

Children's Thoughts and Feelings Regarding Nature in Two Types of Locations

Comparisons and Implications

Children's play environments are undergoing drastic changes. This study compares the thoughts and feelings about nature of 6 to 12 year old children living in mountainous and city regions. The central research question is: What is the impact of location on children's thoughts and feelings about nature? Hypotheses assumed that participants in the mountainous locations would be more connected with nature. Surveys were distributed to a total of 103 elementary-school children (63 children in mountainous; 40 from city). Results illustrated that children in mountainous regions employed more emotion words while children in the city employed more descriptive words to describe their relationship with nature. Compared to the urban sample, participants in mountainous regions felt that their environment was more natural. Recommendations include suggestions for curriculum design and enhanced childhood experiences. It is optimal for parents, educators, and policy-makers to provide frequent unstructured outdoor play opportunities.

Nature is painting for us, day after day, pictures of infinite beauty.

—John Ruskin (1819-1900)

Researchers and child advocates are continually emphasizing the importance of nature in children's everyday worlds, claiming that freedom to explore nature in childhood has long-lasting benefits that can shape a healthy upbringing. These benefits, which range from physical to personal-emotional and cognitive development, illustrate that direct engagement with nature can contribute to a holistic upbringing. (Haluza-Delay; Hamilton, Klebanoff and Sharp; Wells and Evans; Zeece and Wells). So why is nature so beneficial for children? Aside from the obvious physical health advantages of an active lifestyle, researchers

have shown that playing outside and having nature experiences draw on and encourage children's curiosity and reflection and can also promote self-understanding. Developing a connection with nature has also been shown to decrease behavioural aggression and stress levels, cultivate empathy for other living creatures, and increase appreciation for the diversity of life (Hamilton, Klebanoff and Sharp; Zeece and Wells). Forming deep connections with nature in early childhood is equally fundamental for maintaining pro-environmental attitudes throughout one's life (Korhonen and Lappalainen; Van Petegem and Blicek; Orr; Sobel).

A mere two decades ago children spent their time actively playing outdoors, using natural environments as everyday playspaces. But, it's no secret that the meaning of 'childhood play' has taken a drastic shift in the western world (Bonnett and Williams; Pergams and Zaradic 2006, 2007). There are two fundamental shifts that are influencing children's interactions with the natural world. First, the gap between natural environments and children seems to be growing. Statistics Canada reported that the Canadian population living in large cities increased from 54 percent since the Second World War, to a staggering 80 percent in 2006—a 26 percent increase. This rise in urbanization can limit children's intimate, unstructured interactions with the natural world; children in large cities have less access to spontaneous time in nature. Second, television and video games amongst other media influences are dominant in children's modern social world, and children are spending more time interacting with media than ever before. *The Joan Ganz Cooney Center at Sesame Workshop* (2010) report stated that this is especially relevant for the "lower-income, Hispanic, and African American children..." as they "consume far more media than their middle-class and white counterparts" (Gutnick, Robb, Takeuchi and Kotler 25). This socio-economic divide is significant and will be examined in more detail later. While modern societies are benefitted in numerous ways by children's increasing media literacy, the correlation between media aptitude and disengagement from the natural world is distressing (Bonnett and Williams; Pergams and Zaradic 2006, 2007).

As Rhonda Clements pointed out,

children in Canada spend on average less than 10 hours per week participating in outdoor experiences, versus 20-30 hours per week indoors engaged in non-vigorous activity. (69)

Thus, the objective of this study is to question whether children living in large cities have similar understandings and perceptions of nature as children living in mountainous environments. Do children in these two types of regions choose different words to express their thoughts and feelings about nature?

Defining Terms

Nature: For the purposes of this study, “nature” is defined as: “all animals, plants, rocks, etc., in the world and all the features, forces and processes that happen or exist independently of people, such as weather, the sea, mountains, reproduction and growth” (*Cambridge Dictionary*). Or in other words, nature could simply be defined as non-human made materials. Nature is further qualified in this study by an understanding of “access.” While there are natural processes occurring all the time and in every location, children living in high density urban centers have different access to “nature” (that which is independent of people) than children who live in less densely populated areas with greater prevalence of natural flora and fauna. It should be clarified that while the researcher recognizes that people are an important part of the interconnected ecosystems of the natural world, the aims of this study are clarified by a definition of the natural world of that which is not necessarily *dependent* upon the actions of human beings.

Urban/City Environments: For the purposes of this study, urban environments are defined as locations that are highly-industrialized and densely populated in which are structured and built by human beings. In reference to this particular research study, urban environments are settings in which families do not have ready access to mountainous regions or other wilderness settings, such as forests or large parks. In this particular study, the city that was surveyed included downtown Toronto.

Mountainous Environments: As opposed to urban settings, mountainous environments are defined as locations that are situated near wilderness areas, including forests, parks and mountains. For this specific study, families living in mountainous areas are situated near two mountainous regions including the towns in the Adirondack Park and Canadian Rockies.

Research Methods

The study was undertaken with a total of 103 elementary-school children (aged six to twelve years) in two mountainous regions and one metropolitan city center (63 children in mountainous; 40 from city). The number of participants between the locations is varied due to school enrolment and student willingness to participate. The schools in the mountainous regions were chosen on the basis of their proximity to mountain parks. In contrast, the central city school was chosen because it is within a large metropolitan area. Three schools in all participated.

Each student was given a survey, which included a combination of multiple-choice and open-ended word listing questions (Cohen, Manion and Morrison).

The surveys consisted of three questions intended to measure the thoughts and feelings that children have regarding nature. These questions examined words that come to mind when thinking about nature, how much a part of nature the participant feels, and how much a part of nature they feel their home is. The survey questions were taken from a section of Robert Rinkoff and Alison Gaston's research study on children's relationships with the mountain environment, entitled, "*The child's proximity to mountains as a predictor of environmental intimacy: Implications for stewardship.*"

The *triangulation design* was used for data analysis, where qualitative and quantitative data were analysed separately and then merged for direct comparisons; allowing the strengths of both tools to be present (Creswell). The mixed-method design provided the opportunity to establish both validity and reliability as well as achieve credible results. Further, the analysis of the qualitative and quantitative data is separate to determine if these designs support each other and the final conclusions (Creswell).

Qualitative analysis was used in order to illustrate the words that participants most frequently used. Including the words that were frequently used by the participants allowed for greater support in the validity and reliability. For the open-ended question "please think about nature: what words come to mind," qualitative analysis began by sorting the children's responses into seven categories: emotion words, animal words, plant words, element words, descriptive words, action words as well as the total number of words that each participant took to answer an individual question. The total frequencies were noted for all the children to discover which words were the most popular in each area. Quantitative analysis was used both for open and closed-ended survey questions, including T-Test Inferential Statistics (correlations and significance) as well as Pearson Chi-Square analysis.

The independent and dependant variables were noted in this study. The independent were defined as the two types of physical locations where the participants live; the dependent variable was identified as the participant's thoughts and feelings regarding nature in their everyday lives.

Prior to the study, it was hypothesized that geographical location influences the thoughts and feelings children have towards nature. Children living in mountainous locations were predicted to be more at ease with nature and to have a stronger relationship with nature than the children living in the metropolitan center.

Findings

The impact of location on children's thoughts and feelings towards nature

The major component of this analysis consisted of calculating children's

responses to the “name the words that come to mind when thinking of nature” survey question. Comparisons were completed by tallying the total amount of words in each of the seven identified categories, and noting the top three words used. Additionally, comparisons were made by conducting *T-Test* statistics between the mountainous and urban areas to find out if the results are statistically significant. As for the closed-ended questions of “how much a part of nature do you feel you are” and “how much a part of nature do you feel the place where you live is,” *Pearson Chi-Square* analysis was used.

Top Three Words

The participating children from both areas used *tree* most frequently, with 47 counts. Words categorized as *animals* (with 42 counts) and *flowers* (with 23 counts) came in at second and third place. As indicated below in *Figure 1*, the top three words in each area were quite similar across all participants. All three words were listed as the most popular, but placed in different rankings. As *animal* was in first place in the urban area, it went down to second place in the mountainous regions. On the contrary, *tree* was placed second in the urban area and was moved up to first in the mountainous regions. Finally, *flower* stayed in the third ranking in both areas.

City/ Urban Area		Mountainous Area	
WORD	NUMBER OF COUNTS	WORD	NUMBER OF COUNTS
Animal	23	Tree	27
Tree	20	Animal	26
Flower	18	Flower	10

Figure 1: Top 3 Words in Each Area for Children

T-Test on Open-Ended Question

T-Test inferential statistics were completed on both regions for each word category. As shown in *Figure 2*, results indicate a significance of $p=0.05$ for the *emotion* words with the average significantly higher in the mountainous regions than the urban region. Additionally, it is concluded that there is a strong significance of $p=0.03$ for the *descriptive* category in the urban area in comparison to the mountainous regions. These results illustrate that children

in the mountainous regions expressed more *emotion* words (such as “beautiful,” “amazing,” or “free”) than the children living in the city. Children in the city used more *descriptive* words (such as “tall,” “big,” or “green”) in comparison to children living in the mountainous regions. Otherwise, there are no significant differences between the types of words used in each location.

Children's T-Test Results (Mountain vs. City Environment)

Type of Words	Areas	N (Number of Words)	Mean	1 – Tailed Significance Level
Emotion	Mountain	15	2.00	0.05
	City	11	1.00	
Animals	Mountain	41	1.76	0.48
	City	27	1.74	
Plants	Mountain	39	2.08	0.37
	City	28	2.00	
Elements	Mountain	16	1.44	0.24
	City	22	1.64	
Descriptive	Mountain	18	1.33	0.03
	City	11	2.00	
Action	Mountain	5	1.20	0.5
	City	5	1.20	
Total	Mountain	63	6.16	0.32
	City	40	6.63	

Figure 2: Children's T-Test Results

Chi-Square Closed-Ended Questions

Pearson Chi-Square analysis of the closed-ended questions revealed insignificant ($p > 0.05$) results for the children's question of “how much a part of nature do you feel you are.” As *Chart 1* illustrates, there was not a significant difference between the answers that children gave in the urban and mountainous regions: location did not play a major role in establishing a child's perspective towards their own relationship with nature in this particular sample. However, results changed for the question “how much a part of nature do you feel the place where you live is” where the *chi-square* results indicated a strong significance ($p = 0.00$). Specifically, 45 percent (28 out of 62) of children in the mountainous

regions stated that their home surroundings are *completely a part of nature* and 41 percent (26 out of 62) stated that their home surroundings are *very much a part of nature*. This contrasted with the children living in the urban area, where the majority (53 percent, 21 out of 40) of the children considered their home surroundings to be *a part of nature a little bit*. As these results indicate, children living near the mountains feel that their home is related to nature far more significantly than children located in urban areas.

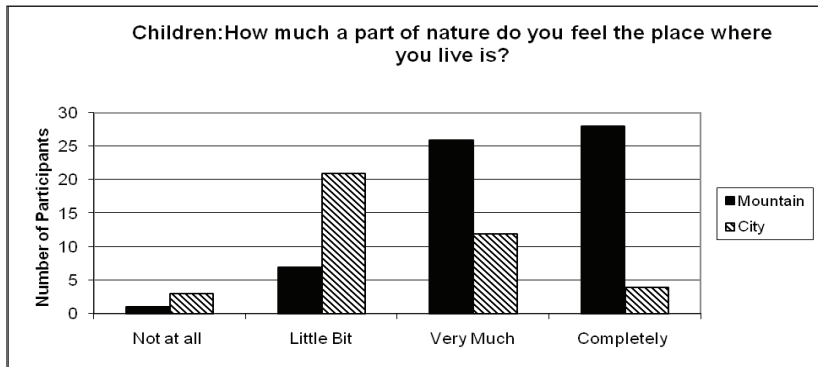


Chart 1.

Discussion

Impacts of location on children's thoughts and feelings towards nature

The results of this study showed that children in the mountainous areas expressed more *emotion* words while describing nature. The methodology of this study assumed that children in mountainous areas typically have more visual exposure to nature while going about their daily routines, and forests, mountains and/or parks are more readily accessible than in urban areas. This 'ease of access' can potentially influence the emotional relationship children have with nature. In comparison, urban children may rely more on second-hand learning about nature through class curriculum and less on direct experiences. Michael Bonnett and Jacquetta Williams in addition to Richard Louv and David Sobel, have suggested that classroom experiences are too restrictive and infrequent in order to provide urban children with nature experiences comparable to those of children in more rural areas.

The survey question, "how much a part of nature do you feel?" aimed to find out if a child perceives him/herself as being connected with nature. It was hypothesized that children in the mountainous areas would relate themselves with nature more so than the children living in city locations.

However, results illustrated otherwise and no major distinctions about the two locations were seen.

These results are contradictory to that of Peter Van Petegem and An Blicek's (2006) study of comparing environmental worldviews of children living in Belgium and Zimbabwe. Their study found that children in Zimbabwe displayed a "human-dominance" perspective while children in Belgium considered themselves more equal with nature (Van Petegem and Blicek). In the present study the "technology accessibility" variable was not controlled and it was assumed that the children in both the mountainous and urban areas had roughly equivalent levels of access to technology. As Bonnett and Williams claim, technology such as films, the news, video games, and the internet, increasingly impact children's perceptions about nature. By interviewing several lower-elementary school students, Bonnett and Williams found that some participants did not regard humans as part of nature and suggested that television programs played a large role in forming perspectives about nature. The present study adds nuance to Bonnett and Williams' results as there was a significant difference between children from mountainous and city environments when answering the question, "how much a part of nature do you feel the place where you live is." This divergence illustrates that children are aware of the connection between their home communities and the natural world.

Childhood is a Fundamental Time

As a result of past research studies (Bonnett and Williams; Wells and Lekies; Van Petegem and Blicek; Zaradic and Pergams), it was hypothesized that geographical location influences the ways in which children think about nature. However, increased access to wilderness areas cannot entirely account for the establishment of emotional bonds with nature. This requires opportunities to learn in and with nature, to use the imagination and to create the kinds of meaningful experiences that playing freely in nature can provide (Sobel). As article 31 of the *Rights of the Child* specifies, "children have the right to engage in free play, leisure and participate freely in cultural rights and imagination" (LOHCHR). Nature provides a child with the opportunity to explore, and taps into their imagination and creativity, providing physical and psychological health for a healthy upbringing. As relevant for all individuals, it is a child's right to interact with nature on a consistent basis.

In his book *Earth in Mind*, W. David Orr states, "we will not save what we do not love" (140). If we take this premise seriously then we cannot deny the import of personal experiences which develop the love of nature. Early childhood is a critical time in an individual's life where a child explores the world around them and establishes the base for future values. Dr. Fraser Mustard, a well-known Canadian physician, supports this fact by his research on the plasticity

of the brain and the importance of exposure in early childhood, stating that there are *critical* periods in a child's life for brain development, where a young child needs environmental stimulation for a healthy development (touch, smell, visual, auditory). Children need the opportunities to explore. (McCain and Mustard). Sobel claims that early childhood experiences of caring for the natural world exert an influence throughout the rest of life: "...if we want children to become environmental stewards, then one of the best things we can do is let them play in natural settings" (11). Many famous examples can be evoked to support this point. For example, celebrated environmentalist Aldo Leopold describes his childhood as having been largely spent exploring the "marshes and woods along the Mississippi River" (qtd. in Orr 143). American biologist and environmentalist E.O Wilson claimed the status of scientist at an early age by examining the woods and swamps of a nearby forest (cited in Orr). Add to this your own example. Do you love the natural world? Consider yourself to be environmentally responsible? Regardless of how you answer, ask yourself "how did you spend your childhood years?" What experiences connected or alienated you from the natural environment? And how do these experiences continue to impact you today?

Motherhood, Nature Accessibility and Implications

In comparing the "buffering" effects of nature on children living in downtown areas, Nancy Wells and Kristi Lekies found that natural spaces are less accessible to children living in low-income households, whether it be in urban *or* rural contexts. Families with lower levels of income may not only have less time to spend exploring nature with their children, but may also have decreased access to natural landscapes (Faber, Wiley, Kuo and Sullivan). A 2007 *CBC NEWS* report indicated that 30 percent of Toronto families live in poverty and "more than half of all single-parent families [in Toronto] were low-income in 2005." These rates are on the rise ("Poverty Increasing in Toronto, Report Says"). Thus, many families living in the city cannot afford to expose their children to the natural world, which is relevant to the urban sample of this study.

Jacki Guendouzi, as well as Barbara Morgan and Laura Hensley, point out the feelings of guilt that parents, particularly mothers, encounter when not being able to fit the stereotype of the "perfect parent." Even though women today have greater opportunities to enter the workforce on a fulltime basis, the perceptions of the "perfect mother" in the Western world is still attached to the traditional understandings of intensive mothering (Guendouzi). This results in feelings of guilt and shame when not being able to meet an unrealistic ideal of parenthood. This is especially relevant to low-income single parents, as their time is acutely limited. It is crucial to realize these barriers while dis-

cussing the importance of the natural environment, as some families do not have the freedom of choice to expose their children to such opportunities. It is not in anyone's best interest for environmental access to become yet another bullet point on hurried parents' "list of things about which to feel guilty and inadequate." It is therefore essential to develop environmental curricula and "at-home" activities that are accessible and take into consideration the circumstances of all kinds of families.

Limitations of the Study

Due to time constraints and a lack of resources and funding, this study was limited in the following ways:

Limited Number of Questions. The data analysis was based on a total of three questions. Since the data collection was taken from a survey that was based on children's relationship with *mountains*, only a limited number of questions could be taken that were relevant to the specific research question. Therefore, a set of more diverse questions is needed in order to improve the research study. For instance, questions that explore participants' valuing of nature would be beneficial (e.g., "do you think nature is important?"), as well as questions that deal with educational and behavioural influences (e.g., "where do you learn about nature?").

A Reflexive Methodology. Surveys consisted of multiple-choice and open-ended questions. In order to gather richer and more detailed data from a mix-method and reflexive methodology, a greater variety of responses are needed, such as asking participants to engage in drawings and individual or group interviews.

Participants. Due to the fact that the research survey was voluntary, there were uneven numbers of participants between the two areas. This could skew the data in such a way that it will result in an unrepresentative number of participants in each area.

Recommendations for Future Research

Based on these illustrated results and methodological limitations, additional research studies need to be conducted:

- 1) This study discussed the relationship children have with nature in city and mountainous areas. However, as discussed, families living in lower-income households may not have the same opportunities to expose their children to nature. It would be useful to nuance the data by including information on household income levels. Although this is sensitive data it could afford insight in the significance of socio-economic status on children's relationship to nature.

Specifically, it would be useful to research the attitudes towards nature that are developed by children living in low-income and affluent households.

2) This paper also suggested that becoming connected with nature requires more than living in a natural setting. Children need to freely explore natural environments, engage their creativity and imagination to form strong bonds and “love” for nature. Further studies are needed to explore the types of encounters and qualities of experiences children have with nature and the specific impact that these experiences have on attitudes and behaviours. This kind of research would be best served by a longitudinal study and therefore requires a dedication of time and resources that is seldom available.

3) The parental perspective on connecting children with nature has rarely been included in environmental education research. Case studies that include the personal stories, experiences and struggles of raising children close to the natural world could provide a heretofore mostly excluded perspective on this growing area of research.

4) Exploring how school curricula and teaching styles affect children’s relationships with the natural world continues to be significant for this area of research, given the prominent influence that schools play in children’s upbringing. An important future avenue of study lies in comparing various approaches to schooling, such as examining environmental education in *Steiner-Waldorf* or *Reggio Emilia* schools in contrast to the mainstream school system.

5) Lastly, the sample of the present study focused on children from six to twelve years of age. It would be especially valuable to investigate children’s attitudes prior to the age of six, as this is where notions and values about the world begin and it is a gap in the current child-centered research.

This study serves as an important guide for parents, educators as well as policy-makers. It underlines the importance of direct-nature experiences in children’s lives. In order to deepen the relationship of urban children with nature, curricula need to be modified in order to include positive, long-term, direct-experiences with nature. Due to the overwhelming requirements, curriculum standards and pressures that teachers face in today’s education system, opportunities to ‘go outdoors’ might be restricted. Curricula that ties learning activities and outcomes to outdoor activities are needed. Take for instance Roberta Bondar’s new initiative that integrates artistic expression with environmental and scientific education. In this project, teachers ask students to find an aspect of nature that they consider beautiful (developing an affective association with the natural) and to identify what aspects of science they can see functioning in this part of the natural world. Students are then invited to photograph this aspect of the natural world. In schools where resources do not allow for camera to be provided to all students, the project could equally have students drawing pictures of nature. David Sobel

further explores these ideas in his book, *Childhood and Nature: Design Principles for Educators*.

It is optimal for caregivers to provide opportunities for children to play unstructured activities outdoors. But as this paper discusses, this may not be realistic to the majority of working parents, single mothers and/or lower-income families. Yet, past literature (Wells and Evans) points out that it is especially crucial for children living in high-stress environments to be directly exposed to nature. In such situations, spending unstructured leisure time in nature is yet another privilege that may not be available, and parents may develop feelings of guilt when they cannot provide this for their children on a regular basis. Fortunately, many urban citizens are working to ensure that more “green” opportunities are being provided in city centers, including shared community gardens, and child focused non-profit green organizations. However, creativity is needed in order to ensure that these kinds of opportunities continue to be valued and fostered in the “concrete jungle” of urban centers. How can young people be encouraged to see the plant life that flourishes in cracks in the sidewalk as an important part of a vastly interconnected ecosystem? How can window box gardens become sources of nourishment and wonder? How can clouds and wind become significant in our understandings of our situatedness in “nature,” even in the most urban of settings? How can we imagine the earth underneath the road? Can these kinds of creative engagements help to alleviate the guilt experienced by parents who otherwise feel that their circumstances are such that they are “failing” their children by not providing significant access to “nature”?

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