving Our Children from Nature-Deficit Disorder*. Algonquin Books (2005)

Louv explores the growing opinion of environmentalist and some parents that the declining direct interaction between children and wild nature is having negative effects on our children's wellbeing. Louv coins the term "Nature-Deficit Disorder" to describe these negative

effects, and attributes Nature-Deficit Disorder for many childhood learning disabilities and health problems.

Muir, John. *Personal Journal* (1872)

John Muir explains in his journal the importance of actual experiences in nature opposed to reading about nature in books.

Myers, Olin Eugene and Saunders, Carol D. "Chapter 6: Animals as Links towards Developing Caring Relationships with the Natural World." *Children and Nature: Psychological, Sociocultural, and Evolutionary Investigations.* MIT Press: Cambridge, MA. (2002)

Myers and Saunders state that there is a since of morality in caring for another life that could translate into a broader morality of life in general. They suggest that "'natural care' about animals may lead to broader environmental caring" (pg 154).

Nabhan, Gary Paul and Trimble, Stephen. *The Geography of Childhood: Why Children Need Wild Places.* Beacon Press: Boston, MA. (1994)

Nabhan and Trimble state that we need experiences with nature to become mentally and emotionally whole and at peace. Children with low-income inner-city backgrounds have less access to wild places and are therefore at a disadvantage (and have less nature experience), lack of interaction creates and "extinction of experience". Learning by doing and experiencing is stressed; you can't replace hands-on experience. Exposure to wild places is influenced by gender, ethnicity, location, and development.

O'Brien, Liz. "Learning Outdoors: the Forest School Approach." *Education* (2009) vol 37 no 1

O'Brien outlines the functions that Forest Schools can have for childhood development. This method of schooling involves allowing children to have consistent experiences in woodland areas. The study reveals that children who had consistent exposure to woodlands have higher confidence, concentration, communication and physical skills.

Orr, David W. "Chapter 11: Political Economy and the Ecology of Childhood." *Children and Nature: Psychological, Sociocultural, and Evolutionary Investigations.* MIT Press: Cambridge, MA. (2002)

Orr suggests that there are three pillars of "Political Economy" which affects children: economic growth (pg 287), materialism (pg 288), and commodification (pg 289). These three political economies affect children because the old and familiar are constantly replaced with new, more profitable ways of achievement. Economic growth, materialism, and commodification indirectly encourage fewer natural experiences.

"Playgrounds in Parks." New York City Department of Parks and Recreation. (2010) <http://www.nycgovoarks.org/sub_about/parks_history/playgrounds.html>

"Playgrounds in Parks" is an online publication by the New York City Department of Parks and Recreation which outlines the history of New York City's urban parks as well as the changing ways that parks have been designed and constructed. Also outlined is the current trend in Imagination Playground construction and funding.

Robert Wood Johnson Foundation. "Designing for Active Living Among Children." Active Living Research (2007)

   According to the Active Living Research national program under the Robert Wood Johnson Foundation, physical activity levels are a contributing factor in the occurrence of obesity in children (pg 1). According to the U.S. Surgeon General, children should participate in at least 60 minutes of moderate physical activity most days of the week (pg 1). Research shows that children who live in communities which are considered "walkable" and have parks, trails and recreation programs tend to be more physically active than those living in communities with fewer opportunities for outdoor activity (pg 2). One of the most important environments to influence physical activity is schools (pg 3). In 2007, researchers observed K-12 students in the state of California as part of an evaluation of Physical Education courses. This study found that "Low income and minority students received poorer quality PE due to lack of teacher training, large class sizes and inadequate facilities" (pg 3).

Steampfli, Marianne B. "Reintroducing Adventure Into Children's Outdoor Play Environments." *Environment and Behavior.* (2009) vol 41 no 2

   Steampfli discusses the changing relationship between children and outdoor play. She tracks the roots of this change to evolving social relationships and parental concerns over children's safety. It is also noted that changes in childhood media-centered entertainment affects outdoor play. Steampfli suggests that adventure playgrounds can help mitigate this change and encourage outdoor opportunities for play and development.

Sobel, David. *Beyond Ecophobia: Reclaiming the Hearth in Nature Education. Nature Literacy Series*. The Orion Society: Barrington, MA. (1996)

   Sobel suggests that children need to have a local connection, not just global ideas. This means that children need to not only understand the global implications for their environmental actions and global environmental problems, they also need experiences with local environmental problems and solutions (pg 1). He also states that there are developmentally appropriate methods for introducing children to environmental problems. In early childhood, children's empathy towards the natural world should be emphasized and in early adolescence children should be introduced to social action about those environments which they have developed an empathy for in early childhood (pg 12).

Sobel, David. *Childhood and Nature: Design Principles for Educators.* Stenhouse Publishers: Portland, Maine. (2008)

   According to Sobel, there are seven principles that designers should use to create childhood landscapes: adventure and physical challenge (pg 21), fantasy and imagination (pg 24), access to animals (pg 29), creation of paths and mental maps, ownership over place (pg 39), the creation of small "worlds" (pg 46) and treasure hunting (pg 50). Sobel suggests that the "Authentic Curriculum" be utilized and incorporate the seven principles of education design in encouraging an "experience" with nature between the ages of early and middle childhood. Authentic Curriculum calls for individual children's interest to determine the individual curriculum.

The No Child Left Behind Act of 2001. Public Law 107-110. The Department of Education

   The No Child Left Behind Act of 2001 was developed by the George W. Bush administration to address the issues of public education standards and allocation of federal funding to public schools. This act established a link between state set standardized curriculum, standardized test scores, and federal funds.

Thompson, Angela M. et al. "Factors Influencing the Physically Active Leisure of Children and Youth: A Qualitative Study." *Leisure Sciences* (2005). vol 27.

     Angela Thompson et al in their article "Factors Influencing the Physically Active Leisure of Children and Youth" in Leisure Sciences examines the relationship between physical activity and a healthy social, physical and mental lifestyle who's "benefits arise from an increased energy expenditure, which contributes to more efficient body functioning, weight control, reduced risk of chronic diseases, and an overall improvement in quality of life" (pg 421). According to Thompson et al, it is during childhood that people are "socializ[ed]" into becoming physically active during their leisure time "because it is the time when they develop physical activity skills, attitudes, values, and behaviors" (pg 421).Thompson et al notes that people of low-income are less likely to engage in physically active leisure activities due to "registration costs or the distance to travel to the activity" (pg 429). This would seem to suggest that people of low-income often do not have the opportunities for highly active lifestyles due to financial restrictions and lack of recreational programs and activities in their immediate community. Thompson et al also discusses the socialization that takes place in childhood which either encourages or discourages physically active leisure activities. According to this study, "participants in elementary school were most strongly influenced by their parents and their ability and opportunity to play" (pg 434) which suggests that parental activity levels play a dominant role in their children's activity levels.

Verbeek, Peter and de Waal, Frans B.M. "Chapter 1: The Primate Relationship with Nature: Biophilia as a General Pattern." *Children and Nature: Psychological, Sociocultural, and Evolutionary Investigations.* MIT Press: Cambridge, MA. (2002)

     According to Verbeek and de Waal the process of learning and discovering about and from nature through exploration is an important developmental phase of both human children and other young primates. Children learn by exploring boundaries just as other primates do (pg 20).

Weaver, Lisa L. "Learning Landscapes: Theoretical Issues and Design Considerations for the Development of Children's Educational Landscapes." Masters of Landscape Architecture Thesis, Department of Landscape Architecture: Virginia Tech (2000)

     Central focus of study of Weaver's thesis is the importance of "play" and developmental needs of children determining the developmental elements through literature review on child development, educational practices, and practices of play (pg 1) and to display this research in a way that designers can utilize in creating a "holistic design" for children's play (pg 3). Primarily this assumes that play forms are connected to learning and development and that through specific design the experience of the user can be emphasized.

Wesley, Jennifer K. and Gaard¬er, Emily. "The Gendered 'Nature' of the Urban Outdoors: Women Negotiating Fear and Violence." *Gender and Society* (2004) vol 18 no 5

     Jennifer Wesley and Emily Gaarder discuss the socially constructed dangers for women who participate in public space recreation activities. Wesley and Gaarder state that "gender-related feelings of objectification, vulnerability, and fear in this space limit women's participation" (pg 645). Specifically, women's fear of sexual assault and harassment cause women to occasionally avoid recreational activities in public spaces such as parks (pg 645). According to this research, there is a "uniquely therapeutic value of outdoor or wilderness recreation for women in terms of empowerment" however women often "face constraints in natural outdoor space related to the geography of fear in the outdoors" (pg 648). This suggests that there is a gender related disadvantage for women when discussing access and opportunity in outdoor recreation spaces and programs.

Willis, Ray. "Child's Play History." The gypsy poet- journey into the land of freedom. (2009) < http://www.thegypsypoet.co.uk/childs_play_and_their_history_4.html>

      Willis explores the history of children's playgrounds through poem and images. Beginning in the early 1800s, Willis uses historical images and poetry to illustrate different stages in playground history.

Youell, Biddy. "The importance of play and playfulness." *European Journal of Psychotherapy and Counselling.* (2008) vol 10 no 2

      Biddy Youell claims that 'screen-based' activities are causing the "demise of play" for children (pg 121). The purpose of her study is to "locate the origins of play and playfulness as being in a children's early experience and to illustrate the ways in which children's development can be compromised if play and playfulness are not established in those early years" (pg 121). According to Youell play is "a vital precursor of the capacity for work and love" (pg 122). Specifically, Youell defines play as not only the fun and enjoyment of activities, but also as the ability to "think flexibly, take risks with ideas (or interactions), and allow creative thoughts to flow" and furthermore play is a social construction, in which there is a developing relationship between the participants (pg 122). Interestingly, Youell also includes within her definition of play the idea that "play and work are not opposites, nor are they mutually exclusive" and play can be considered a form of learning; meaning that play can be found within work and vice versa and that play situations often afford some type of learning (whether it be physical, mental, or social) (pg 122). Youell concludes that "play and playfulness in a child's early relationships is of crucial importance in the development of… a secure sense of self or self esteem" (pg 126).