Learners Engagement During a Novel Residential Environmental Education Experience: The Influence of Personal Histories on Interests, Identities, and Stewardship

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Abstract

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Environmental education is focused on producing informed citizens capable of stewarding the natural world. In the past, there has been little understanding of how participants' personal histories interact with environmental education experiences. This dissertation examines how participants' cultures and lived realities interact with a unique, annual residential environmental education program that engaged youth in novel experiences in a semi-pristine wilderness. This research took place over two-years, using ethnographic methods, including; participant observations, artifact reviews, and post-experience interviews. This dissertation consists of three analytical chapters focused on different learning and educational issues. The research questions that each chapter addresses are as follows:

1. How do the experiences of students differ during a 5-day residential environmental education program? How do student's prior knowledge and experience with nature affect their connection to the environment?

2. How does the residential environmental education experience change student's connection to the natural world, in terms of environmental interest, stewardship, and identity?

3. How does the recognition or lack of acknowledgment of participant's cultures and lived realities affect their residential environmental education experience?

These chapters serve to provide new ways to empirically understand a residential experience and its outcomes. Specifically, how an individual's cognitive, social, and cultural experience affected their learning process in a residential environmental education setting. Chapter two provides the first empirical understanding of participants' different interaction stances with the natural world during a residential program and how those stances were tied to participants' prior knowledge, experience, identity and interest. Chapter three describes changes to participants attributed to the residential program in terms of identity, interest and stewardship. These variables have not been previously considered together in understanding residential program impacts. The fourth chapter fills a void in research by providing an empirical understanding of the intersection of participants' lived realities with the residential program.

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It truly took a village to finish this dissertation.

Dedication

To my mom who taught me about unconditional love and laughter.

To the youth, may you not only learn from our mistakes

but also make the necessary course corrections.

Introduction to Dissertation

Environmental degradation in the United States in 1970's led to an environmental movement, environmental policies being created, and the foundation of an environmental education association, the North American Association of Environmental Educators (NAAEE). The purpose of the NAAEE is “achieving environmental literacy in order for present and future generations to benefit from a safe and healthy environment and a better quality of life” (NAAEE, 2011). Within environmental education it has been acknowledged that its goal of producing a more pro-environment populace is not being met (Heimlich, 2010; Orr, 2004). To quote David Orr, a leader in environmental education, “despite occasional successes, overall we are losing the epic struggle to preserve the habitability of the Earth” (David Orr, 2011, p. 57). This dire reality requires a deconstruction of environmental education to understand how it, as a discipline, can achieve its desired results.

I have been teaching college level natural science for many years. In that time I have frequently had advanced level college students express to me; that they had no idea that mass extinctions are occurring, that the human population is growing exponentially, that humans are consuming and destroying natural resources beyond replacement rate, and ultimately that we are not living sustainably. I remember a decade ago, during a discussion about our current mass extinctions in a Conservation Biology course I was teaching, an older returning student asked me incredulously, 'why did I not know this before?' My student’s epiphany at once made me feel excited, hopeful and concerned. She now had this knowledge, but she also led me to wonder

how many students with baccalaureate degrees, among the more educated in this country, never learn that humans are living unsustainably?

My anecdotal information about college student's point to a lack of ubiquity in environmental knowledge. However, is this lack of basic environmental knowledge what is preventing environmental education from attaining a more sustainable populace? Does knowledge about the environment bring about behavior change? At a time when the phrase "nature deficit disorder" (Louv, 2008) is used to describe our decreasing interaction with the natural world, can environmental education provide opportunities to connect to the natural world and inspire stewardship? There are large discrepancies in how and how often youth experience the natural world. This disparity along with a multitude of cultural ways of understanding the natural world, creates youth on a continuum from those not engaged in learning about or experiencing the natural world to those highly engaged.

The following dissertation looks at the history and current state of environmental education and exposes some of the assumptions within the discipline that have contributed to its lack of effectiveness and inclusiveness. My research is based on a residential environmental education program in the Northwest United States. I was fortunate to be given the opportunity to conduct research on this residential program and to use it as a research context to better understand how individual's background and motivations affect their experience and outcomes. This research fills voids in the literature on how individuals' backgrounds, cultures, and lived realities interact with the context of a residential environmental education program. It also provides critical perspective of these interactions for individuals from populations underserved by environmental education in the past. A description of the study rationale and design follow.

Rationale for Study

Some tacit beliefs still within environmental education may be hindering environmental education's effort to create an environmentally concerned populace. These unquestioned beliefs, as I explain further in Chapter 1, include the belief that there is a "one size fits all" learning experience for anyone attending an environmental education program; that there is direct relationship between environmental knowledge and environmental behavior; and that exposure to natural spaces automatically leads to a connection to that space and ultimately a desire to protect it. Research has shown that these assumptions do not hold true even though they remain prevalent within environmental education.

Misguided assumptions about environmental education have also prevented environmental education programs from becoming more inclusive. Many have criticized environmental education as being historically White, middle class in constituency and focus at the exclusion of diverse voices (Grass & Agyeman, 2002; Lewis & James, 1995). People within non-dominant populations are often the most impacted by degraded or polluted environments (Grass & Agyeman, 2002) and have the least access to the positive impacts of natural spaces, such as increased ability to concentrate and reduction of stress and aggression (Faber Taylor & Kuo, 2006; Strife & Downey, 2009). This disparity in access to the benefits of natural spaces and consequences of a polluted environments, increases the necessity of making environmental education relevant to those communities.

Also contributing to the lack of inclusiveness of environmental education has been the relatively homogenous quantitative approach to research on outcomes with little understanding of what led to those outcomes (Hart & Nolan, 1999; Rickinson, 2001; Stevenson & Dillon, 2010). Using a sociocultural learning framework to study an environmental education

experience can expand our understanding of outcomes beyond what happens to why they occur—as it allows for an investigation of the cultural histories and the meanings that youth have with the natural world and environmental education experiences. That understanding could potentially lead to improved experiences, especially for students in populations previously not served by environmental education.

There has been little use of a sociocultural perspective in environmental education research and even less for residential environmental education experiences, where individuals stay overnight from one to several evenings in a semi-natural settings. The sociocultural perspective acknowledges that the context from which the student comes affects their learning experience. This study addresses the lack of understanding of how participants' backgrounds and lived realities affect how they experience and what they take away from an residential environmental education program, particularly, for participants from populations previously excluded or underserved by environmental education.

Research Focus and Questions

This dissertation focused on how student's prior experience in nature, knowledge, and culture and lived realities interacted to affect youths' connections to the environment and how they experienced a 5-day, out-of-state residential environmental education program within Yellowstone National Park. There currently is a lack of understanding within the research literature of how participants prior context and interaction and knowledge of the natural world affects how they experience a residential program and what they take away from it.

For this dissertation I utilized an ecological learning framework and focused on how students' background and culture and lived realities affected their connection to the environment

and thus their residential environmental education experience and outcomes. This framework takes into account “cognitive, social and cultural learning processes and outcomes that are shaped by distinctive features of particular settings, learner motivations and backgrounds, and associated learning expectations” (Bell, Lewenstein, Shouse, & Feder, 2009, p. 31). To date, this comprehensive ecological framework has not been applied to a residential environmental education program.

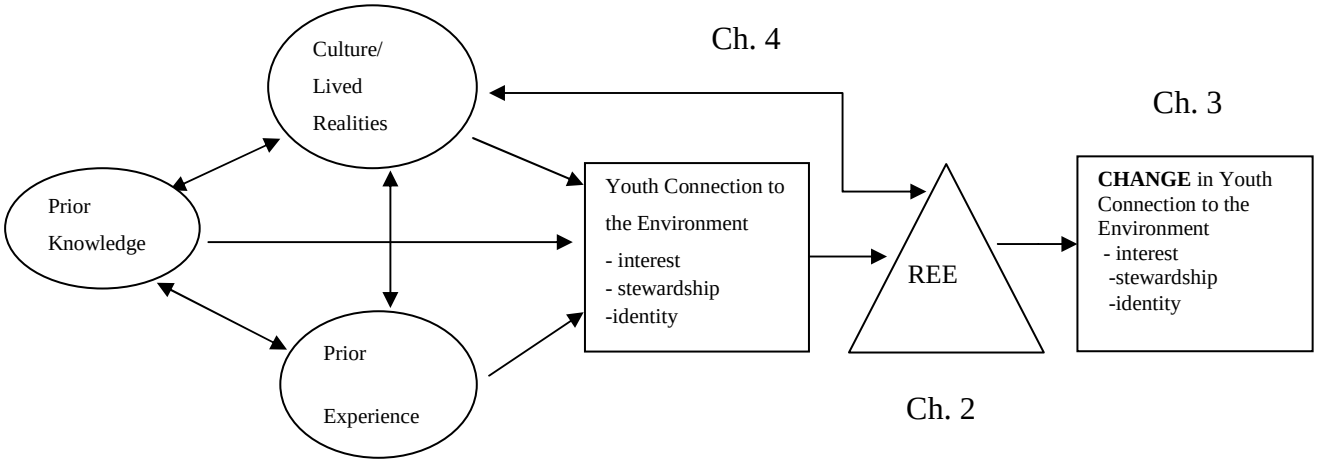
Also part of the analytical framework were variables found to be important for environmental connection in previous environmental education studies, including students’ experience and knowledge of the natural world. Environmental connection was defined in this study in terms of each student’s identity, interest, and stewardship. Interest and identity, according to a research synthesis of science learning in informal environments (Bell, et al., 2009), are two of the six strands of learning in informal settings while stewardship is the ultimate goal of all environmental education programs.

In this study, it is recognized that youth have multiple cultural identities. Culture is operationalized as "shared routines, practices, and beliefs" (Lee, 2008). This study focused on students’ identities in relation to science, the environment, and the National Park they visited and whatever identities appeared to be affected by the residential experience. Where appropriate, Hidi and Renninger’s (2006) four-phase model of interest development was used to categorize levels of interest expressed through student actions and statements. Stewardship in this study, was defined as behaviors or attitudes focused on preventing environmental degradation.

Below is the conceptual map of components of the children's prior knowledge, experience, culture and lived realities that interact to create their connection to the environment. This study attempted to discern, how a student’s prior environmental connection affected their

residential environmental education experience and how the student's cultures and lived realities played a part in their residential environmental experience. The outcomes assessed were the changes in the student's environmental connection in terms of interest, identity, and stewardship after the program. The chapters have been added to the concept map to show where the analysis resides.

Concept Map



Research Questions

This dissertation addresses the unique experiences of participants during a residential environmental education program and how their experiences were influenced by their context and the context of the program itself. Chapters 2 through 4 address the following research questions respectively:

> 1. How do the experiences of students differ during a 5-day residential environmental education program? How do student's prior knowledge and experience with nature affect their connection to the environment?

2. How does the residential environmental education experience change student's connection to the natural world, in terms of environmental interest, stewardship, and identity?

3. How does the recognition or lack of acknowledgment of participant's cultures and lived realities affect their residential environmental education experience?

Research Design

This study used qualitative, ethnographic methods. Ethnographic methods were appropriate because the research focused on "what meanings different actors are making of a situation" and took into consideration culture and situational complexities (Green, Camilli, & Elmore, 2006, p. 282). This qualitative approach allowed for the examination of interactions of different dimensions of learning and life experience in a complex setting (Denzin & Lincoln, 2008) and focused on the empowerment of non-dominant voices by representing participants' perspectives of their experiences (Cook –Sather, 2002). These characteristics of qualitative research made it suitable for this study.

Specifically this study was a critical design ethnography which " sits at the intersection of participatory action research, critical ethnography, and socially responsive instructional design" (Barab, Thomas, Dodge, Squire, & Newell, 2004). This researcher took an active part in the environmental program under study and the research questions were informed by critical theory. The research findings were used to suggest changes (Ch. 5) that were shared with stakeholders and can inform future program design.

Researchers Position Statement

There is a recognition by some in environmental education that "researchers cannot be neutral in their work and that their background and biases affect what, who, and how they

research" (Stevenson, Dillion, Wals, & Brody, 2013, p. 516) . As a qualitative researcher, it is important to reveal my motivations, biases, experiences, and perspectives that influenced how I have approached my research questions and focus (Maxwell, 2005). This position statement thus provides personal reflections about how my background and previous educational, professional and personal experiences have influenced this research.

I fell in love with the natural sciences at a young age and by high school, I knew that I wanted to go to college and study biology. I went on to earn a Baccalaureate and a Masters degree in the biological sciences. Not all of my early experiences as a student, however, affirmed my aspiration to become a natural scientist. During my graduate studies, I learned that I did not 'fit' what a natural scientist was supposed to be. The university program I was a part made clear the separation between science and activism. I wanted to be a biologist *and* an advocate for the natural world. I saw the destruction of the natural world as something that needed to change. The mass extinction that humans were creating was something I saw as an ultimate injustice and I wanted to do my part to stop the destruction.

I decided that I would try to combine my passions for science and activism within academia as an educator. I carved out a space in academia where I thought I could remain true to my belief that expanding knowledge about how the natural world works and how we are negatively impacting it is what is necessary to create change. I later came to see this belief as my own misconception, a misconception that continues to be held by many other educators, natural scientists, and environmental educators today. I have been working in higher education and in the natural sciences now for two decades. That experience has reshaped my beliefs and I now see that it will take more than knowledge to create change, that cultural and structural changes also need to happen.

As a first generation college student it was easy for me to believe in the myth of meritocracy when I began my college journey. The meritocracy myth is that institutions of higher education are equally accessible to all who have the skills necessary to be there, and social and economic capital do not play a part in who gets in or who succeeds. While studying and working in academia, I came to understand that the university plays a primary role in the reproduction of existing cultural norms, structures, and hierarchies and for the most part, they were not designed to create radical or abrupt changes (Freire, 2000).

Thus I began to see the educational structure as something contributing to social, political, and environmental inequity or, at a minimum, complicit in not changing these inequities. That led to a desire to create educational change and why I started my journey for a PhD in education. My education coursework allowed me to see the inequity in higher education as an issue that begins many years earlier and that is strongly tied to the messages and roadblocks that youth are experiencing throughout their educational journey. I began to see that higher education disparities needed to be addressed within primary and secondary education systems also.

I was fortunate to find a research subject that tied together my two passions, the plight of the natural world and working with youth from underserved populations. These two subjects are very much linked as the prevailing cultural norms-norms that validate and, oftentimes, endorse the destruction of our natural environment- need to be challenged by new voices, those who have not been heard enough throughout the education system.

I feel privileged to have been a part of this research and this residential program. For me that privilege came with the responsibility to do what I could to not be a burden, and instead try to be helpful to those facilitating, financing and experiencing the environmental education

program. There were many stakeholders in the program, beyond the participants. These stakeholders included anonymous donors, employees from the community youth organization, instructors from a non-profit organization affiliated with the National Park, and the National Park staff . My attempts to be helpful ranged from holding debriefing sessions about the environmental education experience with stakeholders; assuring worried parents; going a day early to buy the groceries for the group for the week; helping organize the education experience; leading a field trip; answering participants' questions; and engaging participants in games of hacky sac.

My interactions with participants involved multiple transitions, from an observer to an instructor, and an instructor to a chaperone. The observer position did not last much longer than the first field trip and quickly moved to more of an instructor role. That was easy for me, as the subject matter of the natural world is something I love to teach about, and have taught for many years. The chaperone role was the most challenging for me, as it increased my level of responsibility to the participants, and it is not where I am a subject matter expert. I recognized the chaperone role also provided me a different level of access to participants' thoughts, concerns, ideas, and beliefs. To be clear, I did not take on the chaperone role to elicit information from participants, but out of the necessity of having another adult to ask questions of, take direction from, and with whom to share concerns.

I was aware of the power difference between me as researcher and those participating in the research. I did attempted to decrease the imbalance by being honest in my discussions, questions, and interactions. However, I did not share my personal history and background with the youth. The families and participants were told both of my role as a researcher and graduate

student and they were also made aware that I work at a local University in a natural science program.

Several of the participants were very forthcoming in discussing their lives. Some of the biggest insights into their realities happened in spaces where they were sharing out about personal thoughts, feelings, and family realities. I feel these insights were shared with me as an adult they could trust, and as such many of those personal realities are not mine to share.

Twenty years ago, I heard the message that you could not be a natural scientist and an activist for a more sustainable world. However, we are at a potentially critical time when some are arguing, and I also believe, that all education, not just environmental education, should be focused on creating sustainable citizenry and to do that there needs to be a transformation within disciplines and the education structure itself (Orr, 2004; Stibbe, 2009).

I feel my journey has paralleled that of environmental education. We began by trying to disseminate knowledge to create change for a more sustainable world, and realized that more than knowledge was needed. Structural changes have to happen along with the inclusion of more voices. In the conclusion of the International Handbook on Environmental Education, the editors state their hope for environmental educations future. I hope this research is a part of that future.

> to see environmental education research break away from the classic separations of disciplines, generations, cultures and formal, informal, and non-formal learning, and reveal more compelling possibilities for addressing sustainability issues and the challenges of learning to live more sustainably.
>
> (Stevenson, Dillion, Wals, & Brody, 2013, p. 516)

Structure of the dissertation

The first chapter of this dissertation serves as an overview of literature informing the questions and conceptual research design. Chapters 2 through 4 are written as standalone articles, thus there is a redundancy in discussion of theoretical framework and methodology. Chapter 5 is a synopsis of how learning theory and this empirical research can inform the specific residential environmental education program being studied and environmental education.

Synopsis of Chapters

Chapter one describes past and present approaches to environmental education and efforts among U.S. environmental educators to transform our population into one that is more environmentally sustainable. The focus of environmental education has been to try and increase human knowledge and to change human behaviors and attitudes about the environment. This chapter discusses some of the embedded beliefs in environmental education that may have prevented it from attaining the goal of a more environmentally friendly populace. There is also a critical lens applied to how the constituency and focus of environmental education has not been inclusive, and how some of the tacit beliefs may have contributed to the lack of inclusiveness.

In Chapter 2, I describe the experiential differences of participants of the residential environmental education program. Three categories of interactions with the natural world were observed and described and varied in number of individuals in each group. These categories or stances were “engaged,” “visitor/viewer” and “social.” Two individuals exemplifying each group are used to describe each category of interactions and to distinguish each category from the others. The individuals’ prior knowledge and experience, interest, and identity are discussed. For a few "engaged" student's, interacting with the natural world was a primary focus, for a

majority the National park was experienced merely as an opportunity to see nature, which fit the "visitor/viewer" stance. And for handful of students, in the "social" category the residential environmental experience was primarily used as context to interact with peers.

Chapter 3 contains the post-experience interview data of seven participants per each year of this study. It describes changes in participants interests, identity, and stewardship desires after the residential program. It also describes participants who experienced changes in perception or no changes at all after the residential program. Also discussed is what triggered participants to revisit the experience, and how the experience affected their connection to science and school.

Chapter 4 describes how participants lived realities interacted with the residential program. Aspects of the residential program physical set up clashed with some participants lived realities. While for others the vast difference of their daily lives from the National Park translated into seeing it as a peaceful place or full of nothing. The social dynamics created during residential programs served both as a highlight and sometimes as a negative experience. This chapter describes episodes which highlight the need to facilitate interactions, create space within the program for participants lived realities, and to facilitate discussions of race and ethnicity.

Chapter 5 explores how the findings and learning theory can be applied to this residential program. It also proposes future design based research studies to improve other residential environmental education programs.

Chapter 1

Environmental Education: Purpose, Critique and Non-Dominant Populations

Introduction

There are a multitude of types of environmental education programs and curricula in formal and informal learning environments. The overarching goal for environmental education has been described in many ways; such as the creation of informed and sustainable citizenry, a pro-environmental or environmentally friendly population, or environmental stewards. Implicit in this goal, is that people who become informed by environmental education about environmental issues and about how humans are intractably dependent on the natural environment will change their behaviors and actions to become stewards.

In an attempt to understand why, after several decades of effort, environmental education is not reaching its ultimate goal of a environmentally literate populace, this literature review focuses on what previous research has shown about the steps toward that goal; changing knowledge, attitude and behavior via environmental education experiences. Research has shown varied results and has uncovered some embedded beliefs that exist within environmental education. These will be discussed in the following sections.

Research on Learning about the Environment

Individual Knowledge Gained

Prior to the 1990's, environmental education literature used predominantly quantitative methods of inquiry because of a strong applied science influence. Research was in the positivist

tradition and focused on controlling and manipulating variables to determine what led to environmental stewardship (Hart & Nolan, 1999). During the 1990's environmental education research expanded to include a variety of methods and perspectives, including quantitative and qualitative methods and post-modern, interpretive, and critical perspectives. This expansion of methodology and perspective allowed for some answers to questions about why or how learning, attitude, or behavior change was occurring and what students were experiencing from their perspective (Hart & Nolan, 1999).

In a review of environmental education literature incorporating this new research, Hart & Nolan (1999) chose 40 exemplar journal articles and dissertations that used these varied methods and perspectives. Many of the articles were still within the quantitative, positivist tradition. In almost every case, the studies using quantitative methods found positive changes in learner's knowledge, attitude or behavior after an environmental education experience. Ironically, the authors conclude that "This sounds like common sense-putting people though an environmental education experiences increases awareness" (Hart & Nolan, 1999, p. 7). However, in this review, the authors discount the two quantitative articles, which did not see positive changes, as being too short to create change, contradicting an earlier statement that the length of programs did not affect results. This contradiction arises from the lack of understanding of why learning did not occur, a question usually not answered by the quantitative methods that were used.

This "common sense" argument also speaks to the paradigm in which learning research in environmental education has been embedded. Environmental education research has viewed students as passive recipients of knowledge that can be altered by an environmental education experience—and not as active agents engaged in sense-making and knowledge construction (Rickinson, 2001; Stevenson & Dillon, 2010). In an extensive review of over 100 articles on

learning in environmental education from the 1990's, Rickinson (2001) found "evidence to suggest that environmental education initiatives can affect changes in learners knowledge or attitudes" (Rickinson, 2001, p. 268). The majority of research reviewed was quantitative in nature and often in the form of surveys or pre and post experience tests. This homogeneity in method allowed for information about the learners, but little understanding of the learning process. As Rickinson (2001) explained, there is evidence of learning happening, but the uniformity in methodology allows for little understanding of how or why.

Because a preponderance of environmental education studies were designed to see if change had occurred, and not why, when some studies showed lack of knowledge increase after an environmental education experience this would lead to speculation versus empirical explanations as to the cause. This highlights the need for methods to understand the learning process and not just shifts in measured educational outcomes.

And yet, the 'if you teach it they will learn' model continues within contemporary environmental education. Brody (2005) states there are environmental educators who simply believe that learning is a "logical outcome" of an environmental education experience. He argues that the empirical evidence to date shows that environmental education experiences in natural settings do not spontaneously allow for learning. Thus he provides a theory of learning in nature, influenced by informal learning theory, which states "meaningful learning is a result of direct experience(s) over time in which personal and social knowledge and value systems are created through complex cognitive and affective processes" (Brody, 2005, p. 610).

Brody's theory of learning aligns more closely to current learning and education theory. It is believed within these disciplines that students are active participants in their learning and they bring ideas, beliefs, cultures, and understanding into any learning situation, which will

affect what they gain from the experience (Bang, Medin, & Atran, 2007; Bell, Lewenstein, Shouse, & Feder, 2009; Gutierrez & Rogoff, 2003; Bransford, Brown & Cocking, 1999).

Evidence suggests that many environmental education experiences do allow for learning or awareness to occur (Rickinson, 2001). However, it is important to make visible an assumption that many environmental education practitioners still have, one unfortunately that has been around since the beginning of environmental education; that learning is a passive process, similar for all participants and a natural outcome of an environmental education experience. Assuming all people will gain from an environmental education experience prevents practitioners from understanding what different students gain from the experience and what aspects of the program facilitate those gains.

Grades and Standardized Test

Another way in which studies have shown how environmental education experiences affect knowledge gain, is through grades and test scores. Science has often been the discipline used to teach about the environment and for many studies the knowledge being tested has been scientific understanding. However, data have shown that environmental education can positively affect many different subjects (Lieberman & Hoody, 1998; Wheeler, Thumlert, Glaser, Schoellhamer, & Bartosh, 2007).

Lierberman and Hoody's (1998) study looked at 40 schools that used the environment as an organizing principle for teaching. They found students in 92% of the environmentally focused schools had better test scores and grades in art, math, science, social studies, and creative thinking and communications skills than those schools which did not focus their curriculum around the environment.

An evaluation on the effect environmental education on learning in K-12 students found in18 of the 20 studies reviewed positive correlations between environmental education participation and academic achievement. There was evidence of improvement of math and science skills and partial evidence of increased achievement in social studies. The studies consisted of comparison of standardized test scores of schools or students who participated in environmental programs versus those who did not (Wheeler, et al., 2007).

These studies show positive outcomes from environmental education within multiple disciplines. However as Wheeler et al. describe "studies focus on identifying and measuring changes in students' performance and behavior, and do not identify the specific factors that cause these observed effects" (p.36). The authors assert that is where future research should focus.

Within environmental education there is generally the belief that the knowledge gain described above would serve as the springboard for creating environmentally friendly citizens. The next section will discuss what research has shown about the correlation between knowledge and environmental stewardship behavior.

Relation between Knowledge and Behavior

Within early environmental education literature a model has existed that knowledge would directly increase an individual's concern about the natural world, which would then change the individual's behavior to be more pro-environmental. However, research has made visible the complexities behind behavior change. Hungerford & Volk (1990) described an earlier meta-analysis of environmental education research, which showed there is not a direct correlative relationship between knowledge, attitude, and behavior. Instead they created a more complex model of why people do or do not act in an environmentally friendly manor, which took

into account personal and situational factors. The authors called for environmental education to change instructional focus beyond knowledge dissemination about ecology or the environment and instead focus on environmental issues and the opportunity to "develop ownership and empowerment" (Hungerford & Volk, 1990, p. 17).

A couple of decades later, many theoretical frameworks had been developed to explain the gap between having environmental knowledge and awareness and the lack of environmentally responsible behavior (Kollmuss & Agyeman, 2002). In an attempt to synthesize a single model from the multidisciplinary models and empirical studies, Kollmuss & Agyeman (2002) created a model that incorporated internal and external factors and barriers. Knowledge is only one part of the equation, and they argue, some is necessary for awareness and concern, but more knowledge does not necessarily lead to more pro-environmental behavior. Explaining human behavior is not simple, and one model likely cannot incorporate all variables. But what is important with this model is the acknowledgement of the individuals personal, social, cultural, economic, and political realities are playing a part in pro-environmental behavior.

Twenty years after the Hungerford and Volk article critiqued the linear knowledge-attitude-behavior model and argued for its disuse, Heimlich (2010) argues the same model is still at the center of much environmental education research. Heimlich (2010) posits this is why environmental education is not reaching its goal of behavior change or creating a more sustainable citizenry. By acknowledging the complexity behind behavior change, environmental education would have a better chance of reaching its end goal of a more environmentally friendly citizenry.

Exposure to Nature

Not unlike the assumption that all environmental education experiences will lead to learning, there is an implicit belief within environmental education that if you put humans in natural settings they will enjoy, learn from, and bond to it and ultimately want to protect it. Research has shown that there are no differences in connection or comfort with nature by race, ethnicity, or socioeconomic status (SES) with early and frequent exposure to green space (Strife & Downey, 2009). However, because of increased urbanization youth have decreased access to natural spaces and there is disparity in access by race and socioeconomic status (SES) (Castonguay & Jutras, 2009; Strife & Downey, 2009). Studies have shown that natural spaces and wildlife have different meaning depending on neighborhood characteristics, prior experience, and the youth's social and environmental context. Residential environmental education programs attempt to overcome the decreased access to green space by allowing for an immersive experience in nature. However, evidence suggests that exposure to nature within residential environmental education programs does not always create a positive feeling or connection to the natural world.

Experiencing Nature at Home

How do youth experience nature in everyday life? Prior studies have shown that semi-natural locations in urban and sub-urban environments can be among the most liked and disliked places for youth. In a study of liked and disliked play locations in a poor neighborhood, researchers gave twenty-eight children ages 7-12, cameras to take pictures of their favorite places. The children were then interviewed about their pictures. The places the children liked the

most were also those disliked the most, which were parks and playgrounds. The youth liked the space for the opportunity for unstructured play at the playgrounds and the presense of vegetation. The reason for dislike of the same places were mainly attributed to feeling unsafe and perceived physical or social danger, which included a fear of being beat up, and encountering broken glass or syringes (Castonguay & Jutras, 2009).

In an effort to understand how childhood play expereinces in wild places affects later environmental concern, Bixler, Floyd and Hammitt (2002) surveyed nearly 1800 middle school students in two separate studies. From these data the researchers created three catagories depending on where and how frequently the youth played , Wildland Adventurers (WA), Urban Adventurers (UA), and Yard Adventurers (YA). The WA had high play scores in all environments, UA had a high scores for urban setting and moderate for wildlands, while YA only had high scores for the yard. The results showed that WA had the lowest fear expectancy of wildlands and desire for modern comforts, followed by UA and YA (Bixler, Floyd, & Hammitt, 2002). The findings do not provide "even indirect support for the relatioship between childhood play and mainstream environmentalism" (Bixler, et al., 2002, p. 814), but it did show variance in desire and comfort in natural spaces based on prior exposure.

Few studies have tried to understand how the urban ethnic minorities experience wild places or wildlife. A qualitative study by Van Velsor and Nilon (2006) attempted to fill this gap, and researched how urban African-American and Latino adolescents experience wildlife via interviews and grounded theory. The authors found conditions necessary for connection to wildlife included positive adult messages about wildlife, access to and time in urban green spaces, and participation in variety of positive wildlife activities. These data made visible "the importance of social and environmenal context with respect to a person's experience with

wildlife" and the authors suggest "that it is not so much the type of activity that is important as it is the nature (safe, positive, and exciting) and frequency of the encounters" (Van Velsor & Nilon, 2006, p. 368).

Thus, evidence suggest that comfort or connection to wildlands or wildlife may not occur automatically for youth with a lack of exposure. However, these studies also suggest that if youth feel safe, get to spend time in green spaces and natural settings, and have positive adult messages, this can lead to a desire and a comfort being in wildlands or around wildlife.

Visiting Nature via Residential Environmental Education

One of the strategies used to immerse students into nature has been through residential environmental education programs. Residential environmental education programs are programs in which students stay overnight for one to several days in a park or semi-natural areas usually devoid of urban amenities. The setting is used to teach about a variety of subjects but there is often a science focus. These venues serve as unique and possibly first-time experiences in a natural setting for many students and are places to interact with nature and engage in experiential learning.

But what do students get from some residential programs? Several studies on residential environmental education programs have shown that students have an increased connection to nature in the form of comfort and stewardship after the experience (Kearney, 2009; Stern, Powell, & Ardoin, 2008) . Other research found attitude changes about human dominance and wildlife for those who attended a residential program (Bogner, 2002; Dettmann-Easler & Pease, 1999) while still others have found decreased connection and an elicitation of fear after a

residential program (Eagles & Demare, 1999; J. J. James & Bixler, 2008; Smith-Sebasto & Cavern, 2009; Smith-Sebasto & Walker, 2005) .

Kearney (2009) reported on the student outcomes after attending a residential program, using pre and post visit surveys. The author found a significant increase in students' comfort and interest in nature, and sense of stewardship, especially those with low connection before the visit. This shows promise in terms of demonstrating how such experiences can positively influence student perceptions and commitments about nature.

Stern et al. (2008) also collected data via pre and post experience surveys created to determine if the goals of another residential camp, the Great Smoky Mountains Institute in Tennessee, were being met. He found significant positive increase immediately after an experience in stewardship, awareness, connection to nature, and interest in learning. After three months time, only stewardship and awareness results remained significantly different from pretest, highlighting perhaps the need for ongoing forms of engagement and learning.

Bogner (2002) analyzed pre and post program surveys for a four-day residential environmental education experience for youth 11 to 16. Data showed significant changes in attitudes about human dominance over nature and altering nature but no change in conservation attitudes. The author had found significant change in conservation attitudes in previous studies, thus he conjectures the lack of change in conservation attitudes in this study was due to the curriculum not emphasizing conservation.

A study of six different residential environmental education programs throughout the Midwest with 1 to 5-day stays collected data via surveys pre, immediately post, and three months after the experience and compared the results to control classes that did not experience the residential environmental education program but had classroom environmental education lessons

(Dettmann-Easler & Pease, 1999). The survey asked questions dealing with attitudes toward wildlife and found significant difference in pre and post-test for the experiment group in ten of eleven factors, while the control group had significant change on five factors. The delayed post-test showed significant changes remained in eight out of the original ten factors. The residential environmental education experience seemed to change attitudes about wildlife more so then the classroom environmental education experience.

However other studies have shown mixed or even contrary results to those above. For example, Smith-Sebasto and Cavern (2009) used the Children's Environmental Response Inventory (CERI) survey pre and post visit to determine student's perceptions on Environmental Adaptation (respect), Environmental Trust (comfort), and Pastoralism (affinity). The focus of the study was to elucidate the effect of pre and post-meetings bracketing a residential environmental education experience at the New Jersey School of Conservation. The authors found only a significant increase in Environmental Adaptation (respect) for students who experience a pre and post event follow-up meetings. For all groups Pastorialism scores (affinity) decreased, but not significantly. The authors theorized that the decrease in affinity was due to "naïve" concepts about being in nature and not having proper dress.

In qualitative analysis of environmental educational experiences, students' safety concerns have also been noted. Smith-Sebasto and Walker (2005) asked 2779 student participants what was most meaningful, most confusing, and what they would like to learn more about after attending New Jersey School of Conservation program. From the results 5 main categories emerged: Safety, recreational-physical activities, scientific, social, and trip defined as phenomena related to the purpose of the program. Safety was by far the most mentioned when asked about the most meaningful aspect of experience even though it was only twelve percent of

curriculum. Next most meaningful was social, followed by scientific, and then recreational. The authors noted that making students feel safe could help maximize the learning.

Eagles and Denmare (1999) found no statistical significant changes in pre or post-survey results in ecological or moral attitudes of 6th graders after attending a weeklong residential environmental education experience. The authors postulated the lack of significant change was due to students entering the residential environmental education experience with moderately high moral and ecological attitudes. The authors also noted a previous study of the same curriculum which did not find change in students ecological or moral attitudes, and thus implicated the curriculum as part of the ineffectualness (Eagles & Demare, 1999).

An ethnographic study of 20 "gifted" 4th and 5th graders tried to describe the "children's lived experiences" during a 3-day residential environmental educational program (J. J. James & Bixler, 2008). From their domain analysis several themes emerged: the importance of unstructured interaction, social interactions, and perception of choice. The authors noted that concerns for personal welfare showed up in student's journals and letters to the next class and informal discussions with each other.

Thus, findings regarding the effect of exposure to natural spaces via the immersive experience of residential environmental education programs and increased connection to nature have been mixed. Some programs saw increased comfort and desire for stewardship while others saw decreased connection or fear of the natural world. These results helps dispel the belief that that exposure to the natural world is experienced the same for all individuals and will automatically lead to changes in attitudes, beliefs, and connection to the natural world.

Environmental Education and Non-Dominant Populations

Early research on racial diversity and environmental education in the 1970's and 80's focused on underrepresentation of people of color using natural areas or national parks. The theories that arose were the Marginality Theory, which ascribes the difference in participation rates due to "historical and ongoing discrimination" and the Ethnicity Theory which explains difference in participation as a reflection of different values and norms (James, 2003). This early research attempted to explain the difference in participation rates but did little to change it.

Lewis and James (1995) called for an increase of inclusion of diverse voices into the environmental education agenda, which historically has been dominated by members of the White, middle-class. The authors argued that there are multiple misconceptions in environmental education, including a belief in a universal appeal of environmental education programs and subject matter. They recommend tailoring programs to meet the needs and interests of the audience and expanding the focus of environmental education beyond environmental issues, to include social and political issues.

This lack of inclusion of diverse voices has non-dominant people from environmental education who are most affected by environmental degradation and least likely to experience the benefits of exposure to the natural world (Grass & Agyeman, 2002; Strife & Downey, 2009). A compelling argument has been made that the "lack of relevant and culturally inherent environmental education resources to low income children, and schools serving children of color" makes this a social justice issue (Grass & Agyeman, 2002, p. 2).

Another way environmental education has been limiting has been its narrow focus on preserving natural areas at the exclusion of issues of environmental justice (Grass & Agyeman, 2002). Environmental justice brings with it social and economic issues and is the auspices under which many diverse voices have fought for humans and the environment. Environmental

education's limited focus on environmental protection and preserving spaces least affected by human actions, served to exclude populations most effected by negative environmental conditions in urban settings (Grass & Agyeman, 2002; Strife & Downey, 2009).

Incorporating Culture and Lived Realities in Environmental Education

The incorporation or recognition of the students' culture and lived realities has the potential to make environmental education experiences more relevant and empowering for all students, especially those from non-dominant populations. A recent study found that students environmental education experience differs depending on students lived experiences and encountered narratives. In an ethnographic study of two student groups with an environmental focus, it was found that “the prevailing narratives of oppression and privilege permeate environmental education” (Tzou, Scalone, & Bell, 2010, p. 117). The exclusion of non-dominant students lived realities helped perpetuate their direct and indirect oppression within the environmental education experience. The authors argue, youth need to be able to question the “culture of power” and take action based on their focus and desires (Tzou, et al., 2010).

Culture also determines how we interact with the natural world. In a study of how individuals from two rural populations and an urban population understood and interacted with nature, Bang et al. (2007) found a difference between the rural Menominee children, rural European American children, and urban children. The study found that the ecological reasoning was common even among the youngest Menominee children, but not found in rural European Americans or urban children. That meant the Menominee children saw humans and themselves as part of the ecological structure, versus the other children who saw humans above ecology and more than animals. The authors note, "both culture and experience affect children's anthropocentrism and propensity for ecological reasoning" (p. 13869).

Kahn (1999) conducted a study to understand what urban youth thought about and valued in the natural world. He also explored in this study what environmental issues youth were aware of, discussed and acted upon. Kahn interviewed children in 1st, 3rd, and 5th grades and found that the youth knew about air and water pollution and litter. However the children were less likely to believe that such issues affected their city. He explained this was because of "generational environmental amnesia", a human propensity to assume the properties of the environment we are surrounded by are 'natural' and simply how things should be. He argued that urban children will assume the environmental degradation they know is natural. Thus the lived reality of the urban environment becomes their measure of nature and natural (Kahn, 1999).

Research has shown that environmental education can be a place of empowerment if used as a venue to give students voice and to facilitate action, especially within their community. Sadeh (2006) conducted a study which created a curriculum within a science classroom of low-SES, African Americans and Latino's utilized the students' "personal and cultural knowledge" and tied the curriculum to environmental and community issues. Findings from this study showed that students brought knowledge to science class, translated it into their own language, and became empowered and more educated about local environmental issues (Sadeh, 2006).

The assumptions within mainstream environmental education discussed previously include a belief that all environmental education experiences would lead to learning, be experienced similarly by different students, and that knowledge would lead to behavior change. These assumptions have prevented environmental education from evolving to be more inclusive because they have at their foundation the beliefs of a homogenous population and experience within environmental education (Lewis & James, 1995). These prevailing assumptions have also been buttressed by a history of somewhat uniform research methods. It has been argued that

research methodologies within environmental education may be contributing to keeping out voices beyond those of the dominant culture (Agyeman, 2003; James, 2003). More culturally congruent research methods are called for within environmental education, as the failure to facilitate cultural diversity within the discipline is tantamount to silencing the voices that need to be heard the most (Agyeman, 2003; James, 2003).

The following studies presented in chapters 2 through 4, attempt to fill gaps in the research literature, and address the above concerns by utilizing a research methodology which focuses on individuals experience and context. These studies take into account how individual's background, cultures, and lived realities interact with the context of a residential environmental education program. Many of the participants of this program belong to groups underserved in the past by environmental education, and hopefully these studies serve as a venue for their voices to be heard.

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Chapter 2

How Youth Engage with the Natural World during a Residential Environmental Education Program

Introduction

The understanding that an individual's prior knowledge, experience and context would affect how they experience an environmental education program may seem intuitive. However, as shown in Chapter 1, a tacit assumption of many environmental education programs has been that participants will enjoy, bond to, and ultimately want to protect the natural setting they are exposed to and that learning is a natural outcome (Brody, 2005). Learning scientists and multicultural education theorists argue that the ideas, beliefs, culture, and understandings that student's bring to a learning situation and the learning environment itself affects their learning experience and thus outcomes (Banks, et al., 2007; Gutierrez & Rogoff, 2003). Thus, it is important to understand in this learning context how the process and experiences differs across individuals and cultures. For purposes of this research, I define culture as "shared routines, practices and beliefs" that are passed on through human social interactions. Consistent with previous literature, I also recognize and that people have multiple cultural identities, and there are a diversity of ways of being within all cultural communities (Lee, 2008). This understanding will allow learning environments to be customized for the interests and backgrounds of particular cultural groups.

It is also understood that informal settings for learning science, such as environmental education programs, can be important spaces for individuals from marginalized groups, as it

provides a venue for increasing interest and identity in sciences (Bell, Lewenstein, Shouse, & Feder, 2009). To date, no residential environmental education programs have examined how students' learning experiences differ using an ecological framework on learning. The purpose of this chapter is to address the following research questions using an ecological framework:

> How do the experiences of students differ during a 5-day residential environmental education program? How do student's prior knowledge and experience with nature affect their connection to the environment?

This research adds to educational discipline and theories by providing a new understanding how individuals experience and engage during a residential environmental educational program.

Environmental Learning from an Ecological Perspective

There is a movement in education research that focuses on learning in informal settings, towards the use of an "ecological framework" on learning. This framework takes into account "cognitive, social and cultural learning processes and outcomes that are shaped by distinctive features of particular settings, learner motivations and backgrounds, and associated learning expectations" (Bell, et al., 2009, p. 31). To date, this comprehensive ecological framework has not been applied to a residential environmental education program.

Most environmental education and residential environmental education research fails also to recognize participants' sociocultural context and how that context affects learning, experience and outcomes. Carol Lee (2008) has argued that "we cannot articulate a generative and robust science of learning and development without explicit attention to the diversity of the human experience" (p. 272). Lee suggests that for too long culture was equated with ethnicity and that there has been an assumption of homogeneity within cultural communities. Culture instead

should be seen as “shared routines, practices and beliefs” that are passed on and that people have multiple cultural identities. There are, in other words, a diversity of ways of being within all cultural communities (Gutierrez & Rogoff, 2003; Lee, 2008) . Lee (2008) calls for learning theories which acknowledge the complexity of culture and recognize that learning goes beyond cognitive acquisition and includes social and emotional dimensions and identity formations. This study uses Lee’s definition to operationalize culture, while acknowledging every individual has multiple cultural identities.

Theoretical Framework

The theoretical framework for this study draws upon previous theory and research that focuses on the diversity of students’ learning experiences and how diverse learning experiences relate to student's backgrounds and motivations. Students’ prior experience and knowledge of the natural world enhances their likelihood for environmental connection (R. D. Bixler, Floyd, & Hammitt, 2002; Kollmuss & Agyeman, 2002; Strife & Downey, 2009). Environmental connection in this study is defined as a desire to engage in and steward the natural environment. Knowledge and experience are also considered important predictors of learning in informal settings and influential on identity formation (Bell, et al., 2009; J. Falk & Storksdieck, 2005). While this chapter focuses on the diversity of students’ learning experiences, chapters 3 and 4 will focus on changes in identity, interest, and stewardship after the residential environmental education experience (chapter 3), and the interactions of participants’ culture and lived realties with their program experience (chapter 4).

Within environmental education literature and practice, there has been the lack of inclusiveness of marginalized populations (Lewis & James, 1995). Therefore, critical theory

informs the theoretical framework of this study. Critical theory within education is focused on social inequities that are reflected and reproduced within educational institutions (Guba & Lincoln, 1994). The critical theory view of environmental education highlights practices and assumptions based on White, middle class values (Grass & Agyeman, 2002), pedagogy focused on transmission of knowledge, and an assumption that all students will experience programs the same way (Stevenson & Dillon, 2010).

Additionally, historically environmental education has overwhelmingly used quantitative methods to determine if learning outcomes or changes have occurred. As seen in meta-analysis of environmental education research, most studies were designed in the positivist tradition, and often demonstrated learning or changes occurred. The study designs, however, did not allow for an understanding how or why learning happened (Hart & Nolan, 1999; Rickinson, 2001).

These historical characteristics of environmental education have prevented the incorporation of voices from non-dominant populations into the discipline. This is largely due to the lack of consideration how race, class, and gender play a part in environmental issues. It has also denied non-dominant voices , by ignoring the contexts from which learners come and by narrowly focusing on preservation of natural places and not on environmental justice issues (Grass & Agyeman, 2002; Lewis & James, 1995).

Scholars have incriminated the behaviorist, objectivist focus of environmental education pedagogy and research as contributing to the lack of success of environmental education in attaining outcomes, goals, and incorporating diverse voices (Agyeman, 2003; K. James, 2003; Stevenson & Dillon, 2010). According to these scholars, to achieve education equity within environmental education, pedagogy and research must change. Some of the changes necessary are the expansion of the definition of learning to go beyond just cognitive understanding and to

include interest, engagement, and identity with the environment and the recognition of the social and cultural dimensions of learning (Aguilar, Waliczek, & Zajicek, 2008; Banks, et al., 2007; Bell, et al., 2009; Lee, 2008).

Table 1.

Interaction of Critical Theory Framework and Ecological Learning Framework with Research Methodology and Methods

	Critical Theory	Ecological Framework of Learning	Research Methodology	Research Methods
Definition	Critique of social inequities reproduced within education	Learners previous experience and knowledge interact with setting to create cognitive, social, and cultural outcomes		
Environmental Education	Critique of lack of inclusiveness of EE. Lack of inclusion of environmental justice issues. Homogeneity of methodology.	Oversimplification of learning as cognitive; Lack of recognition of the socio-cultural factors in learning		
How Frameworks Informs this Research	Critical Design Ethnography- research to understand and improve experience of youth from non-	Understanding how what students bring to an REE experience affects what they get from it; Examining strands of learning=identity and	Theory-informed Educational Design, Ethnography and Qualitative Research	Participant Observation, Artifact Review, Voluntary Video Diaries, and Semi-structured interviews

	dominant cultures	interest		

Research Design: Methods, Data and Analysis

This case study involved evaluating learning experiences and outcomes of students who engaged in this unique residential environmental education program. Data were collected over 2 years of participation in this program. A variety of ethnographic, qualitative research techniques were used including; participant observation, volunteer video diaries, data mining of student artifacts, and post experience semi-structured interviews (Table 1).

The Residential National Park Program:

This five-day and four-night Residential Environmental Education (REE) program occurred in Yellowstone National Park located in a different state from where the participants lived. All of the participants attended a regional community youth organization situated in a medium sized city in the Pacific Northwest. The community youth organization clubs are also located outside of the city and extend into the suburbs and more rural, residential settings. Annually, twenty-one children were chosen by staff members of the organization to be flown to Yellowstone National Park and attend the program. Four field trips that occurred prior to the REE experience; these focused on: showing the participants how to observe animals safely; team building; hiking and plant observation. The field trips also served as a time for the families, chaperones, and instructors to meet, get an overview of the program, answer questions and alleviate fears.

The program is a partnership created by donors who sought to provide a residential environmental education experience for youth not likely to visit Yellowstone National Park. The program was on its fifth year during the last year of this study. Other stakeholders, besides the community youth organization, includes a non-profit organization which provides the curriculum, transportation and accommodations at the park. The National Park staff provided the culminating experience of the youth earning and receiving their junior ranger badge. The involvement and interest of the National Park staff in the program increased over the two-year study. The multiple stakeholders involved have different, yet overlapping goals for the participants. Below is a table of goals which different stakeholders have discussed with me, but may not include all of the stakeholder goals.

Table 2

The Goals of Stakeholders of the Residential National Park Program

Stakeholders	**Education**	**Personal Development**	**Stewardship**	**Change in Identity**
Donors	Providing educational immersion in this National Park	Providing inspirational immersion in Yellowstone National Park leading to personal empowerment	Environmental awareness and encouragement of stewardship	Allowing for a "life-changing" event
Community Youth Organization		Provide an opportunity for positive youth development		
Curriculum providers affiliated with National Park	Increase knowledge of park ecology, geology, and natural history		Create desire and ability to defend the existence of the National Park	
National Park			Creating future environmental leaders	Creating connection of underserved youth to

				National Park system
Researcher	Understand how REE experience can engage students from underserved populations in science, the natural world, and education	Understand if experience affects how youth feel connected to natural world	Understand if experience affects youth's desire to protect natural world	Understand if experience leads to interest or identity changes

Chaperones consisted of five staff from the community youth organization and myself. One staff person was in charge of organizing the logistics, while the others helped with pre-field trips and supervising the youth during the trip. In the first year of this study a new staff person took charge of the program right before the residential environmental education experience. There was also a change over in chaperones each year.

The resident experts from the non-profit organization affiliated with the park, provided the curriculum during the program. The curricular focus of the program was on the geology, ecology, and natural history of the park. The specific focus of each lesson depended upon the instructor's passion and knowledge. At the core of the curriculum is a description of the history and present condition of the biotic and abiotic surroundings.

Each participant was given a digital camera when they arrived and was tasked with using one of the pictures at the end of the trip to argue why the park should be protected. Protection of place was the central theme while showing the participants the wonders and wildlife that inhabited in the park.

Evolution of Researcher Positionality:

My position as participant observer evolved overtime. Originally the chaperones and I believed I would sporadically help out when needed, but I would spend a majority of my time quietly observing the participants and taking notes. However, during the first year, I took on more of a chaperone role out of organizational necessity and a desire to help and to be seen as an asset not a burden. Also, because I was several years older than the other chaperones, most youth and some parents assumed supervision was part of my role. By the second year, there was one less female staff, who was responsible for cooking, thus each chaperone had increased food-related duties and additional responsibilities, including myself. During the second year I also led one of the pre-trips, which previously involved hiking in a local park. I evolved it into a treasure hunt for local plants in the same park.

Participants and Setting:

The participants chosen to attend this program were usually 11 years old and entering 6th grade in the upcoming academic year. For most, it was their transition summer into middle school, for others they had another year until junior high. The participants were from diverse ethnic and socio-economic backgrounds. One of the selection criteria for participation was that the children chosen who would likely never visit Yellowstone National Park without this program.

During both years of this study, last minute substitutions of participants were required. Two were due to participants getting in trouble with the community youth organization and thus

a revoking of their option to go. A third was due to a family custody dispute. Another participant's legal guardian passed away a week before the trip, thus temporary custody had to be determined in order for her to go on the trip. These last minute changes speak to the complexity of the participant's lives.

Yellowstone National Park consists of several thousand square-miles of mostly undeveloped land in a mountainous region. Thus it serves, like all National Parks, as a vestige of land minimally impacted by human development. This allows for habitat for several large mammals that need large undisturbed spaces and are not found in many other places in this country. The park is at an altitude several thousand feet above where the youth participants live, which required some acclimation. The parks unique fauna and geology attracts visitors from all over the world.

The first summer, participants stayed in rustic cabins in groups of 2-4 in a remote area of the park. The restrooms were located in another building and bison were known to roam through the cabin area. Exterior lights did not exist, thus the participants had to use flashlights to walk from their cabins to the bathrooms, and often took pleasure in scaring each other by saying that they saw bear or a bison while they journeyed to the restroom. The people in charge of the cabins were not used to having a large group of children in that space. There were many rules, and the children were oriented to them the first day.

In the second year of this study the participants stayed in houses right outside the park and near a town. This mitigated the participant's fear of the dark and wandering bison. Proximity to town allowed the group to purchase supplies and provided security in case there was a medical emergency. The houses were large and accommodating, and there was one house

for the male participants, one for the female participants, and a third for chaperones. Each night one of the chaperones stayed in each of the houses where participants stayed.

Research Findings

The entirety of data collected, including participant observations, artifact review, and interviews were processed to understand how youth experienced the residential program. Data consisted of approximately 150 hours of participant-observation which includes pre-trip events and the 5-day residential program over two years. Artifacts were also collected which included thank you cards, photos taken by participants and voluntary video journals the participant at Yellowstone. Seven participants from each year's cohort were interviewed 9-19 months after the residential program. Video journals and interviews were all transcribed and thank you cards and pictures were reviewed and categorized.

Participant observation notes and the transcribed journals and interviews were all coded and recoded as an iterative process. The coded work was distilled into themes or constructs via rereading data and looking for recurring concepts or ideas, and finding within the data support for the themes (DeWalt & DeWalt, 2002). As themes developed, new data were compared to those themes. Analytical memos were created from the coded material describing how patterns fit together, while continuing to look within the data for inconsistencies (Merriam, 1998). This process allowed for a refining of categories or themes into key concepts and integration or development of less developed constructs, eventually creating a relational understanding of constructs to each other and students residential environmental education experience (Fetterman, 2010). A “constant validity check” occurred during analysis which involved looking for consistencies among students, checking between what was observed and what students said,

examining evidence that does not support conclusions, and developing alternative explanations (DeWalt & DeWalt, 2002). To facilitate the identification of patterns and the creation of themes database software, NVivo, was used for data management and analysis. The software was used for coding, retrieving, reviewing, and managing data (Fetterman, 2010).

What emerged were three distinct types of experiences or types of engagement. I describe the experience of two participants in each group for readers to understand the boundaries of the groupings and how they differ. The amount of data available about each individual varied depending on several factors. These include how much time we spent on the same bus together; whether participants were more outgoing or willing to share their ideas with me; and whether they chose to participate in the video journals or post experience semi-structured interview. Below is a list of each participant with demographic characteristics and what data was available to describe their experience (Table 3).

Educational researchers have studied how students interact with subject matter, their peers, and classroom objects designed to facilitate learning, such as labs, demonstrations, and living organisms. There is recognition among educational researchers that students' interactions and experiences within traditional classroom settings will affect aspects of their learning. In informal settings, a Contextual Model of Learning posits that there is a "never-ending dialogue between the individual and his or her physical and sociocultural environment" (J. H. Falk & Dierking, 2000). Thus researchers have tried to discern how individuals interactions with and within the context of informal settings affects aspects of learning (Bell, et al., 2009; J. Falk & Storksdieck, 2005; John H. Falk, Heimlich, & Bronnenkant, 2008). Yet, until now, there has not been an empirical evaluation of participants' experiences within the unique learning environment created during a Residential Environmental Education program. Within a residential program

the classroom, the curriculum and objects for demonstration are provided by the natural surroundings. Below are the findings on how participants of this REE program interacted with the natural world and with each other.

Three distinct patterns of interactions emerged within the data: (a) those who engaged with nature, (b) those who visited and viewed nature, and (c) those who engaged with other participants. The first group was the smallest group, which was those who engaged with the natural world. Over the two years this study was conducted, only a few students stood out as being consistently and primarily engaged with the natural world during their experience. Most participants fell into the second group, those who were engaged with the uniqueness of the park and were there to see and "visit" nature. A third group consisted of youth primarily focused on social interactions with other program participants. Finally, some participants' experiences are neither categorized nor included in this chapter due to insufficient data.

In the following sections the experiences of two individuals who exemplify each group are described with vignettes and their own words (see Table 3 for an overview). The individuals used as examples to differentiate the groups were chosen because there were several data sources in which to triangulate. There was not an a priori determination of an individual to focus on for a case study. Instead the individual exemplars that were used clearly fit within the parameters defining the groups.

To understand if prior knowledge and experience influenced how individuals were interacting with the natural world, as found in previous literature, I describe what was known of the exemplars prior knowledge and experiences. My understanding of participants' prior knowledge and experience varied, as previously noted, depending on what was shared during the program or if they participated in the post-experience interview where questions focused on

those variables. Differences existed between groups and are described below. Patterns of interactions found among the program participants are as follows:

Engaging-Participants focused energy in understanding and seeing and experiencing the natural world. They made connections to prior experiences and understandings. They came with prior knowledge and experience, interest or identity in the natural world.

Viewing/Visiting-Participants observed their surroundings, but the natural world was an item to view versus something connected to prior interests or identity. Prior knowledge varied considerably, but experience tended to be low. Situational interests in natural world was sometimes created.

Socializing-Participants noticed surroundings but the natural world served as a setting for socializing with friends. They came with strong social identity or interest.

Table 3

Participants Demographic Characteristics and Data Sources Used to Describe Experiences

Group and Participant	**Demographics**	**Data Sources**
ENGAGING		
Kai	Caucasian Male	Participant Observation, Artifact Review, Video Journal
Adam	African American Male	Participant Observation, Artifact Review, Video Journal, Post-experience interview
VISITING/VIEWING		
Adela	African American Female	Participant Observation, Artifact Review, Post-experience interview
Marco	Caucasian Male	Participant Observation, Artifact Review, Video Journal, Post-experience interview

SOCIALIZING		
Ursula	African American Female	Participant Observation, Artifact Review, Video Journal, Post-experience interview
Tammy	Caucasian Female	Participant Observation, Artifact Review, Video Journal, Post-experience interview

Engaging in the Natural World: "It's Just Amazing"

Consistent with previous research, data analyses indicate that the participants most engaged with the natural surroundings of the park were those who arrived at the program with significant prior knowledge and experience with the natural world. These participants' interest and identities were tied to the natural world and learning. Prior studies have shown similarly that youths' perceptions and connections to natural spaces and wildlife is influenced by prior experience (R. D. Bixler, et al., 2002) and their social and environmental context (Castonguay & Jutras, 2009; Van Velsor & Nilon, 2006).

Kai's experience: In awe of the park

Kai, a Caucasian male, attended the community youth organization club in a smaller suburban community. He was a quiet participant; he did not seek group attention but would often engage one on one with staff and other students. He came to the program with experience being in semi-pristine environments, as he compared the landscape of the park to the "open skies" he had seen on previous family hunting trips. He also brought knowledge about the natural world and answered naturalist questions asked by the staff. He would also share what he knew with

others, including myself. Kai stood out during my participant observation, as never complaining about hiking, bugs, or being in natural places and was often expressing his wonder towards the landscape and his excitement about being there. He appeared genuinely fascinated and enamored with being in and learning more about the park. Kai was unique in that he came to the residential program with a strong prior interest in Yellowstone. In his thank you card to the donors he wrote "It has been my dream to come here since 3rd grade". Kai also had a connection to science as his future career was to be a marine biologist or musician.

According to the Hidi and Renninger (2006) model of interest development, student's initial level of interest has a profound effect on learning, attention, and goal setting. The authors define a four phase model of interest, which includes: triggered situational interest stimulated by external context; maintained situational interest which is sustained by the individual; emerging individual interest in which the individual seeks repeated engagement; and well-developed individual interest where the individual re-engages over time (Hidi & Renninger, 2006). Kai arrived at the residential program with a well-developed individual interest in the park. The context of the residential program allowed him to reinforce his positive feelings and gain more knowledge and connection to place.

Interest and wonderment of the park

Hidi and Harackiewicz (2000) argued that students with a prior interest in a subject will demonstrate more attention toward the subject, enjoy interacting with the subject, and learn more than students without the same level of interest. Kai arrived with a high interest level in the park, which led to a sense of wonderment while he interacted and also a desire to learn more about it.

Many other participants were focused on seeing specific animals or features of the park while there, Kai appeared enamored with the big picture, the whole park. During his video journal on the third day of the program, Kai had a hard time picking out a favorite experience from his time in the park, because it all has been "amazing". He settled on the "sights," which for Kai, like many of the participants, referred to the world renowned features of the park. Kai described his favorite experience to date as being ".....when you're on a hill and look down to this valley and it's just beautiful." That morning they had been up early looking for wolves, but did not see any. Instead of focusing on what he did not see he noted instead the beautiful surroundings he experienced.

> Yeah, we went spotting with scopes to look for wolves. We didn't have any luck, but I don't regret it. It was really beautiful. Because we were at the top of this hill and just looking down into this valley.

Other evidence of Kai's love of landscape and place was found in his pictures. Each participant was given a camera and was allowed to take 50 pictures, one of which they would use to argue for preserving the park. Kai chose to take more landscape pictures, without a specific geological or biological feature centered in the picture, then most other participants (11 out of 50 total pictures). The only other thing he had more pictures of was thermal features (12 out of 50) and the next most frequent was animals (9 out of 50).

During his video journal, Kai was asked what he would tell a person who had never been to the park. His answer again showed his amazement of the park, and also how he interacted with the park via multiple senses and through learning.

> If you have a chance to go, just hop at it. Just go. You won't regret it. It's just amazing. The things you see. The stuff you learn. The things you smell— everything. It's just amazing.

Kai also tried to share his interest and excitement by encouraging others to engage and experience nature, as you will read about in this chapter's description of Apollo's experience.

Kai arrived with a strong connection to the park, leading to an experience filled with awe and even a stronger connection to place. For many their motivations to visit a national park is to see certain animals that inhabit the park or features unique to the park. For Kai, the park as a whole was what he found inspiring.

Identity and knowledge gain

During participant observation, Kai's interactions seemed to be motivated by his interest in learning. He was often answering naturalist questions posed by the instructors, and many of our interactions centered around him explaining to me what he learned or knew about the natural world. He socialized with other boys, mainly his roommate, me and other chaperones. He also tried to motivate others to experience the park. In my participant observation notes there is an instance when Kai tries to motivate one of the participants who was not comfortable interacting with the natural world.

> I also found some buffalo hair and Kai some elk hair, which we brought back to the group. The buffalo hair was much softer than I expected, all the kids willingly touched it except Apollo who was coaxed into it by Kai saying he may never have the chance again.

Kai never explained to me his connection to Yellowstone, or why he had wanted to visit since third grade. He had a familial connection with being in the natural world, via hunting trips and a strong interest in understanding the natural world. His knowledge of the natural world appeared to be tied to his identity and possibly related to his desire to be a marine biologist in his future career, which explained to me during the program. Identity is an important motivator for learning and engagement and may explain Kai's drive to learn more and tie what he learned to previous knowledge.

During his video journal, Kai used a large part of the time to record what he had learned about the sites he had seen that day. His video journal was made with his friend, and they were asked to talk about their favorite experiences, what they would tell someone who had not visited the park, and if there was anything else they wanted to talk about. Kai explained what they learned that day, but also described multiple details about the history of where they were staying in the park.

My participant observation field notes show him wanting to share both his excitement over an experience and the knowledge he brought to the program.

> As we were walking back from our hike to a wolves den, Kai walking next to me declares "that was awesome." He shared his reflections on the elk skull we had just encountered and informed me that "moss is a good to start fires and Native people used dung to burn in the grass lands."

He took pride in the knowledge brought to the program and the knowledge gained. He recognized his accomplishment of completing the culminating academic exercise, the Junior Ranger sheets and receiving a Junior Ranger badge. In his thank you card he wrote, "I came here with vast knowledge but came back as a Junior Ranger."

At the end of the trip, he was contemplative and surprised how fast the time had gone. He thought it was "sad it will be awhile until I come back". The instructor said he could come back and work at the park after high school. Kai previously expressed his desire to be a musician and/or a marine biologist when he grew up. However, by the end of the trip he was contemplating a career change and was considering becoming a park ranger instead.

His growing connection to place also led Kai to reflect on how the residential program could help save the park in the future. He shared his thoughts with me during a hike.

> This is good to get people to know about Yellowstone so if in the future people like want to destroy it we can vote against it.

The level of engagement that Kai exhibited in the park was higher than most other participants. His prior knowledge and experience facilitated a level of comfort and curiosity in the natural world that led to an engagement and wonderment level that many environmental educators would hope all participants experience. His identity as knowledgeable about the natural world also appeared to be a motivator to learn and engage. The positive program experience appeared to facilitate a shift in his identity as he contemplated a change in his future career goals to become a park ranger.

Adam's Experience: Engaging with the Small Things

Adam, an African American male, attended one of the community youth organization clubs in the more affluent section of the medium sized city. He was a very curious and observant participant, often paying attention to things that others did not see. Adam interacted mostly with his cabin mates and chaperones, and his lack of interest in socializing was evidenced by his lack of knowledge of most other participants' names by the end of the experience. Adam arrived with a great deal of prior knowledge of animals, mainly self taught as he is a voracious reader and very interested in animals. Adam also could answer many of the questions posed during the trip about the ecology and roles of animals in the system. He had experience being outdoors and had spent a lot of time in his own yard observing animals and had been on family hikes.

One of Adam's identities is as a storyteller, and his future career goal is to be a story board writer. During the residential environmental education program, Adam used a story he created to describe and share his knowledge and experiences. He created a story from a reflection exercise. The exercise involved describing your surroundings with all your senses, which Adam had done not as himself but as a wolf. He mentioned the story during the video

journal, and said he did not want to share it as it was undone. I asked if I could see it when it was done. On the last night, I was busy with logistics and another chaperone pointed out Adam was hanging around to share the story with me. The night before a chaperone had become sick and required a visit to the hospital for medical attention. Adam's story had the chaperone as a wolf pack member who had gone missing after getting sick, but gets better and returns to the pack. Adam was able to express himself with his story, which also may have served to channel any anxiety he had about a "pack member" being sick.

Curious about the small things

Adam seemed to be drawn to the small mammals and insects, things most other participants did not notice unless they invaded their personal space. He came with an interest and knowledge of animals, but the small animals grabbed his interest and attention. On the third day of the program Adam's created a video journal. He did not focus on sights that the park is known for nor the megafauna. Instead, he reflected on the hike they took that day, and how he was worried about it prior to going, but thought it was "pretty fun". He saw a coyote that day which he mentions in passing "I saw a coyote and I saw a whole bunch of other stuff", and spends more time describing a clicking beetle and moth that landed on him and was "tasting him" and the large amount of animal scat he had seen. He also described how he had help learning how to identify a squirrel, and that there was mouse in front of his cabin that he also wanted to identify. His advice to others was, "You should come here". Adam used his video journal to talk about the things that were drawing his attention, the small things, in this case insects and small mammals, and his interactions with them. These interactions did not seem to create a sense of awe, but they did increase his curiosity and desire to interact and understand these small animals more.

The foci of Adam's pictures were also on small things. The subjects he had the most pictures of were small mammals and an insect for a total of 5 out of 24, and the next most frequent picture was of hot springs (4 out of 24). His focus remained on the smaller creatures throughout the program and during the last days of sharing out. When most participants used pictures of mega-fauna and unique geological features to argue for the protection of the park, Adam used a picture of chipmunk, noting "if you love little things and life you should protect this park". Adam used the organisms that grabbed his attention and interest the most, as the reason to preserve the national park.

Interest-driven learning

Using Hidi and Renninger's (2006) four-phases of interest, Adam came to the residential program with a well developed individual interest in animals' natural history, but the experience may have created a situational interest in small mammals. This led him to spending his free time and energy trying to see, photograph, and determine via small mammal identification books what he had discovered.

During free time one evening, Adam asked me the name of the ground squirrels he had seen around the cabins. I was not sure of the species name, so I showed him the mammal identification books in the lodge and how to use them. Using the books, he made an educated guess to what he had seen, and had the identity confirmed by the instructor. The first animal Adam tried to identify were fairly common place around the cabins, and were noticed by many of the other participants. No other students, to my knowledge put in the same effort to determine what they were. It is unclear to me what was behind Adam's interest in identifying the small mammals. Possible reasons range from his desire to create new knowledge, understand his

environment more, or to utilize the identification books/tools he was shown to take on an expert role.

As is indicated by his pictures, Adam did not just try and identify the ubiquitous small mammals, it appears he also spent time actively looking for and photographing other small mammals in order to identify them. This self-directed learning and attention towards animals that were not the focus of the curriculum was unique to Adam. His focus may have been driven by a situational interest in small mammals that was created during the residential program. His identity as being knowledgeable about animals may have also motivated his desire to see and know about these less seen or discussed animals.

Another example of Adam's self directed interactions with the park happened early in the morning on the final day at the park. Adam and another participant proactively took out a spotting scope to see what wildlife existed in the field nearby. They spotted a grizzly bear wondering through the meadow. An instructor had seen the movement with her own eyes and went to get a spotting scope for others to see. She was pleased to find that a scope was already set up and the bear had been spotted by Adam and his colleague.

Adam's interactions with the park were unlike most participants as he was more interested and attracted to the small creatures than the "wonders" of the park. During the residential program that interest became focused on the small mammals of the park, where he put his energies and efforts into identifying and photographing them. The experience also affected Adam's identity which will be discussed more in Chapter 3.

Adam's identity as a story-teller, allowed him to integrate what he was learning about wolves with what he was experiencing with all of his senses. His story also allowed him to negotiate a potentially stressful situation, and share with me his experiences in a format he was

very comfortable with. His identity as a story-teller allowed him to express himself and interact with the park and myself.

Synthesis

Both of these participants arrived at this program with experience being in semi-pristine natural places with family members, and they both came with some knowledge of the park ecology. They both also appeared to have brought to the program relatively well-developed individual interests, Kai in the park itself and Adam in animals. Their knowledge, interests, and practices of interaction with the environment lead to an engagement with the natural world that surrounded them. This increased their knowledge, interest and influenced their identity.

While part of Kai's affinity was tied to prior experience and knowledge of the park, it also appears his identification and interest with science and learning, led to an experience filled with discovery. His perspective was at the large, landscape, systems level with a desire to protect the whole park. Ultimately the experience along with the strong interest he brought to the program, lead to a identity shift, with a desire to become a ranger.

Adams prior experience and knowledge of animals along with his story-telling abilities led him to engage with the park. His focus, unlike Kai's, was at the smaller things he would often see. Adam actively engaged in increasing his knowledge and understanding of the natural world, with investigation of animal identification and discovery. Researchers found in informal learning settings children learned science by focusing on subject matter they became interested in and by building "islands of expertise" (Crowley & Jacobs, 2002). Both Adam and Kai were building expertise, but their foci were at different scales. Adam was learning about the whole park and Kai was focused on the smallest inhabitants.

Visiting/Viewing: "I think it will be fun to look at nature"

For many of the participants the experience centered around seeing and visiting nature and the natural wonders of the park. The individuals in this group engaged when shown the sights or when their attention was directed toward an activity. However, there was little self-directed engagement in the natural settings. The levels of knowledge and experience they brought to the program varied, but in general it was less experience than those in the previous group. Individuals in this group often had moments of physical or emotional discomfort in the residential setting. Researchers acknowledge that learning requires physical and intellectual comfort in a learning setting. Comfort is considered an important component of the interest strand of learning in informal settings (Bell, et al., 2009).

Below is a the description of two participants experiences who engaged with the National Park as visitors/viewers. Both had little previous experience in natural places, but new interests and new levels of interactions with the natural world were created during the residential program.

Adela's Experience: Seeing, Touching and Trying New Things

Adela, an African American female, attended the community youth organization club at the edge of the city, at the intersection with more suburban and rural communities. She was a fairly gregarious participant, interacting with many of the other girls and the staff. When she attended the residential program, most of her outdoor experience had been playing in her yard during the summer when the weather was nice, or having snowball fights with her brother during infrequent snow events. She explained in her post-experience interview, that she was not a fan of science in school and arrived with little knowledge of the area. What she did know of the

National Park she had looked up on the internet in preparation for the trip. She also had little experience being in semi-pristine settings. The title of this section is a quote from a conversation Adela had on the plane trip to the park, explaining to locals that she wanted to see bears and "nature". Nature for Adela seemed to be equated with any space that was outdoors and something to be visited.

During the trip Adela engaged in looking at the animals and other park wonders she was shown. She sometimes asked or answered questions about the ecology of the area. She was not one of the children who was constantly swatting or running from insects, but she found herself in situations where her physical or emotional comfort level was stretched.

Expectations diverge from experience

Adela's expectation was to see nature, not be challenged by it. A normal response for youth, especially if they are not used to the physical challenges the natural world can provide. When Adela experienced physical discomfort being in the natural environment and her expectations were not matching her experience, their were negative feelings about "nature". During one of the longest hikes of the program, on a fairly hot day, Adela and another participant complained about the hike being strenuous. Adela proclaimed as the group hiked up a small hill, “I did not sign up for this”. Because the park is at a much higher altitude then where the youth live, physical activity was more difficult than usual for participants. On our way back to the buses from the hike we walked through a patch of scratchy bushes and Adela declares "I am sick of nature". Adela's physical discomfort was being translated into a dislike of nature. This situation reinforces the necessity of physical and emotional comfort, for aspects of learning, such as increased interest to occur (Bell, et al., 2009).

Prior experiences

Adela lacked experience in semi-pristine environments and navigated the new environment with her prior related experiences. An uncomfortable incident Adela experienced at the park was tied to a previous event. Bees were circling during a break from a hike in the woods. Adela moved away from them quickly and explained her fear of bees to the instructor. “My mom and I were pulling weeds and bees lived in the ground started attacking us”. The instructor explained to her, that the attack was likely because they disrupted the bee's home, not a random attack. Positive adult messaging is one of the necessary elements for urban youth's interaction and connection with wildlife (Van Velsor & Nilon, 2006). However, in a situation where fear exists, logic may not serve to comfort. For many of the participants the insects they found in their personal space would elicit fear. Adults would explain the lack of danger and that we were in the insects’ homes. This did not appear to increase the comfort for participants fearful of insects. Van Velsor & Nilon (2006) found, positive adult messaging must be accompanied by multiple positive experiences with wildlife, for urban youth to have a connection. It appears to also be true for insects that positive messaging alone cannot create a comfort around them, without prior experience.

Individual and situational interest expands her interactions with park

During the trip, Adela appeared to have an individual interest in an animal with which she had past experience. During a trip to the bathroom, Adela spotted a chipmunk in the parking lot and she pointed out the chipmunk to another participant. Her peer responded, "It’s just a chipmunk". Adela countered with “I’ve never seen one before besides Alvin and the Chipmunks,” and followed the chipmunk around to take a picture of it. This animal sighting had

significance because of her prior knowledge and experience with the cartoon chipmunks. In a synthesis of studies on learning in informal settings, it was found that children often use knowledge from media to orient their learning in science rich settings (Bell, et al., 2009). This was true for Adela and also for to her brother. She explained in a post experience interview that the picture of the chipmunk is the one her brother connected to the most, because of his Alvin and the Chipmunk connections.

> And my little brother, he is fascinated. I go over the pictures with him. Because he's never seen actual a real chipmunk other than like Alvin and the Chipmunks. So he likes looking at the picture of the chipmunk and observing it.

According to Hidi's model of interest development, it appear that during the trip Adela's acquired a triggered situational interest in the park and bones (Hidi & Renninger, 2006). This led to an expanded repertoire of interactions and a willingness to try new things. She even pushed her comfort zone by going beyond looking and actually touching an elk skeleton that was found on a hike, noting "this is awesome". That break-through allowed her to touch other bones that were found during hikes. Pictures of those bones were among the most frequent photos she took and were tied with waterfalls (9 out of 50). I believe her pictures of bones were a record of the expansion of how she was willing and able to interact with the natural world. Adela explained in a post experience interview while we were looking at a picture of an elk skull

> Oh, I remember I picked that up— well, at first I was like— when like at home and it's like stuff that you eat off of like bones and stuff I was all scared to touch it. So it was like a big thing for me to be touching this stuff. But after awhile, because we like— like after I touched this, I like started touching like everything else. Like all the bones and stuff that we saw there.

Another way Adela pushed her boundaries, was that she was one of only two female students who wanted to try a new experience, going to the bathroom in the woods. Many girls attending the program had not ever had to go to the bathroom in nature and for many in seemed

scary. The instructor had told them previously that only about 1% of the people who visit the park ever get far enough away from civilization that they have to go to the bathroom in the woods. Adela was with a group that was only a few minutes from an actual toilet, but she and another girl said they wanted to try to go to the bathroom in the woods. Upon their return, they were congratulated for being part of the 1% club. Adela overcame the fear that comes with lack of experience and knowing to try a new experience, one that many other participants were not willing to try. Adela had a triggered situational interest in the park and specifically on animal bones, which expanded how she was willing to engage with the park.

Marco's experience: Learning new Things

Marco, a Caucasian male, attended a community youth organization club in a densely and diversely populated part of the city. He spent most of his time interacting with a few of the male participants from his and other clubs, all played football and spent much of their free time talking about it. Marco is boisterous and gregarious, he was often answering questions and sometimes asking questions. He would engage with things he was shown and work on his Junior Ranger sheets when told to, but could often be distracted by other boys and could be a distracting influence himself. He arrived with little knowledge about animals in the park or the park itself. His experience in natural settings was mainly playing sports in his own yard and spending time on a beach, when he lived near a lake. He was often swatting at insects and was also one of the participants frequently asking how far we were from our next destination.

Comfort and fear

During participant observation, Marco, was often swatting at insects. Like most of the participants, if he could see insects and his personal space was not invaded, he would take pictures of them or find them intriguing. In one instance, he screamed and ran away from a beetle that surprised him on the bus. Just as in the case of Adela and other participants, being told the insects were not dangerous did not provide Marco comfort.

For some of the participants the flight to the park was their first flight. Marco let me know it was his first flight when he landed. The flight to the park is on smaller aircraft and there was some turbulence on landing. In my participant observation notes, I noted two other times where Marco is talking about the plane ride. One is in a discussion with another participant about the "crazy plane driver". By the end of the trip Marco explained that he was scared during the plane ride trip to the park and was not looking forward to the ride home. His first experience was not comfortable and thus did not create a desire for another experience.

When asked in his post experience interview about his least favorite thing, he talked about the flight and how he thought he was going to die. He had been on another flight since the trip to the park, and did not enjoy that experience either. Fear cannot only make an experience negative, but also negatively affect similar future experiences.

Triggered situational interest in learning about the park

Marco describes himself as someone who enjoys school. During the trip, it appeared learning about the park was a triggered situational interest. In his video journal he talks about what he liked seeing a specific thermal feature. He was prompted to talk about things he wants to remember 10 years in the future.

> "I really liked *the hot spring* because it was like a rainbow. And I want to remember like all of the animals and the grizzly bear stuff. And ten years from now I want to remember stuff like the mountains and like trees— and like how the fire destroyed it and stuff."

It appears that Marco did not just want to remember what he saw and experience, but he also wanted to remember what he learned about it.

He used a picture of that specific hot spring to argue for the preservation of the park, saying it was "pretty" and "nice" and without the park it could no longer exist. Marco had more pictures of hot springs 12 of 50 than any other item, the second most popular were pictures of a waterfall with a total of 9.

During the trip, we experienced a 'bear jam', where a grizzly bear in a meadow near a road was stopping traffic. The participants grabbed binoculars and spotting scopes and all where focused on trying to see the bear. A ranger directing traffic and stopped by our group and to tell us about the bear we were watching. The ranger focused on one of Marco's friends and asked him to be sure to keep us all behind the white line. In about 15 minutes many of the participants had lost interest and were talking among themselves and no longer focused on the grizzly. Marco and his friend and one other participants were still engaging the ranger with questions. In this setting, Marco and his friends were engaged in self-directed learning while other participants had moved on to socializing. In some lecture settings or sharing out sessions, Marco had to be reminded to pay attention or look at who is speaking, however in this situation, either the grizzly or the ranger or his friends drew him to continued engagement. On the final afternoon when the whole group was asked what everyone had learned, Marco shared he had learned that "bears don’t eat, poop or pee for 5 months".

Most of what Marco was experiencing in the park was very new to him, and as he described, more than he could have imagined. However, some aspects of the park seemed to create triggered situational interest in different subject matter, bear and the specific hot spring he liked. In his post-experience interview, when asked about his experience Marco said "My

favorite part was *the specific hot spring* thing with the rainbows that we saw when we went up the hill."

Synthesis

For both of these participants, nature was something to observe, touch, and occasionally run from. Neither participant came with a strong interest in science nor much experience in natural settings. Both experienced some level of discomfort during the trip. Adela and Marco did not see themselves as part of the system they were exploring and learning about. Instead the natural world was something to visit and protect yourself from. However, for Adela, her desire to try new things expanded her interests and modes of interacting with the natural world. For Marco, his triggered interests led to some self-directed learning about specific subjects.

Adela's and Marco's lack of experience in wild places can be a part of their fear and lack of comfort in the national park. Researchers surveyed nearly 1800 middle school students about their play expereinces in wild places . They found that youth with the most experince playing in wild places had the lowest fear of semi-natural places, followed by those with alot of experience in urban setting and moderate level of experience in wildlands. Those with only experience in their yards had the highest fear of wild lands (R. D. Bixler, et al., 2002).

Socializing: "It was pretty cool just to meet people"

During participant observation it was apparent that for some of the participants meeting and socializing with new or old friends was their priority. Similar to what James and Bixler (2008) found in their assessment of meaning making of children who attended a 3-day residential

environmental education program "The natural environment was a backdrop, not the focus, for the social relationships".

Learning is a social phenomenon and creating a positive social environment for participants to gain personal and social assets is a goal of the community youth organization that the participants attended. For those participants with a social focus, their interactions with the natural environment was as a setting for socializing or playing on with their peers.

Ursula's Experience: Hanging out with Friends

Ursula, an African American female, attended a community youth organization club in a densely and diversely populated part of the city. She was one of the more social females and her attention was often on other participants more than her surroundings. A good friend from her club also attended the program, and was very gregarious. One of my first observations as we started the journey to the airport was how Ursula and her friend were moving around the room together and socializing with many of the other participants and staff. In order to facilitate Ursula and her friend "seeing" the park, they were put on separate buses during the day, but allowed to be roommates. Ursula also made a new friend on the trip and they became very good friends, Polly.

Ursula's prior experience outdoors was mainly playing sports in urban settings. She arrived with some prior geologic knowledge which she had learned at school. Ursula had some interest in science as her future career goal was to be a doctor. However, she explained that prior to the residential experience she did not feel a connection to the natural world. During the trip she would sometimes answer the ecological questions being asked, but did not ask questions.

"This is my whole team"

While in the program, Ursula would engage in the lessons at hand, view sights pointed out to her, and would work on her homework when necessary, but any non-structured time was used to engage with her friends. There was a specific group she mainly interacted with and during her post-experience interview, she described a picture of the group as "This is my whole team. I remember them". The group consisted of her and her 2 female friends described above plus two male friends. The group was often socializing when they were in the same place together.

Evidence of her social focus was also found in her pictures, the most popular item she photographed during the trip were friends (15 out of 50), the second most photographed were landscape shots with no specific feature or animal in them (8 of 50). One picture was of everyone in her bus next to a lake, the rest were 'team' pictures or just her and one other friend or staff member.

In her video journal which she created with her friend Polly during the program they described the geological features and animals they had seen to date. They both agreed the most amazing thing was seeing the colorful hot spring. When both were asked what they would tell their family about their day?

> Polly: "You should go to Yellowstone because it’s pretty."
>
> Ursula**:** "You should go to Yellowstone because there is geysers. There is beautiful bacteria and a lot of stuff."

Ursula's first attempted to create a previous video journal, was interrupted by her 'team' members as she tried to record.

On the last day sharing out, participants used a picture to explain why the park should be saved, she used a 'team' picture in front of a lake, and explained “if people want to take really pretty pictures they can come here”. During that same sharing out, the instructors asked all the participants to share their favorite memories. Ursula was one of a group of youth who responded, "making new friends".

Unlike some participants, Ursula's discomfort in this natural setting was not marked by her running from or swatting at insects, instead she often verbalized her fears she brought with her and when aspects of the environment drew them out. She was afraid of heights and large bodies of water, and she proclaimed these fears as we traveled toward a canyon and large lake respectively. A situation that caused her fear and discomfort, was the inability of participants to lock their cabin doors. This will be discussed more thoroughly in chapter 3, the analysis of how participants culture and lived realities interacted with the program. For Ursula, several aspects of the residential program elicited fear or discomfort, however she was very comfortable facilitating social interactions with peers.

During her post experience interview, When she was asked how her pictures from the residential experience related to her life now, she talked about the friends she made and meeting new people.

> Actually, yes. I really miss my— well, one of them was my roommates, Polly. I really miss her. And just to be around different people that you didn’t know that came from different backgrounds and stuff. It was pretty cool just to meet people and be on a week trip with them.

In the same interview, Ursula's description of the best experience of the program was getting to experience new, novel outdoor things. She did not point out specific biological or geological subject matter they experienced.

> Basically just being away from home and experiencing all the outdoor things that I really never got to experience here.

I speculate that Ursula construed from my questions during the post experience interview, that I was trying to understand about her connection to the natural world. Which may have facilitated the answer above and her skipping over most the pictures with her friends in them, and only discussing three of the fifteen pictures.

It is difficult to discern if Ursula experienced triggered situational interest in the natural environment or if the triggered interest only lasted until social interactions occurred. Hidi's four phase model of interest focuses on content and not social interactions and thus is not applicable for her social focus. However, it appears Ursula's identity is strongly tied to navigating social interactions among peers and with chaperones.

Tammy's Experience: Making New Friends and Reinforcing Norms

Tammy attended a community youth organization club at the interface of rural and urban communities. During the residential program she was very social often instigating games with others on the bus as we traveled. She was something of leader, directing which games were being played and what other girls would do in their free time. One of her close friends from her club was also on the trip, Melissa. Tammy paid attention to what was going on around her and engaged in site seeing and filling out her junior ranger pages. However , once she was done with those tasks her attention was drawn quickly back to her friends.

Tammy had little experience playing outside in her own yard or neighborhood. She did have some experience in semi-pristine areas, as she said she often attended Girl Scout camps. Tammy enjoyed school, but had no strong connections to science. She arrived at the program

with some knowledge about the park biology and geology, and she described her connection with the natural world as " I always appreciated nature and thought it was great". In my participant observation notes she did not ask questions and was only recorded answering naturalist questions at the final day trivia questions.

Tammy's interaction with nature was mainly to utilize it as a place to play. She showed less discomfort in the natural environment then others in this group, which prior camp experiences may have facilitated. During unstructured time, when out in the natural world she would utilize the rocks and logs to bring friends too and play on.

Tammy's biggest focus appeared to be others, especially her good friend from club, Melissa. She created a video journal with her friend. They could talk about anything they wanted to for their video journal, but to give them structure I suggested they talk about the things they would want to remember ten years from now. Tammy starts by talking about a song she created, in passing she noted "we saw a bear and a wolves den" and "I'm excited about tomorrow". She then asks Melissa her favorite part and spends the remainder of her time describing the play they had made up to show fellow participants and staff. The video journal seems to be a distillation of her interactions with the natural world, which was a small part of her experience.

During a reflective time in the woods, participants were asked to use all their senses to describe the area around them. Tammy was the first to find a spot and finish the task and then asked me as her group leader, “what should we do when we are done”. I suggested describing the larger habitat around her. She instead pulled out her binoculars and found her friends reflecting and waved at them to get their attention. Eventually, she and a nearby participants began challenging each other to 'taste' their surroundings. Tammy tasted sage and then

challenged me to try, which I did. This scenario shows when Tammy interacted with the park it was often socially motivated, and she would motivate others.

During the final day sharing out, she used a picture of a bison through the bus window, with the word educate in the window, to argue for the preservation of the park. The instructor was pointing out the poignancy of the picture, but Tammy admitted she did not know the word was in the picture. Tammy argued that if a member of congress traded places with the bison and then the park was destroyed, they would not be happy or alive. The chaperones and instructors appeared impressed with her case for park protection, as the instructor noted she 'wanted Tammy on her side'. Interestingly, the bison picture Tammy used was one of only three pictures she had of animals, a major focus of the curriculum and experience.

Other evidence of her social focus was the subject matter of her pictures, 24 of her 50 photos were of friends and chaperones, mostly taken inside the bus. Her next most popular image was hot springs with 13 pictures. When I went through her pictures in a post-experience interview approximately a year later, she was able to name almost every person in the pictures. She described her most memorable experience as

> Either seeing the wolves' den, which was pretty cool, and hearing the stories— it was both the wolf den and stories, and the meeting new friends and stuff, even though I am not in contact with them anymore.

It is unclear if Tammy had triggered situational interest in any specific subject matter or the natural environment. She interacted with the curriculum enough to make a compelling concluding argument, what is unclear is if that was due to a triggered situational interest or the necessity of required assignment. Similar to Ursula, the Hidi four-phase model cannot be applied to her social focus, as the model focuses on content matter.

Tammy's identity appeared strongly tied to leading social interactions and on several occasions Tammy also made comments reinforcing gender stereotypes. Such as commenting when a male participant screamed because of bug, that he sounded like a girl; and another male participant looked like a girl because how he was dressed; and finally asking a male chaperone to carry something because it was heavy he was a boy and boys are "big and strong". As adolescents tend to do, was Tammy trying to reinforce the gender rules as she knew them?

Synthesis

According to Maslow's (1970) hierarchy of needs theory, both belonging and a feeling of safety must be met before intellectual achievement can occur. For both of these participants, they were very capable at facilitating social interactions and thus peer belonging. Ursula, similar to Adela and Marco, arrived with fears that interacted with the context of the park. Smith-Sebasto and Walker (2005), using grounded theory, found the most important thing for thousands of student's age (10–14 years) who participanted in a residential environmental education program was safety, even though it was a small part of the curriculum. The authors noted that making students feel safe could help maximize learning.

In the same study the second most meaningful thing for the students was social interactions. The authors believed this was in part because of the curricular focus on team work and self confidence and also because of the desire of youth to fit in (Smith-Sebasto & Walker, 2005). These findings testify to the importance the social aspect of learning, especially for adolescents.

These residential program participants came to the program with little knowledge and little to some experience in natural settings, and with a strong social focus. Socializing is an

important part of learning at any age. As James and Bixler (2008) argued in their study children attending a residential environmental education experience where socializing was also found to be important, "Whether people become and remain attentive and interested in the environment may well be more related to the quality of the many informal direct experiences with environmental things and spontaneous social interactions."

For Ursula and Tammy, the social interactions did not seem to enhance their engagement with the environment. However it did make the experience meaningful to them. It is important in any environmental education program to recognize youth's strong focus on being social and utilizing that desire to help facilitate programmatic goals.

Conclusion

In a residential environmental education program the natural world is at the center of the curriculum, serves as the classroom, is an object used for demonstration and learning. This study suggests that participants interacted with the natural world, as it served those myriad of functions, differently. Using an ecological model of learning lens to understand participant's experience and meaning with features of place, three stances emerged: (a) engaging deeply with the place, (b) visitor/viewing of the place, and (c) socializing in spite of the place. With a recognition that every participant's experience of the residential program was unique, an understanding of the different types of interactions with the natural world is an important first step in discerning how an individual's cognitive, social, and cultural experience affected their learning process in a residential environmental education setting.

Most residential environmental education research to date describes post experience changes in cognition, attitude or behavior, but none have elucidated how the participants actually

experienced and ascribed meaning during the program. The study that comes the closest is James and Bixler's (2008) study of gifted children attending a residential program, in which they used domain analysis to understand "children's lived experiences". The authors found the emergent themes; the importance of unstructured interactions, social interactions, and perception of choice, but did not discuss experiential differences. Making visible the differences in interactions with the natural world, is imperative to understand learning outcomes—especially for individuals who come from non-dominant communities and are often experiencing these natural settings for the first time. The theoretical stance used in this research has not been applied to a residential environmental education program before, and may serve future studies trying to understand learning in those environments.

Previous environmental education research has described the importance of knowledge and experience in creating an environmental connection. A meta-analysis of environmental education literature has shown that knowledge does not lead to a desire for stewardship or connection to the natural world, but it has been shown that some is necessary for a connection (Kollmuss & Agyeman, 2002). It has been found that frequent and repeated exposure to the natural environment, even in urban settings, leads to a comfort and connection to the environment (Strife & Downey, 2009). The individuals in the most engaged category in this study arrived with high levels of knowledge and experience. However, not all participants with high levels of knowledge and/or experience had the same level of engagement in the natural environment.

Some participants with much prior knowledge (who were in the gifted track in school or answered many naturalist questions during the program) and/or had significant, similar prior experience (i.e., had been to multiple camps or were boy or girl scouts) were not consistently

engaged with the natural world. From this study, it appears knowledge and experience, may serve as a necessary precursors to identifying with the natural world, but having knowledge or experience did not necessarily create an identity tied to the environment. Knowledge and experience may also serve to facilitate triggered or individual interest in experiencing, understanding, and interacting with the natural world.

The relationship between interaction categories or stances and interest appeared reciprocal. The individuals used to define the engaged category came with sustained individual interest, and the visitor/viewers experienced triggered situational interest. The individuals in the social group did not fit into Hidi's four phase model of interest, as the interest model focuses on content.

Social interactions and safety concerns are not accounted for in Hidi's model, but have been found to be important to adolescents attending residential environmental education programs (J. J. James & Bixler, 2008; Smith-Sebasto & Walker, 2005; Tzou, Scalone, & Bell, 2010). This study also suggests a need to recognize the importance of socializing and attending to safety concerns as a part of a participants experience. Future design based research studies, should focus on creating conditions that recognize, respectfully surface, and work to decrease fears, while utilizing adolescents psychological need for belonging and socializing, to foreground the natural environment.

What part did identity play in the participants interaction with the natural world? Lim and Barton (2010) use the conceptual construct of "insideness" to understand middle school youth's "sense of place" within their urban neighborhoods. Insiders, as they describe, know how to navigate and identify with place, and "attempt to experience a place fully, empathetically, and

sympathetically". The authors argued how youth experience a place is driven by "attitudes and intentions", how they identify with place, and what a place can provide.

> Children's positionality is an expression and exertion of their place identity:
>
> who they are, who they want to be, what they value, and what they seek in a place.
>
> At the same time, positionality is a reflection of the affordances (perceived, used,
>
> and/or created)... (p.335)

The youth within the engaged category of this study, would fit into the insider construct, as it appears their environmental identity (i.e., their identity related to their connection to the environment) overlapped and had a synergistic relationship with place identity of the National Park. I would purpose that the interaction of these individuals with place helped create a sense of agency which allowed for the level of engagement not seen with other participants. The visitor/viewers and those with a social focus lacked the environmental or place identity and did not develop a similar sense of agency to engage with place. I believe that the individuals who had a social focus, had an identity and skill set in their home, school, and/or club environment which allowed them competently negotiate social situations. Thus they put their energies in the space they identified with, the social context.

This study is significant as it is the first to try and understand how the context of a residential environmental education program interacted with participant's identities. It also the first empirical research showing that participants identity's influenced how participants of a residential programs engaged with the natural world.

Work in informal settings has shown identity can drive expectations and thus interactions within informal settings. Falk et al (2008), found a majority of visitors to a zoo and aquarium fit

into "five distinct identity-related categories". They found that individuals in the identity categories had expectations about what they would get from a zoo/aquarium, and then they sought out experiences that reinforced those expectations (John H. Falk, et al., 2008).

> In other words, for a majority of the visitors we studied, their entering identity-related motivations revealed some measure of predictability about what that visitor's experience would generally be like (Falk, 2008).

The researchers recognized, as does this study, that each individuals experience was unique, but the categories, Falk argued allows some predictability on what expectations and interactions (experience) will be for individuals within the categories.

In this study, category creation was based on interactions with the natural environment, not identity related reasons for the participants to be a part of the residential program in the first place. However future studies should focus on understanding more the relationship between identity and experience categories. Are the environmental identities and/or place identities for residential environmental education program participants what drives their expectations and interactions and helps explain the interaction differences? If so which identities are most important in creating expectations and motivation for interaction with the natural world? Are there programmatic ways to facilitate identity development during a residential program? Or is it a sense of agency, not identity, that allowed for interaction differences, and if so how could the context of a residential program develop a sense of agency for youth.

This current research and proposed future word would allow for an understanding of how participants' identities affect how they experience a residential program and ultimately what they take from it. The recognition of the role identities play in the dynamic interactions of participants with the residential environmental education setting (the natural world) could

improve the experience and outcomes for participants. I believe a clearer understanding of the intersection of a residential program experience, identity, and agency could help environmental education to reach its goal of creating youth engaged with and wanting to steward the natural world.

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Chapter 3

How a Residential Environmental Education Experience Influences Learners Interest, Identity, and Stewardship

Introduction

In the previous chapter, I analyzed how the prior knowledge, experience and context of participants of a residential environmental education program affected how they connected and interacted with the environment. Participants' unique background and motivations created a distinctive connection to the natural world, however varied patterns in levels of engagement with the environment were observed. The three general stances that emerged through the analysis were: (a) engaging deeply with the place, (b) visitor/viewing of the place, and (c) socializing in spite of the place. Understanding that there were different ways that students engaged begs the question: are there different types of long-term impacts?

This study attempts to understand the long-term impact of the residential program on the participants' connection to the environment. Environmental connection is defined, in this study, as a participant's interest, identity, and desire to steward the natural world. Identity and interest are important strands of learning, especially in informal learning environments (Bell, et al., 2009) and stewardship is one of the goals of this residential program. How interest, identity and stewardship are conceptualized and then empirically operationalized is discussed in the following sections.

Until recently there has been little use of retrospective program evaluation to discern the lasting impacts of environmental education programs. In an article addressing the long-term

impacts of environmental education, Liddicoat and Krasny (2013) defined evaluation one-year post program experience as the delineation of short versus long-term impact. They also noted that long-term program evaluations ranged from 6-months to forty-five years after the program (many of the longer range evaluations were Significant Life Experience studies). One-year is the standard for evaluation of "memories and lasting impacts", however, the authors recognized length of time utilized in researching long-term impacts was usually determined by logistics more than theory (Liddicoat & Krasny, 2013).

Knapp and Benton (2006) noted that informal education research has looked at memory and long-term retention of information after attending museums, field trips, and science centers. However, there were few attempts to understand long-term affects and memory creation after a residential environmental education experience. Thus the authors interviewed ten fifth graders who participated in a 5-day residential program at Yellowstone National Park a year after the experience. They found that active experiences were "influential in forming long-term memories and knowledge associated with the program" (Knapp & Benton, 2006, p. 175).

The purpose of this chapter is to engage the following research question:

> Did this residential environmental education experience create long-term changes in participants' connection to the natural world, specifically, in terms of environmental interest, stewardship, and identity?

This chapter includes a section on participants who pursued interests after they returned home that arose during the residential program. This if followed by a discussion of the findings that identities shifted for some participants after the experience, however, for only one was the identity change tied to the environment. Stewardship and perception changes were also seen and are discussed below. In the final section of this chapter, information about how and when

participants were able to revisit the experience is presented. The conclusion will discuss how the results can inform the design of future residential programs.

This research adds to the education discipline by providing a new understanding of the changes created by a residential environmental education program in terms of youth identity, interest, and stewardship. It also contributes to the environmental education repertoire of outcome variables and to the dearth of empirical research on long-term impacts of residential environmental education programs.

Theoretical Framework

The theoretical framework for this study draws upon previous theory and research that focuses on the diversity of students' learning outcomes and how outcomes are associated with students' background and motivations and the learning context. An "ecological framework" on learning was used which takes into account "cognitive, social and cultural learning processes and outcomes that are shaped by distinctive features of particular settings, learner motivations and backgrounds, and associated learning expectations" (Bell, et al., 2009, p. 31). The learning outcomes focused on in this study were changes in environmental connection defined as interest, identity and desire to steward the natural environment.

Interest is characterized by a focused engagement or attention on a subject that leads to positive emotions and emerges from an individual's interaction with their surroundings (Renninger & Hidi, 2011). According to the Hidi and Renninger (2006) model of interest development, student's initial level of interest has a profound effect on learning, attention, and goal setting. The authors define a four phase model of interest, which includes: triggered situational interest stimulated by external context; maintained situational interest which is sustained by the individual; emerging individual interest in which the individual seeks repeated

engagement; and well-developed individual interest where the individual re-engages over time (Hidi & Renninger, 2006). Individuals who pursued new behaviors or interactions with the natural world after the residential program were considered to have a change in interest.

Identity is an important construct which allows for an understanding of how people see themselves in the world and how others perceive them (Kane, 2012). In this study, identity is defined as how a participant understands themselves in relationship to place, people, practices and objects. A person possesses multiple identities, and those identities are highly dynamic and can be understood to be created with "culturally and socially constructed discourses and practices" within "figured worlds" (Holland, Lachicotte, Skinner, & Cain, 1998).

Research on how people learn science in informal settings describes identity as an important strand of learning, especially for those from non-dominant communities (Bell, et al., 2009). It is also understood that each individual has multiple identities (Lee, 2008), and identities can determine how individuals interact with their surroundings (John H. Falk, et al., 2008; Lim & Barton, 2010). Furthermore, what an individual gains from a learning experience is influenced by identity (Bell, et al., 2009).

In chapter 2, the participants' identities affected how they interacted with the National Park or aspects of the natural world. The participants who engaged most with the National Park had an identity tied to the natural world, while the other participants did not. Those few who were 'naturally engaged' fit into Lim and Barton's (2010) construct of "insiders", individuals who identified with place, and the affordance of place and because of their "attitudes and intentions" interacted with the natural world at a different level than other participants (Lim & Barton, 2010).

Recognizing that identity affects experience and experience affects identity, this chapter aims to understand long-term, post-experience changes in participant's identities. Individuals who expressed a change in themselves that they attributed to the residential program are described in the change in identity section below.

Stewardship is the ultimate goal of environmental education and was one of the goals of this program. In this study stewardship was defined as behaviors or a desire to take action to prevent environmental degradation and protect the natural world. Participants who expressed a new desire to become stewards after their residential experience are described in the change in stewardship section.

Research Design: Methods, Data and Analysis

This case study involved evaluating changes in interest, identity, and stewardship of students who engaged in a unique residential environmental education program. Data were collected from youth who participated in this annual program over a two-year period. Seven participants per year were interviewed between 9 to 19 months after their residential environmental education experience. The residential program participants' parents or guardians were contacted by employees of the community youth program to ask if their child would take part in a post-experience interview. Interviews were voluntary and were arranged at the clubs after consent forms were signed by the parents or guardians. Interview participants received a gift card to compensate them for their time. The interviews were semi-structured and varied between 20 and 40 minutes long. There was a slight refinement in the interview questions between the first and second year in an effort to increase understanding of students' interaction with the environment and stewardship beliefs. In the second year participants were asked how

often they took part in specific outdoor activities and how important they thought it was to protect specific plants and animals.

Contacting participants for post-experience interviews was difficult in many ways; some participants aged out of their clubs, some clubs closed, staff contacts at the clubs changed, families moved and some families did not want to participate. These difficulties contributed to the variability in time after the residential program of the post-experience interviews. The difficulty I experienced setting up interviews with the first year cohort facilitated earlier interviews in the second year to overlap with participants who attend club during the school year. Thus, interviews for the first year cohort were from 15 to 19 months post-experience. The interviews for the second year were between 9 to 12 months post-experience.

These interviews are the only data collected after the residential program and the interviews were structured to understand participant changes. In particular, the interview questions were created to discern if participants maintained or changed their interest, identity or stewardship towards the natural environment over the elapsed timeframe. Also, questions existed to understand if there were changes in participants' connection to science, as it was much of the curricular focus, and to school. There were also questions to discern how frequently participants revisited the experience.

Additional data, participant observation and artifact review (pictures, video journals, thank you cards) were used to triangulate results when possible. The use of the semi-structured interview was to give participants voice and allow for flexibility to follow lines of inquiry created by participants. The interviews gave participants the opportunity to share what they were thinking, feeling, and memories about their experience (Merriam, 1998).

The Residential National Park Program:

This five-day and four-night residential environmental education program occurred in a National Park located in a different state than where the participants lived. All of the participants attended the same regional community youth organization situated in a medium sized city in the Pacific Northwest. However, participants attended several different clubs within that organization. The participants chosen to attend this program were mostly eleven years old and entering 6th grade in the upcoming academic year. For the majority of the participants, it was their transition summer into middle school.

The participants were from diverse ethnic and socio-economic backgrounds. One of the selection criteria for participation was that the children chosen would likely never visit Yellowstone National Park without this program. A more detailed description of the program, participants and setting can be found in Chapter 2.

Research Findings

In the post-experience interviews it was revealed that some participants continued pursuing interests that began during the residential program afterwards. For others there were identity shifts that they attributed to the residential experience, and for a few their desire to steward the natural world changed after the program.

Triggered situational interests that occurred during the residential program were continued afterward in various ways by Ed, Adela, and Marco. The interests pursued by these participants included; spending more time outdoors observing plants and animals, talking more about nature, fishing and camping for the first time.

The individuals who appeared to have a shift in identity or stewardship are described in the respective sections. One participant, Adam, fit into both as his identity shift was toward a career as a steward of the natural world. However, his change is described in the identity section because of his potential career choice change. Note that some of the participants that experienced identity or stewardship changes also experienced changes in interests. However, individuals with interest changes did not appear to have changes in their identity or stewardship focus.

In this study, three participants had a shift in their identity, however only one was in relationship to the natural world. Adam, whose experience during the residential environmental education program was described in Chapter 2 as one of the engaged participants, had a very vivid dream which made him contemplate a new career choice, becoming a naturalist. Emilia, who prior to the residential program, was picked on for being intelligent, came away from the experience believing she was able to make friends, something she had difficulty doing before the residential program. Tasha, also claimed that because she could not get in trouble without losing the privilege to go on the trip, she had changed, and learned to 'be good'.

Stewardship was one of the goals of the program, however the message may have been more subtle than the instructors realized. For many of the participants interviewed, they left with an attachment to the National Park and they wanted it protected. However, for only a few did the stewardship message translate in a desire to do something themselves, or to steward beyond the park. Matthew and Lori expressed their continued desire to be stewards many months after the residential program.

In this analysis, environmental connection is defined as the participants' identity, interest, or stewardship of the natural world. However, it is also important to understand environmental

connection from the participants' perspective and on their terms. Below are data to show how the participants described their connections to the environment or natural world before they participated in the residential program (Table 1). The majority of the participants who claimed a connection to the environment explained their connection to nature by describing the amount of time they spent outside playing. Adam's and Matthew's connection to the outdoors centered on their love of animals and getting to see and learn about them. Whereas, Nereus had a general like of the outdoors. There was a group that claimed no connection to the physical environs of the natural world prior to the residential program.

Table 4

Participant Self Described Connection to the Environment Prior to Residential Experience

Animals	**Enjoy Playing Outside**	**General Like**	**None**
Adam (learn)	Adela	Nereus	Ursula
Matthew	Levi		Emilia
	Samantha		Tammy
	Marco		Ed
	Lori		Tasha (fear)
	Melissa (learn)		

*The words in parenthesis were also self-described as being important in their connection or lack of connection to the environment

Changes in Interest

The Hidi & Renninger (2006) model was used to analyze experiential differences during the residential program. It was found that many participants experienced triggered situation interest in objects they were seeing or learning about, and a few arrived with well-developed individual interests they maintained during the program. This study investigated if any interests were continued or new ones pursued after the residential program. For three of the fourteen

participants interviewed, they changed the type and amount of interactions they had with the natural world. For Marco, Adela, and Ed, the situational interests from the residential experience led to emerging individual interests.

Marco: Goes Camping

Marco is a Caucasian male who arrived at the residential program with little knowledge about animals in the park or the park itself. His prior experience in natural settings was mainly playing sports in his own yard and spending time on a beach, when he lived near a lake. He described his connection to the environment prior to the residential program as a place he enjoys playing in. While he was in the National Park, Marco interacted with the natural world as a visitor/viewer (see Chapter 2).

For Marco, the National Park provided a stark contrast to his city life and expanded his perspective on what exists outside of his urban reality. He was amazed by the National Park's vastness and described the expansion of his perspective nine months later, in an interview.

> I think how the world's like different. Like, I think differently of it now. It's not just like all buildings and stuff.

Marco admitted he had no idea what the National Park would be like, even with three pre-event field trips. In his description of how he feels about the Yellowston, Marco again, describes how different it was from what he had experienced before or what he could imagine.

> It was like amazing. It was like— it was like different. I never thought that it would be like that big. Like I didn't know there was like mountains and like trees like I thought it was just like a couple mountains here and then like— I didn't know it was like that huge. Like I said earlier— different from buildings and stuff.

His realization may speak to Marco's constrained personal geography prior to the residential program. His new vision of the world promoted a pursuit of additional 'outdoor' experiences.

When he returned home, he continued the situational interest of being in semi-pristine environments by camping for the first time, and multiple times that summer.

> I went camping like three times because I liked going out. I had never been out in the wilderness. Like I never knew what it was like. So I wanted to go camping.

Marco described his camping outing as consisting of tents and camping in the woods. It was unclear who he went camping with him, but someone in his life was able to facilitate his desire to go camping.

The residential experience expanded Marco's understanding and created a desire to continue to experience wilderness, but in a new way, by camping. An expansion of his understanding of the natural world led to an emerging individual interest to continue to interact with wild spaces.

Adela: Continuing to Experience Nature in New Ways

Adela, an African American female, prior experience and connection to the natural world were, in her own words, associated with playing in her yard. She had some prior knowledge of Yellowston that she looked up before the actual residential experience. A description of her residential experience can be found in Chapter 2, as an example of the visitor/viewer stance of interacting with the natural world.

During Adela's residential experience, she expanded her comfort zone and experienced triggered situational interests interacting with nature. She experienced nature in new ways, such as hiking and touching animal bones found around the park. During the post-experience interview, 19 months after the residential program, Adela was asked if she had done anything in that time related to the residential experience. She said she had been and enjoyed fishing and

tied it to an experience of seeing a raptor catching a fish during the residential program. Also, she stated a desire to visit a local National Park.

> I have been asking my dad if we can go to *the local National Park*, but he hasn't taken me yet. I like going fishing. After we saw like the birds drop— swoop down and get the fish and he caught it—

Adela also noted that she spends more time outdoors playing since the experience and saw that as a 'good habit'. This shows an increase valuation of being outdoors after the residential program. In addition to fishing, she and her family also started camping in their back yard.

> I like being outside more. Like ever since then my dad has bought a tent and like a whole bunch of sleeping bags and we sleep in the tent, like maybe like five times last summer.

Adela explained that the her parents observed post-program changes in her, in that she brings up nature in her conversations with them, "They say I talk about nature more". Her new focus on nature in conversation and her new experiences serve as evidence of Adela's uptake of new social practices.

Since the residential program, Adela took part in several experiences with nature. When she returned home, she pursued her interests by camping and fishing locally. Her family helped to facilitate the continued pursuit of her interests by purchasing camping gear and taking her fishing. Therefore, her expanded interest in nature also influenced her family's experiences and interactions with the natural world.

Hidi and Renniger's (2006) argue that situational interests are tied to emotion. However, as individual interests develop, "knowledge and value develop concurrently". For Adela, knowledge and value both seem to play a part in her post-program interests and experiences. Her message to the upcoming year's participants was about learning. She noted that the residential experience was about more than just seeing things, but also learning.

> You learn a lot. It’s not just like going on a vacation. You actually learn. You are getting involved. It is really interesting about how much stuff you learn...

She also explained that some of the things she learned during the residential program, she used in her science class the next year.

The value of being outside also seemed to have developed for Adela. This can be seen in her suggestion to next year's participants to keep up the "good habits" they gain during the residential program, specifically, of being outside every day. She also suggested that when they return home, do not just watch television like she used to and spend time outdoors. Adela suggestion was based on the displacement of her old practice (television watching) by the new one (being outdoors).

Adela's prior connection to the environment was simply playing outdoors. She experienced a variety of situational interests in Yellowstone, and maintained an individual interest in being outside, talking about nature, and also experiencing it in a different ways. The maintenance of her individual interests was facilitated by her family and her knowledge and value development.

Ed: Seeing Plants and Animals

Ed, a Caucasian male, prior to the residential experience had very little knowledge of the National Park's biota or geologic features. He also had very little experience playing outside, even within his own yard. It appears he had the least amount of experience of the interviewed participants, being outdoors in any setting. Ed also said he felt no connection to nature or the environment before the experience.

Ed said after the residential experience he spends more time outdoors playing in his yard, playing sports and observing plants and animals. He noted he looked for plant and animals around his neighborhood and in local parks.

> I wanted to see more animals and kind of study the animals and, you know, plants— I wanted to see different kinds of plants and all that.

For Ed, the residential experience centered around seeing animals. This translated into a desire to continue his observations. Throughout the interview, he neither expressed a love of animals, as other participants had described, nor a desire to return to wild lands. Instead, the experience seemed to introduce Ed to new organisms in the natural world, which translated into a desire to see them more. Thus, after the residential program he sustained his individual interest and spent more time outside and observing plants and animals and playing.

Synthesis

The interests that were sustained after the residential experience differed for the three participants above. It appears these differences may be tied to their prior connection to the environment and interests triggered during the residential program. Marco had no comprehension what the semi-wild National Park would be like, and it appears that learning about wilderness created an interest to go camping in the woods. Adela came to program seeing the environment as 'the outdoors' where she plays, and during the program she was introduced into new ways of interacting with the natural world. This led to a interaction with the natural world more by playing outside more and also by trying new experiences, like camping in her yard and fishing. Adela also expressed a desire to visit the local National Park, which appears to be facilitated by the residential program. This had not occurred, but speak to the potential of residential programs in National Parks creating the desire of participants to visit local options.

Ed said he had no connection to the environment prior to the experience, and looking at plants and animals was the situated interest that persisted after the program.

Adela and Marco had adults in their lives willing to help them pursue their new found interests after the program. Research by Barron (2006) has shown an expertise development in adolescents was linked to having multiple social supports for ongoing learning. Parents and other adults serve an important role to help youth access resources and experiences to continue the pursuit of their interests.

Changes in Identity

By listening to the participant's stories about their experiences, feelings, and thoughts, before, during and after the residential program, I believe, they were narrating their identities. The stories they shared in the interviews "position them as the people they believe themselves to be at particular moments and who they hope to become in the future" (Kane, 2012). In the following section, three participants, Adam, Emilia, and Tasha describe their identity shift.

The original focus of this study was changes in identities related to the natural environment. However, as participants revealed how they saw their non-environment related identities change due to the residential program, those stories were also included since these are also outcomes of the program that are worth understanding.

Adam: Dreams of a Different Future

Adam is an African American male, who came to the residential program with much knowledge of animals and the natural world and more experiences in semi-wild places than most other participants. He was one of the "insiders" who consistently engaged in the natural world

during the residential experience, and spent much time and effort viewing and identifying small mammals.

Adam had an identity tied to story-telling. He wrote a story that he shared with me during the residential program, which is discussed in Chapter 2. He explained during the post-experience interview that he planned to be a writer in his future career.

> I want to be on the storyboard for game designing, because I really like writing and I read a lot. So, I know a lot of different techniques....

Adam goes on to explain in the interview he had a current story. This story came about from an assignment and grew into something more, which is how the story he created during the residential program and shared with me also began.

> ....and I am writing a little short story right now that I have been working on for a little bit. I don't have it with me, but I think it's pretty good. It started as a writing project for language arts class and just escalated into me having a lot of fun just writing it, coming up with things.

Unlike the rest of the interviews, Adam's interview took place on two separate days four months apart due to his ride arriving half-way through the interview. The first half of the interview took place 15 months after the residential program. The second interview was 19 months after the program, due to scheduling issues.

One of the first things Adam brought up in the second part of the interview was a dream he had that was impactful. I had asked him, 'Have you done anything related to the residential experience?'. He begins by describing how he used the knowledge he gained about food chains in his science class the next academic year and finishes with:

> Adam: I had this really crazy dream once, referring to Yellowstone.
>
> Investigator: What was it?
>
> Adam: It was kind of freaky, but I was a naturologist [*sic*] and I was studying rare and unique animals. And this actually kind of freaked me out a little bit.

The dream was so vivid that he said he could remember the feeling of one of the animals brushing up against him. It was also realistic enough to prompt Adam to research on the Internet whether the made up animal in the dream was real. The length of time between when he had the dream and when he was telling the story is unclear, however, the details were still vivid. This part of the interview was 19 months after the residential experience.

> Because in the dream I was in a submarine and it was like kind of in the future for some reason, but I was in the submarine and I was diving down to Atlantis because in the dream— I had a dream about this animal called the Voxeye Narwhal. I don't know where I came up with that, but it just seemed— and so, to me, the narwhal looked like a regular narwhal except that his body was pink. And it was pretty smart and it had these weird protrusions on the top of its head where you could kind of see like bits of its brain. And they were glowing pink and it like radiated light. So, apparently they've in my dream they were living in Atlantis all these years after it sunk, so I went down and I had to swim into Atlantis because the submarine wouldn't fit. And there was all this garbage everywhere from people dumping stuff in the ocean. There was just garbage and the water was grey there. It kind of reminded me of a sewer. I think I swam in through the sewer of Atlantis and I made it to the top.

It is interesting to note that the ecosystem in his dream (aquatic) is nothing like Yellowstone with mountains and forests and some lakes. However, the dreamscape and Yellowstone have in common endangered species, living in a disappeared land which are surrounded by pollution or potential negative influences. The fact that Adam saw this dream as related to the residential experience shows he understood some, if not all of the shared traits between the ecosystem in his dream and the National Park.

The dream appeared to leave quite an impression on Adam. Throughout the interview, Adam continued to bring up the dream. When asked what he thought the dream meant, Adam replied:

> If I don't— I'm pretty sure it is saying if I don't go with the— if my first job choice that I want doesn't work out, I should become a naturologist [*sic*].

Adam's was referring to being a naturalist, someone who studies animals in their natural environment, to both understand and protect them. Showing my bias, I suggested that maybe he could pursue both interests—naturalist and story board writer—in the future and help save the Narwhals (the real whales), to which he replied:

> Voxeye narwhals**.** I'm pretty sure I am going to try to— if I do, I am going to either try and include them in my story that I am writing right now— I am going to add like an ocean area somewhere in between that line of concept. And I am going to try and get them in the game.

The fact Adam used a story in the form of a dream, to express his own identity shift seemed very appropriate since stories are how he expressed himself to me during and after the residential program. His self-described love of animals appeared to have interacted with his story-telling identity and the National Park (place identity), and turned into a desire to study and save "rare and unique animals" (practice-link identity). Adam's identity did not necessarily shift his career choice, but instead expanded his options to include another potential career that overlaps with his love of animals and a desire to understand and protect them.

It seems Adam may have had the dream sometime between the first and second half of the interview as it was not mentioned at all during the first interview. However, the first part of the interview involved questions related to before the residential experience and going through his pictures that were taken during the residential program. If the dream happened in between interviews, it perhaps speaks to what can come from reconnecting to the residential experience. In this case, the reconnection was through the interview process.

The identities that Adam brought to the residential program as story-teller and animal lover affected how he interacted with the natural world (see Chapter 2). The post-experience interview revealed that the interactions of the residential program served to shift an already well-developed identity beyond interest in the natural world to wanting to protect it.

Emilia: Learns to Make Friends

Emilia, is a non-Caucasian, female who first stood out to me during one of the pre-trip events that took place. During this event, she talked about her favorite teacher and downloaded many of the things she had learned that year in school, including being able to count to 100 in Japanese. Emilia had an interest in learning and described herself as being "smart". She arrived at the program with some knowledge about the animals in the park and geologic features.

Prior to the residential experience, she spent many hours outside each day in her yard, playing sports and going to a nearby park. Even though many other participants used their outdoor play time to describe their connection to the environment. Emilia said prior to the residential experience she did not feel a connection to the outdoors or nature. Emilia: "No, not really. All I do is play outside and climb on trees and jump out". She did not see interactions with her local surroundings as a connection with nature or the environment. During the residential experience she participated in a way that fit with the viewer/visitor interactive group.

When she was asked to describe her experience with the residential program, her focus was on how she gained confidence in her social abilities afterwards. She credits the residential experience with being able to make friends the next year in school.

> What we did in Yellowstone was amazing. Like, because before Yellowstone I wasn't having a good time. I was being picked on in fifth grade by a person I will not name. And, like, after I felt more— cause I made more friends along the way and I had a friend-making experience. So I can make friends here, too, because I don't really have many friends. And during Yellowstone, I loved it because I made new friends and they accepted me for who I am.

For Emilia, the residential environmental education experience was seen as a "friend making experience". She had moved into middle school the next academic year after the residential program and thus changed school environments. However, she credited an ability to

make friends during the program as what changed and improved her school experience the next year.

The importance of the social aspect of residential programs has been observed in previous studies. Sebasto and Walker (2005), using grounded theory, found the second most important thing (after safety) for thousands of students aged 10–14 years old participating in a residential environmental education program was social interactions (Smith-Sebasto & Walker, 2005). This testifies to the importance the social dimensions of learning, especially for adolescents. Peer relationships increase importance for youth entering middle school as their understanding of friendship develops.

When I asked Emilia, would her family say anything had changed about her after she returned from the residential program, she initially answered "no". However, she followed up by saying that her family had noticed her increased social comfort and happiness.

> They said I was a little bit more happy. Because I didn't get picked on anymore. I always get picked on because I'm smart.

The residential program allowed for a low stakes environment for Emilia to try and develop friendship, which she did. She was not marginalized by her roommates or others for being smart in this context an important feature for a learning environment.

When reviewing Emilia's pictures 11 months after the residential program, she retained many details about the subject matter and the story behind how the picture came about. The example below is her description of a picture of a red moon that was observed one evening. It was a unique experience for her, however, the social aspect of the experience appears to also be what made it memorable. She described how she and her roommates stumbled across the moon, with the help of a chaperone, and then they shared the experience with the others.

> What I remember is it is one o'clock in the morning, and me, Carmella and Tameka were still up talking and laughing. Then I walk out to get Tameka's

> water bottle, and then Ms. Allie sees me and she is like, come on, look outside, and then I walked out onto the deck and I saw this red moon. Basically it's like a lunar eclipse, but I am not sure if it was. And I got everybody— all the other girls who were still up, out, to take their pictures—and all the flashing and everything— I was like, oh, I'm blind.

Emilia bonded with her roommates and then other participants. On the final day of the residential experience, all the participants put together plays, skits, or musical numbers. Emilia created a play with her roommates, a scene in a Japanese restaurant. Her knowledge of Japanese helped create the play setting and story-line. Thus, in the context of this residential program and this sharing out experience, her knowledge became a social asset. This culminating social experience, along with the other positive social situations that occurred during the residential program, allowed Emilia to see her own social abilities, which became part of her identity (she embraced).

Emilia came to the experience self-identified as "smart". That identity led to negative social interactions and being picked on, prior to the residential experience. She took from the residential experience a new confidence and identity, specifically one who is able to make friends. Emilia attributed that new confidence to her successful 'friend making experience' during the residential program.

Did this identity change affect Emilia's connection to the natural world? Emilia explained in her own words, "I like the environment more". At the National Park, she saw clean rivers and streams and how nature 'used to be'. However, she argued the natural world she saw at the National Park does not exist in her immediate surroundings.

> Like— because over there it is like so pretty, but we don't have that here. Like there is like certain places where we can go out here that I researched. Like— because the rivers and stuff that they have out they are more cleaner than what we have out here. Like *Local Lake* is all dirty. And you can't see the water. And it's like so dirty you can't even see your fingers when you put them in. And like, out there it is so crisp and clear. And it's— like you could actually see what's in there.

The difference she saw between the semi-pristine National Park and a local urban lake, seemed to reinforce her belief that her urban surroundings were not part of the natural world.

Emilia case shows the importance of residential programs creating and facilitating a space where individuals can be "smart", or however they identify, and not be persecuted. This type of space is important for the learning process and helped her in an identity shift. Her case also shows a missed opportunity, where she came to the residential program and left believing the natural world consisted only of the semi-pristine places, thus not allowing for a connection with her local, urban environment.

Tasha: Learns to Be 'Good'

Tasha, an African American female is a self-described "city" girl. Tasha had some prior knowledge of the animals and features of the park before participating in the residential program. Much of this knowledge was gained at school and during the pre-program field trips. The outdoor experiences she brought to the program was mainly playing in her yard or at playgrounds. Additionally, she had some experience living and playing near a creek.

Before the residential experience, Tasha did not feel a connection to nature or the environment as she explained she was "scared of most animals". She admitted that she was also scared to go to the National Park because of her fear of animals. Her motivation to participate in the residential program was her mother, who thought it would be good for her to have an adventure and push her boundaries. During the residential experience, Tasha was part of the group whose interactions were focused on socializing with each other more than the natural world. Tasha's social focus during the residential experience was also evident during the interview. Throughout the interview, her friends were waiting for her outside the door, and her attention was frequently drawn to them.

In the post-experience interview, Tasha described her favorite experiences of her week at the National Park as seeing things and the free time participants had where they could just hang out. Free time was found to be important to participants in a previous study on meaning making of "gifted" 4th and 5th graders during a residential program. The authors found that it was one of the domains that emerged as important to participants' experiences and argued free time contributed notably to learning within the informal setting of a residential program (J. J. James & Bixler, 2008).

> I liked seeing the stars and stuff.... I liked waking up early to go see what we would see for the day I liked mmmm..... In the middle of the day it is just chill time to hang out with everybody and race and stuff.

During free time participants would race each other. Tasha's interview response reminded me that she not only participated in racing, but often won. I thus I commented, "I remember the races you would win a lot wouldn't you?". Tasha responded confidently and quickly, "I only won twice. Nothing big". Tasha did not convey as much confidence in most other answers. What might speak to this is the active nature of racing (and possibly the outcomes) and relevance to her. Psychological research has found action, repetition, novelty and relevance to the individual were all important to memory creation (in K. Liddicoat & Krasny, 2013) . In a study of long-term memories, a year after a residential environmental education program the authors found that "recollections were highly influenced by actions taken by the students" (Knapp & Benton, 2006). For Tasha, who did not have an apparent connection to the natural world, her interactions with others may have been the most relevant experience.

In a description of how Tasha's daily life changed after the residential experience, she shared her perspective on how she saw a change in herself and her identity.

> Like not getting into trouble....like they told me around October that I was going to be going.....so then if I was to have an incident, we call them strikes, I wouldn't be able to go. So I had to be the whole time waiting for *the residential experience*

> to come.....but I'm good now though, because I'm used to it, because it was such a long period from October through Yellowstone.

Tasha gave credit to the residential experience for realizing her ability to be "good" and to continue to stay out of trouble for 15 months after the experience. In sharing these results, I am not applying a deficit model to Tasha, but recognizing the changes she subscribed to herself. She explained that because she had to be incident or strike free for 10 months prior to the residential experience, she became 'used to it' and now it was part of who she is.

Did this identity shift change Tasha's connection to the natural world? It appears that her concept of the environment, as something outside the city where animals, which she fears, live did not change after the residential experience. After going through her pictures from a week in the National Park (19 out of 50 were of friends and chaperones), I asked if any of the pictures relate to her life now. She said the pictures of friends were relevant, but the others pictures were not because she was a ‘city girl’. During the interview, she said she enjoyed seeing a specific geologic feature and taking pictures of it and other aspects of the natural world, but she also labeled non-city things as "nothing". The picture she is referring to in this quote below is of a landscape.

> Like the friends ones do but I don't go out much like that much to the woods...more like the city type. If I would go to the woods I would take pictures because I love taking pictures of nothing...stuff like this.

When Tasha was asked directly if her connection to the natural world or environment changed after the experience, she appeared to be looking for what she believed was the "right answer", within the information she learned during the residential program. Her response likely was influenced by a school framework, where questions are often focused on cognitive understanding. The question was trying to understand how she felt connected to the

environment, and her search for a cognitive response may speak to the lack of emotional connection.

> The nature, nature (to herself)....like about littering and how bad that would be for the animals....leave no trace.

It appears Tasha came to the residential experience without a connection to the natural world, and while she was in the National Park, she focused on what was most relevant to her, other participants. Thus, her connection to the environment did not seem to change.

Many environmental educators creating curriculum have a strong connection with animals and the living world. Thus, these programs are created under the assumption that all who participate in them will enjoy seeing, being near, and learning about animals. However, many urban youth like Tasha lack experience being around wildlife and also lack the positive adult messaging about wildlife necessary to increase comfort and decrease fear (Van Velsor & Nilon, 2006). This disconnect contributed to Tasha's lack of interest in the wildlife and appeared to not lesson her fear of animals. In a study of fears of urban youth in wild lands, the author found that fear of animals was one of the most common fears expressed. It was also noted that is what may account for the 'indifference' to natural areas by urban youth (R. D. C. C. L. Bixler, 1994).

> For various reasons, people grow up with different attitudes toward natural areas: Some enjoy wildlands, some are indifferent, and others are even phobic...One plausible explanation for this lack of interest is the inability to feel comfortable and confident in these unfamiliar places. (Bixler, 1994)

Thus for Tasha, the animals in the National Park that attract people from all over the world and make the place special for many, did not enhance her experience. Her case highlights

a potential blind-spot of many environmental educators, which is all youth will love experiencing the outdoors and animals the same way they do. Prior research shows the need for positive exposure and social support for that connection to happen. The social relationship practices, however, did make the program relevant, fun and memorable for Tasha and also played a part in her identity change.

Synthesis

For all three of the participants, the residential environmental education experience allowed them to either recognize their own abilities or potential future occupations thus facilitating identity changes (shifts). All identity changes were attributed to the residential program by the participants. One of the three shifts was directly tied to the natural environment. This reveals that some important consequences (outcomes) of residential program may be overlooked if we do not allow for evaluation processes that hear the voices of the participants and recognize the other agendas that are pursued in these contexts. This allows them to express what was important, memorable or transformative to them.

Adam's identity shift and new potential career choice persisted over a year and a half after he was at the residential program. He came to the program with a strong connection to the natural world because of his love and knowledge of animals. His engagement with the Park during the program was as an "insider" or someone who identified with place (Lim & Barton, 2010). The Contextual Model of Learning in informal settings posits that there is a "never-ending dialogue between the individual and his or her physical and sociocultural environment" (J. H. Falk & Dierking, 2000). It appears during the residential program, Adam's place identity and environmental identity reinforced one another and helped create a new identity, in the form of potential career as a naturalist.

For Emilia and Tasha, their identity changes may not have been associated with the natural environment, but the changes would be considered significant as they were positive youth development (PYD), which is the goal of the community youth organization in which they belong. The fundamental goal of community youth programs is to provide a positive social environment for an adolescent to gain personal and social assets to facilitate development into functional, contributing adults (Eccles, 2002). The programs are often developed in communities where there are a plethora of negative influences and where youth experience racism, sexism, classism, homophobia and other barriers. These programs allow for an alternate space where assets can be acquired that allow youth to navigate these negative influences (Sutton, Kemp, Gutierrez, & Saegert, 2006). The model community youth organizations use to attain their goals is providing safe social settings which allow adolescents to develop positive personal and social assets. Some of the assets important for PYD include; good physical health habits, critical thinking, positive mental health, conflict resolution skills, connectedness, ability to navigate multicultural context, and civic engagement (Eccles, 2002). Not all assets are required for PYD, but the more a child has, the more resilient they will be to fend off negative influences or get through negative situations (Eccles, 2002).

For Emilia, she gives credit to the social space created during the residential program in gaining social skills and ability to "make friends". For Tasha, the requirement of the residential program to stay out of trouble before the trip reinforced her abilities. Since both of these participants arrived without feeling a connection to the natural world, is it realistic to expect an identity change for them that involves the natural world? The learning environment of the residential program did provide the "safe social setting" necessary for social repositioning and relationship development to occur for Tasha and Emilia. Future studies should focus on how to

discern if all participants experience the same safe setting to allow social growth and development.

Changes in Stewardship

The ultimate goal of environmental education is to create informed, active stewards of the natural world. In this study, stewardship is defined as an individual's desire to take action or action taken to protect the natural environment. The natural environment is considered as non-human constructed (but often highly manipulated) areas. The stakeholder's goals of this residential environmental education program included encouraging stewardship, creating a desire to protect the National Park, and to create the future environmental leaders (see Table 2 in Chapter 2). During the interviews of the first year cohort, the questions asked of the participants connection to the natural world before and after the environmental program did not reveal a sense of stewardship. Participants instead described how often they played outside and what activities they participated in.

Thus, questions were added about protection of plants and animals, some of which they learned about during the residential experience. This approach was an attempt to try and understand if a residential program message was being translated into a desire to protect the biota, living organisms, inside or outside of the National Park.

Besides Adam's dream about becoming a naturalist to learn about and protect animals and become a steward of the natural world, only two other participants discussed a stewardship desire. Matthew repeated several times throughout his interview how he wanted to save both "his planet and Yellowstone". He further explained that he wanted to keep the park the way it is, and always was, so it would be around for others to experience and enjoy. Lori also mentions a

new connection to the environment and desire to protect the park. Of the seven participants who were asked about the importance of protecting specific plants and animals, Lori was the only one who believed all should be protected.

The curricular focus of this program was on understanding the ecology, geology, and natural history of the National Park. The stewardship message was a combination of the natural science understanding of the park, along with seeing and experiencing the animals who made the park their home, and a culminating project where participants had to argue why the park should be saved. The hope was this would lead to program participants bonding with and wanting to protect the park. Many participants bonded with the park, others bonded with the experience, and for three participants, Adam, Matthew and Lori that lead to a desire for stewardship.

Matthew: Wants to Save the Planet and the Park

Matthew is an African American male who enjoys learning. He came to the program with much knowledge about animals, as he had read many books about them and he also had a strong interest in science. He had some experience being in natural settings, as he frequently visited a park near his home. During the residential program, he was often asking and answering naturalist questions. He was also one of the few consistently interacting with the natural world, and thus would be considered in the 'engaged stance' described earlier.

In the post-experience interview, Matthew made it clear that he enjoyed learning and the experience made him want to save the National Park and the planet. In the first question, when asked about his experience, he explained:

> So, it was good because I got to learn, like, about nature. And I learned about— I saw more animals. Like I saw what like what we were supposed to like— because you know there is pollution and stuff. So I want to like save my planet and Yellowstone because I want to keep it like that because it's really cool and like there is a lot of really cool things there.

I suggest that Matthew is trying to explain that what he learned about and what he saw in the National park made him want to protect the park and his planet. The concluding project of the residential program involved participants using one of the fifty pictures they captured that week to argue to save the park. In his follow-up interview, he continues to want to protect the park, but it is unclear how that notion expands to protecting the planet. Matthew believed his family would say that was how he had changed since he returned, "Well, I learned to respect nature and not destroy it. That's all."

When asked about Matthew's connection to the environment before the residential experience, Matthew explained his motive for visiting his local park was to see animals. To understand his desire to take part in stewardship of the natural world, he was asked if he has done anything related to the residential program since his return, he notes:

> I wouldn't say like always. But sometimes. Because I want to respect nature and I just want to keep the world— make the world a better place. And like not try to kill anything because if this was gone, I would never have seen it and it would have been taken over— there would have been cities and streets everywhere.

In describing how he would steward, Matthew states in the abstract how he wants to respect nature and make the world a better place. He then brings his statement back to the final project of the program, arguing for the protection of the park from development in order to protect the animals that live there. It is suggested that Matthew's strong animal connection made the message of the culminating experience more powerful.

Matthew had difficulty defining his favorite experience, whereas for many others it was a specific animal or geologic feature. In his statement below, you can understand his appreciation of learning and that he saw the experience as a once in a lifetime opportunity.

> Well, it like— like I don't want it— I don't know. I can't explain it. Like I just really, really liked it because it was a great experience because I got to learn more about nature and just got— and I got to learn new things. And I think if someone

> else could have the chance, they would be lucky because they might not have it again.

Matthew recognized the park for what it was, a vestige of wilderness in this country. His message to the next participants was "cherish" this unique experience, and that it had the potential to make them better people.

> Well, I will tell them, well, this will be a really great experience, you should cherish it for the rest of your life. And you should never let go of this memory because it might be there for once in a life. So always keep it in mind and cherish nature because Yellowstone has always been like this and you want it to stay like this.

> I would tell them — I hope Yellowstone made you a better person because they teach you a lot about life and what you should do to stop things in the world. And make a change

Matthew arrived with a strong connection to the environment because of his love of animals, learning and science. Nine months after the residential experience, Matthew expressed his desire to "make a change" in the world to save the planet and the park. The experience also led to a change in his level of interaction with the natural world. After the program, Matthew said he spent more time outdoors playing sports, playing in his yard, and observing plants and animals.

It is interesting to note that when Matthew was asked to determine if eight animals and plants were important, somewhat, or not important to protect, he labeled the things that he learned about in the National Park and those he had knowledge of, as important to protect. Plants or animals that he did know were put into a category of somewhat important to protect.

Mathew came away from the residential program with a desire to take action and protect Yellowstone and his planet. He saw the park as how the natural world 'used to be' and did not want it to go away. However, it does not appear Matthew was taught what actions he could take to protect the environmental once he returned home.

Lori: Wants to Stop Development

Lori, a Caucasian female, arrived with little prior knowledge and some experience in natural places, such as visiting neighborhood parks. She described her connection to the natural world, prior to the residential experience, as enjoying playing outside in her yard when the weather was nice. When asked if her family would say something has changed about her she described the newfound stewardship desire.

> Probably. I mean, I feel like I am more— I don't know what the word is, but like I feel more like the environment is way more important after I went to Yellowstone. And like that whole thing we had to do at the end, like why should we not turn Yellowstone into a really big parking lot, and stuff like that— and that made me think— and it's like, well, a lot of things happen like that. And I need to help stop things like that. Or just do the little that I can.

Unlike Matthew, Lori did not repeat the stewardship desire throughout the interview. However, she was the only participant who took part in the questions about plant and animal protection, who said it is important to protect all animals and plants listed in the post experience interview. Her arguments for protection ranged from the organisms beauty, numbers (rare), and ecological function. She also said her level of interaction with the natural world changed since the program as she spends more time hiking and outdoors and observing plants and animals. These new or more frequent interactions with the natural world are important new social practices derived from the residential program. Ones that can serve to provide more experiences and reinforce and build connections to the natural world now and in the future.

Synthesis

Stewardship is one of the main outcome goals of most environmental education programs, including this one. However, only three out of fourteen (including Adam) participants

expressed an explicit desire to steward the environment after their residential experience. A possible explanation, found in earlier research, could be the residential program's curricular focus. In a study of high school students' memories five years after two different residential environmental education experiences, the data showed participants of the program in which "learning conservation behaviors is a more explicit part of the program" more often credited the program for inspiring "environmentally responsible behavior" (Liddicoat, 2013). The author also noted that the behaviors expressed did not tie to conservation of the semi-natural area where the residential program took place, the North Cascades. Instead, stewardship behaviors reflected what was taught during the program that could be continued at home. The second program in the study, the Teton Science School had more of a science curricular focus, and few participants discussed stewardship activities inspired from the residential environmental education experience (K. R. Liddicoat, 2013). These results are consistent with what was observed in this study.

The curricular focus of this residential program was ecology, geology, and natural history of the National Park, with the overarching theme of preserving the park. The findings of Liddicoat (2013) and the results of this study suggest the importance of having explicit conservation behaviors as part of the curriculum or experience if there is a desire for participants to continue environmental stewardship behaviors when they return home.

Becoming an environmental steward is a long term developmental process and most of these participants were early on in the experiential practice necessary to be stewards. None of the participant expressed having stewardship experience prior to the residential program. It is unrealistic to expect youth at this age to know how to be stewards without mentorship. I believe this is evidenced by Matthew's repeated desire to "make a difference" without being able to

explain how beyond "not wanting to kill things". Lori's expression of wanting "to make a difference" started with trying to help stop development of natural spaces (the theme of the program) and concluded with "or just do the little that I can".

To try and understand why pro-environmental behaviors occur, Kollmus and Agyman (2002) reviewed the many models that exist to explain why or why not individuals participate in environmental stewardship. The authors created their own model describing necessary internal and external factors and barriers. Without the necessary antecedents to environmental stewardship, such as the internal factors which create environmental consciousness (knowledge, feelings, values and attitudes) and external social, cultural, political and economic factors, we cannot expect stewardship behavior to spontaneously occur (Kollmuss & Agyeman, 2002). The authors' model also accounts for barriers to stewardship such as lack of the internal and external factors, and lacks of incentives, feedback, and old behaviors.

This residential environmental education experience allowed for some individuals to express a desire to be stewards when they returned home by affecting internal factors, such as values and feelings. However, when the youth return external (social, economic, political, or geographic) factors, can become barriers to their desire to become stewards. A large barrier that arises upon the participants return from this program is distance. The participants are separated by nearly a thousand miles from the National Park they want to protect. Thus if environmental stewardship is an outcome goal of a residential environmental program, providing resources and tools for continued stewardship once the participants return home would be essential.

Perception Changes and No Change in Environmental Connection

For the remaining participants who took part in post-experience interviews, there was either a change in perceptions, beliefs, and no change in interest, identity, and stewardship of the natural world. For Samantha, Nereus and Ursula, after the residential experience, they saw the natural world differently. Three participants did not change their environmental connection as defined in this study. Of the three that did not change their environmental connection, only one did not have a connection to the environment prior to the residential program.

Perception change

Samantha explained that she always enjoyed being out side, but the experience changed her connection "because now I think about the differences in so many different places...". The difference she described throughout her interview was the peacefulness that the National Park seemed to offer that was not found in her urban environment.

Nereus, prior to going on the residential experience, said he generally "liked" nature as was evidenced by his desire to play outside. He saw the experience as a "fun adventure" and he was "happy" that he was able to go and see amazing things. What changed for Nereus as a result of his residential experience was his perception of the natural world. He noted he “noticed it more” and in general he "likes nature way more". Thus an outcome of this residential program was Nereus' increased ability to perceive the natural world around him.

> Like I pay attention more to my surroundings. Like stuff that I see now, like, oh there is a bird. I used to be like, oh, bird. And I just like seeing birds.

Ursula reported no connection to the natural world before the residential experience and was primarily focused on social interactions during the experience. Ursula noted that she developed an empathy for the animals and a belief that hunting was wrong from the experience.

> Well, I really don't think hunting is right after seeing all the animals and just them living doing whatever— just roam free. I actually thought it was pretty cool that they got to do that and stuff. Because I know if I was an animal I wouldn't want to be kept up in a little zoo, so it was actually really cool.

These changes in perception after the residential program are important and could serve as an initial step toward connecting with the natural world. Future research should focus on understanding what aspects of the program facilitated these perception changes, along with the other changes that occurred.

No change in environmental connection

The following individuals did not have a change in their environmental connection, defined in this study as interest, identity, or stewardship, after this residential program. They were also self-described as unchanged in their connection to the environment after the residential experience. For one participant she came to the experience with a strong environmental connection and another without any, these connections persisted after the residential experience. Therefore, there was no change in environmental connection as a result of the program.

Tammy and Melissa had a strong social focus during their residential experience. Tammy had very little time in the outdoors playing prior to the residential experience, except during summer camps. Tammy noted in her post-experience interviews that she did not have an environmental connection. However, in a statement that appears inconsistent with what was reported, Tammy noted that her feelings about nature or the environment had not changed after the experience as she stated "I still care about it (the environment) a lot, but I don't care about it anymore than I do now than I did then". It is unclear why this contradiction exists. Regardless,

Tammy explains her feelings for the environment were unchanged as a result of the residential experience.

Melissa had more experience in natural places than most other participants in the program. Most of the participants reported their outdoor experiences as playing in their yards. However, Melissa also hiked and observed plants and animals with grandparents and at a local creek, observed wildlife in a desert area where her dad lived, and had camping experiences with her mother. Thus, Melissa came to the residential program with the understanding that the natural world is a "fun" place where you get to "learn". Melissa came to the residential program with many positive experiences with nature, however, she noted her feelings did not change as she has always "loved the outdoors".

Levi's connection to the environment was expressed primarily as playing sports outside and walking his dogs in the park. When asked about if his feelings towards the natural world or the environment had changed after the experience, he described his efforts to rescue stray dogs. Levi's was unique in that he was a last minute addition to the trip, and did not take part in pre-trip experiences. Another confounding factor during Levi's interview was the presence of his grandmother and siblings. This may have influenced what information he was willing to share during the post-experience interview. His self-described connection to the natural world centered around dogs, and continued after the residential program.

It is important to recognize for some individuals their connection to the environment did not change after this formidable experience. None of these participants arrived with an identity tied to the natural world or stewardship, however many enjoyed playing in the outdoors. Why did the residential experience facilitate interest, identity or stewardship changes for some who did not arrive at the program with environmental connection and not others? Future research

should focus on what aspect of the individual's context or the residential program prevented or created these changes. Specifically, can outdoor play serve as a learning pathway for youth to engage with the natural world and increase their connection and stewardship desires?

Revisiting the Residential Experience

Having follow up experiences related to a residential environmental education program has been shown to increase the programmatic effect (Smith-Sebasto & Cavern, 2009). Smith-Sebasto & Cavern (2009) researched the impact of a two-day residential program on participants who took part in pre- or post-activities and the program or the residential program alone. They reported the only significant increase was in respect for the environment and only for those who participated in both the pre- and post-trip activities and the residential program.

For this study's residential experience, there were several pre-trip events, but no post-experience activities. Without post-experience follow up, the participants' memories could serve to reinforce what they learned and gained from the experience. Thus, participants were asked several questions trying to understand how often participants revisited the experience on their own, with others, and what triggered those thoughts or conversations.

A majority of the participants said they thought about the experience "a lot" even 9-19 months after the experience, which was described as weekly, monthly, and to a few times a month. The triggers for thinking about the experience fell into the following categories; animals, park features, school, other club participants, memorabilia, and other. All triggers described are in table 2 below.

Table 5

Triggers for Participants toThink about Their Residential Environmental Education Experience

Animals	Club Connection	School	Park Features	Memorabilia	Other
Wildlife in backyard	Friends who went	Social Studies Class	Mountains	T-shirts	Color Red
Cats and dogs	Members going	Science Class	Trees	Pictures	(Moon)
Animals at Zoo		Science Teacher	Clouds	Movies of Wolves	College Chant
Animals on TV			Cabins		
Bears			Other Camps		
Bison			Geysers		
Wolves					

Observation of animals in Yellowstone was one of the main objectives of the program and some of the participants had a strong connection to animals. Therefore, it is not surprising that animals were triggers to revisit the residential experience for many of the participants. The animals that served as triggers were those seen in Yellowstone, wildlife in the city or on television, and domesticated pets. During one of the two years this study spanned, the instructor gave a lecture on how closely related dogs were to wolves, which may have facilitated the tie to domestic animals. The park features, such as mountains and trees, also reconnected participants to the experience as did memorabilia they were given or purchased themselves.

For all participants, one picture was printed for them and it was used to argue for the protection of Yellowstone. The other pictures were put on a jump drive for them to take home. A majority of those interviewed did not print out the remaining pictures. However, some participants had uploaded the photos to their Facebook pages, made calendars with them, or were put on a computer. The creation of these artifacts was important, as the few participants who made their pictures readily available via the artifacts, were the ones that used the photos to revisit

the experience. By revisiting the event with these items participants were reinforcing the learning pathways created during the residential program.

Sharing memories can also be a social experience which reinforces the residential program, expands meaning and serves to develop identities tied to the experience. Most participants interviewed said they talked to their friends and family about the experience less frequently than they thought about the experience. Two participants only spoke to fellow club members about the experience, Matthew and Tammy. Matthew explained his reasoning was "....because they experienced it and I don't think anyone else would get it except us". Tammy explained that she only had talked to her mom about the experience when she returned, but did not elaborate on why discussions are now limited to club members.

Research has found that memories of residential environmental education experiences as much as five years later, served directive (how to be), social (point of discussion), and self (identity formation) functions (K. R. Liddicoat, 2013). In this investigation, similar categorization could be used for changes participants experienced (and often continued) 9-19 months after the program ended. New interests, such as camping, fishing and hiking, were pursued by some participants and served a directive function. The experience was discussed with friends, family, teachers and other participants serving a social function. Also, some participants identities and stewardship desires were shifted, serving a self function. Thus it is possible these post-programs changes and the memories from the residential experience could continue to serve these functions long after the experience ends.

School and Science

For some of the participants, school served as place to revisit what they learned during the residential program. Ecology, geology and natural history are the main curricular foci, and

several participants spoke of using the knowledge from the program in their science courses. Eight participants expressed a love of science or noted it was their favorite subject prior to the residential program. The other six participants were equivocal about it or disliked the subject. The residential experience increased the participants' affinity or understanding of science for all except four participants. Two of the four that experienced no change in affinity claimed they already liked the subject matter a lot before the residential program. For some participants, they attributed their change in what they felt about science to the residential program, for others the origin of the change is unclear. Below is a table of pre and post residential program connection to science.

Table 6

Participants Self Described Connection to Science in School

Pre-Program				**Post-Program**		
Love/Favorite	**Like**	**Equivocal**	**None**	**Change due to REE**	**Change**	**No Change**
Adam	Levi	Marco	Adela	Adam	Tammy	Samantha
Nereus	Tasha	Melissa	Emilia	Nereus	Melissa	Matthew
Matthew	Ursula		Tammy	Ursula	Adela	Ed
	Lori		Ed	Marco	Levi	Tasha
	Samantha			Lori	Emilia	

The science curriculum for the sixth and seventh grades in the state where the participants lived included animals and ecology. Several participants discussed sharing their knowledge from the summer residential experience with their science classes or teachers. The two participants who had a strong connection to the discipline used and shared their new knowledge with their science teachers. One participant noted that his parents said he had become "more

sciency" after he returned from the residential experience. He argued that he always loved science, and came away from the residential program loving it even more. He was also able to use his knowledge in the next year's science class..

> Science was always one of my favorite subjects, especially if it has to do with animals. And then after I went to Yellowstone I got to read all these animal books. I went on this big, crazy investigation to find out what this certain mouse was that me and my cabin mates had such an interest with.
>
> -Adam

> Oh, we learned a lot about animals in this. And about food chains and things. And I had a science project like at the beginning of the school year to make— it was a food web. And so some of the stuff, I already knew where to put things. And I still want to learn a lot about animals..
>
> -Adam

Nereus shared some of his pictures from Yellowstone with his science teacher and was able to use his knowledge in science class discussions. This increased knowledge appears to influence his like of the science discipline.

> Because that was the summer and like a month after we had the science group and we were talking about nature. And I talked about like how— what like nature looks like and what happened in nature. Yeah. I got more knowledge about the nature. I got more knowledge about nature.
>
> -Nereus

Other participants spoke of applying their knowledge gained from the residential program in school, specifically in science classes. For some, it was the expanded understanding of science and active learning they experienced during the residential program that engaged them more in science. This translated into an increased interest in the discipline.

> Well, I learned a little bit about it in my school because we had to learn about, like, I forgot what it’s called, but there is like consumers, decomposer... and I learned about animals.
>
> -Matthew

> And I remember once in the beginning of the school year my science teacher was talking and he said something and I brought up something about Yellowstone. And it felt good doing that. I just loved it.
>
> -Lori

> It actually did because science was really boring because you never got to experience like the stuff they talk about for yourself. So actually going to Yellowstone and knowing what they are talking about and it making sense actually helped a lot.
>
> -Ursula

> Like I thought it was like— like I never really knew about it that much. I thought it was just like— I didn't know like outdoors and stuff was like science. I thought it was just like atoms and things and never knew that that was science.
>
> -Marco

One participant noted her change was due to her teacher. For the remainder of the participants, it is unclear why the changes occurred. There description of the changes in their connection to the science discipline is below.

> Yes, but it was because of a great teacher, not Yellowstone.
>
> -Tammy

> I like science more. I g**e**t A+ in science.
>
> -Emilia

> It got easier in some ways.
>
> -Levi

> Now I like science. Like it's fun.
>
> -Melissa

Science classes served as a way for the participants to share the knowledge gained during the experience revisit the experience, and gain more of a connection to science. The National Research Council (NRC) reported on research in learning science in the informal setting and found that identity and interest were important strands of learning science especially for individuals from populations underrepresented in the sciences (Bell, et al., 2009). The NRC states that informal settings

> often serve as an 'on ramp' to help the learner build familiarity with the natural and designed world and to establish the experience base, motivation, and knowledge that fuel and inform later science learning experiences.

(Bell, 2009 p. 295)

This residential experience appeared to serve to increase several participants' knowledge and interest in science. The science classes in the schools' curriculum served as a place to revisit and reinforce their residential environmental education experience.

Conclusion

This investigation revealed that there were changes to some participants' interests, identities, and desires to be stewards of the natural world after this residential environmental education program. This contributes to earlier research on how these specific variables affected participants' residential environmental education experience (Chapter 2). Recognizing residential programs and their unique, immersive qualities as a socio-cultural phenomenon where identities and interests are being shaped by social, environmental, and academic interactions, allows for an understanding of outcomes (or changes) not previously described in residential environmental education programs.

Interests can serve directive functions for participants during a residential program. This study found interests created during at residential program were pursued by some participants as new ways to interact with the natural world after they returned home. These results support research in long-term memories of a two-day residential program, which found that the novelty of the residential experience was engaging, but what helped reinforce the experience over many years was the participants ability to take what they learned and apply it to "their backyards" (K. R. Liddicoat, 2013). It should be noted, for several participants of this study, continued and new interactions with the natural environment required facilitation by family members. These

findings also support a body of research on learning processes of youth, which finds that youth need adult, social support and facilitation of their interests (Banks, et al., 2007; Barron, 2006).

Prior research has shown that individuals' interest and identity affect how participants interact with informal settings and the natural world (Bell, et al., 2009; John H. Falk, et al., 2008). It should be noted that identity is understood differently by these researchers. Falk et al. (2008) approach identity as a stable role individuals bring to the learning environment, while Bell et al. (2009) see identity as dynamic and tied to individuals participation and social interactions.

To date, there has not been an empirical understanding of how the unique setting of a residential environmental education program affects changes in identity. This study demonstrated that identity shifts occurred for participants in their connection to the environment and also in their social identities. A participant who arrived with identities tied to animals and science, interactions with the National Park only reinforced those identities and created a potential shift in his future career interests. For two others who did not have identities tied to the natural environment, they saw changes in their social identities. These findings reinforce previous research which found the social aspects of a residential programs were important to participants (J. J. James & Bixler, 2008; Smith-Sebasto & Walker, 2005). The findings of the current study revealed that the social aspect of a residential environmental education experience can lead to long-term outcomes in identity change. It also leads to potential future design-based research studies which try and discern what program structures create a safe environment for participants to pursue new interests or identities.

Multiple internal and external factors influence an individual's pro-environment or stewardship behaviors (Kollmuss & Agyeman, 2002). Thus, a singular residential environmental

education program can serve to affect participants (internal factors), such as feelings, attitudes or valuation of stewardship. Youth need mentorship and direction on how to translate that desire into action. Previous research has found that a residential program curriculum focused on conservation practices elicited pro-environmental behaviors five years after a residential experience, something not found in a similar residential program with a science focus (K. R. Liddicoat, 2013). Thus, future residential programs could help facilitate stewardship behaviors by providing youth with actions they can participate in at home as part of the curriculum. This would help to make visible the stewardship actions that participants may not have known about. This could also help create and encourage a sense of agency, something found in environmental leaders (Blanchet-Cohen, 2010; Chawla & Cushing, 2007). Aligning these stewardship actions with participants social practices also has the potential to have a synergistic effect.

The post-experience interviews were from 9 to 19-months after the residential program in order to understand changes that were not ephemeral. It is recognized that, these interviews are singular events, and memories can fade and change. However, recent research on episodic memories as a way to understand outcomes of residential programs found that individuals retained and reflected on their residential programs as long as 47 years post-experience (K. R. Liddicoat, 2013).

Thus memories can give important insight into outcomes of residential environmental education experiences and serve to reinforce those outcomes (Knapp & Benton, 2006; K. R. Liddicoat, 2013). Therefore, understanding the triggers for revisiting the experience is also important. Due to the unique feature of this residential program, being in a different state then where the participants live, understanding what triggered participants to think and talk about the experience after leaving the program could increase the impact. This is the first empirical

understanding of what triggered participants revisiting of a residential environmental education experience and thus what reinforced their memories. Memories were triggered by physical items, such as animals and natural features of the park, and social interactions with others. The revisiting of memories has the potential to increase or continue the impact of the residential program. Thus future residential or environmental education programs could evaluate what leads to participants revisiting the experience and design it within the program. For example, in this program, talking with other club members who have or will be going could be reinforced with annual reunions of all former participants. These program designs could allow for continued reinforcement of new social practices developed during the residential program, potentially providing increased connection to the natural world.

From an ecology of learning perspective, there is a desire to understand the influence informal learning environments on how it "prepares a learner to participate in other settings" (Bell, et al., 2009). In this investigation, the residential experience helped prepare students for their science class the next year. The knowledge gained during the residential experience was shared with teachers and for some the residential program increased their interest in the science discipline.

Barron (2006) makes the proposition that learning effectiveness should "measure how often students found ways to continue learning" after an experience. Future design based research on residential programs should try and discern what the program can provide curricular or structurally that facilitates participants pursuing new found interests, identities, or desires to be stewards.

This study revealed the potential for using the two strands of learning important in informal settings, interest and identity, along with stewardship to understand the long-term effect

of this residential environmental education experience. Admittedly, a change in a desire to be a steward of the natural world, is a change in both the participants interest and identity. However it was treated as a separate category in this study, both because it a specific kind of interest and identity change, and one that is an outcome goal of this an many other environmental programs.

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Chapter 4

Participants Cultures and Lived Realities in the Context of a Residential Environmental Education Program

Introduction

Lewis and James (1995) called for an increase of inclusion of diverse voices in environmental education, which historically has been dominated by the White, middle-class. The authors argued that there are multiple misconceptions in environmental education, including a belief in a universal appeal of environmental education programs and subject matter. The authors recommend tailoring environmental education programs to meet the needs of the audience. Nearly twenty years ago, these researchers were making visible the pervasiveness of the dominant cultural norms in environmental education and arguing for the need to recognize and adapt programs for the inclusion of other cultures.

Understanding the role culture plays on people's connection to the natural world, to date could still be considered an emerging phenomenon within environmental education. In the recently published *International Handbook of Research on Environmental Education* the authors acknowledged that culture affects how people experience and relate to the natural world.

> The authors have raised such questions as how culture mediates the development of a relationship with the land and sense of place and inscribes our embodied experiences.
>
> Stevenson et al. (2013, p. 515)

An empirical example of how culture affects individual understanding of the natural world comes from Bang et al. (2007). In a study of how individuals from two rural populations

and an urban population understood and interacted with nature, the authors found a difference between the rural Menominee children, rural European American children, and urban children. The study found that the ecological reasoning was common even among the youngest Menominee children, but it was not found in rural European Americans or urban children. That meant the Menominee children saw humans and themselves as part of the ecological structure, while the other children saw humans above ecology and more than just animals. The authors noted "both culture and experience affect children's anthropocentrism and propensity for ecological reasoning" (Bang, Medin, & Atran, 2007).

Because environmental education has been dominated by White, middle class culture and yet there are multiple cultural and experiential ways of understanding the natural world, there is a need for the recognition of differing cultures. Zeyer and Kelsy (2013) argued that a "clash exists between students' life-world culture and the culture of environmental education.." and thus environmental education needed to recognize those differences to be successful. The authors suggest that environmental educators should be seen as a 'cultural brokers', where

> ...teacher attempts to understand the life world cultures of his or her students, and to effect change by bridging, enlinking, or mediating between those cultures and the dominant culture of environmental education.
>
> (Zeyer & Kelsey, 2013, p. 211)

Acknowledging the need to recognize the cultural aspects of environmental education experiences and how it interacts with the "student's life" (or what I refer to as lived reality), this chapter addresses the following research question:

> How does the recognition or lack of acknowledgment of participants cultures and lived realities affect their residential environmental education experience?

This research fills a void in the empirical understanding of the intersection of the residential environmental education experiences with participants cultures and lived realities.

Theoretical Framework

Recognizing the multiple cultural ways of knowing and experiencing the natural world is important. It is also important to recognize that residential environmental education experiences create a "figured world" which are "peopled by the figures, characters, and types who carry out its tasks and who also have styles of interacting within, distinguishable perspectives on, and orientations toward it" (Holland, et al., 1998). The individuals participating in residential programs will interact with the 'figured world' depending on their own social and cultural realities.

> ...one's social position-defined by gender, race, class, and any other division that is structurally significant-potentially affects one's perspective on cultural institutions and the ardor of one's subscription to the values and interpretations that are promoted in rituals and other socially produced cultural forms (Holland, et al., 1998, p. 25)

Thus the incorporation or recognition of the students lived realities has the potential to make environmental education experiences more relevant and empowering for all students, especially those from marginalized populations (Bell, et al., 2009). A recent study found that student's lived realities were not recognized during environmental education experiences. In an ethnographic study of two student groups with an environmental focus, it was found that “the prevailing narratives of oppression and privilege permeate environmental education” (Tzou, et al., 2010, p. 117).

Tzou et al. (2010) found certain narratives within environmental education settings obscured some participants lived realities. For example, during a residential environmental education program youth were told by one of the leaders that people need to stop their addiction to driving and "the earth would be so much better off" if everyone walked everywhere. The group he made this declaration to live in a neighborhood where drive by shootings happen and during the time of the study, a youth on a bike had had a gun pulled on him. Within the same residential program, two young female participants expressed their fear of a night walk and not being able to lock their bedroom doors. The researcher learned that both girls arrived at the residential program with a fear of "being taken" (Tzou, et al., 2010). Thus specific aspects of the residential program, no locks on doors and night walks, facilitated the fears they brought with them. These disparities in realities cannot be reconciled if they are not recognized and attended to meaningfully. Thus this study attempts to understand and make visible the consequences of discrepancies in the context of residential program and the culture and lived realities of the participants.

Research Design: Methods, Data and Analysis

Historically homogenous research methodologies within environmental education has served to keep out voices beyond those of the dominant culture (Agyeman, 2003; Carleton-Hug & Hug, 2010; K. James, 2003). Thus more culturally congruent research methods have been called for within environmental education (Agyeman, 2003; K. James, 2003).

This ethnographic case study attempted to create a space for the voice of the underrepresented using multiple methods to understand how students cultures and lived realities interacted with a residential environmental education program. Data were collected over two

years of participating in this annual program. A variety of ethnographic, qualitative research techniques were used including: participant observation, volunteer video diaries, analysis of student artifacts, and post experience semi-structured interviews.

Data consisted of approximately 150 hours of participant-observation which includes pre-trip events and the 5-day residential program over two years. Artifacts were also collected which included thank you cards, photos taken by participants and video journals. Seven participants from each year's cohort were interviewed 9-19 months after the residential program. Video journals and interviews were all transcribed and thank you cards and pictures were reviewed and categorized.

Participant observation notes and the transcribed journals and interviews were all coded and recoded as an iterative process. The coded work was distilled into themes or constructs via rereading data and looking for recurring concepts or ideas, and finding within the data support for the themes (DeWalt & DeWalt, 2002). As themes developed, new data were compared to those themes. Analytical memos were created from the coded material describing how patterns fit together, while continuing to look within the data for inconsistencies (Merriam, 1998). This process allowed for a refining of categories or themes into key concepts and integration or development of less developed constructs, eventually creating a relational understanding of constructs to each other and students residential environmental education experience (Fetterman, 2010). A “constant validity check” occurred during analysis which involved looking for consistencies among students, checking between what was observed and what students said, examining evidence that does not support conclusions, and developing alternative explanations (DeWalt & DeWalt, 2002). To facilitate the identification of patterns and the creation of themes

database software, NVivo, was used for data management and analysis. The software was used for coding, retrieving, reviewing, and managing data (Fetterman, 2010).

The Residential National Park Program:

This five-day and four-night residential environmental education program occurred in a National Park located in a different state then where the participants lived. All of the participants attended a regional community youth organization situated in a medium sized city in the Pacific Northwest. The community youth organization clubs are also located outside of the city and extend into the suburbs and more rural, residential settings. Annually, twenty-one children were chosen by staff members of the organization to be flown to Yellowstone and attend the program. Four field trips occurred prior to the residential environmental education experience, which focused on: showing the participants how to observe animals safely; team building; hiking and plant observation. These meetings also served as a time for the families, chaperones and instructors to meet, get an overview of the program, answer questions and alleviate fears.

The five-year old program is a partnership created by donors who sought to provide a residential environmental education experience for youth not likely to visit this National Park. Other stakeholders, besides the community youth organization, included a non-profit organization which provided the curriculum, transportation and accommodations at the park. The National Park staff provided the culminating experience of the participants earning and receiving their junior ranger badge.

Chaperones consisted of five staff from the community youth organization and myself. One staff person was in charge of organizing the logistics, the others helped with pre-field trips and supervising the youth during the trip. In the first year of this study a new staff person took

charge of the program right before the residential environmental education experience. There was also a change over in chaperones each year.

The resident experts from the non-profit organization affiliated with the park provided the curriculum during the program. The curricular focus of the program was on the geology, ecology, and natural history of the park. The specific focus of each lesson depended upon the instructors passion and knowledge. At the core of the curriculum is a description of the history and present condition of the biotic and abiotic surroundings, and a culminating project where participants argue for the protection of Yellowstone.

Participants and Setting:

The participants chosen to attend this program were usually 11 years old and entering sixth grade in the upcoming academic year. For most, it was their transition summer into middle school. The participants were from diverse ethnic and socio-economic backgrounds. One of the selection criteria for participation was that the children chosen would likely never visit Yellowston National Park without this program. During both years of this study, last minute substitutions of participants were required. Two were due to participants getting in trouble with the community youth organization and thus a revoking of their option to go. A third was due to a family custody dispute. Another participant's legal guardian passed away a week before the trip, thus temporary custody had to be determined in order for her to go on the trip. These last minute changes speak to the complexity of the participant's lives.

Yellowstone consists of several thousand square-miles of mostly undeveloped land in a mountainous region. Thus it serves, like all National Parks, as a vestige of land minimally impacted by human development. This allows for habitat for several large mammals that need

large undisturbed spaces and are not found in many other places in this country. The park is at an altitude several thousand feet above where the youth participants live, which required some acclimation. The parks unique fauna and geology attracts visitors from all over the world.

The first summer, participants stayed in rustic cabins in groups of two to four in a remote area of the park. The restrooms were located in another building and bison were known to roam through the cabin area. Exterior lights did not exist, thus the participants had to use flashlights to walk from their cabins to the bathrooms, and often took pleasure in scaring each other by saying that they saw bear or a bison while they journeyed to the restroom. The people in charge of the cabins were not used to having a large group of children in that space. There were many rules, and the children were oriented to them the first day. In the second year of this study the participants stayed in houses right outside the park and near a town. This helped to avoid the previous described tensions.

Research Findings

A theme that emerged from the data was that the physical realities of the accommodations during the first year of this study created conflict with several participant's lived realities. The cabins they stayed in had doors which the youth were not suppose to lock. Bathrooms were in a separate building and required the use of a flashlight and traveling in pairs in order to use them in the evenings. Participant observation data revealed these aspects of residential program created stress for many participants during the experience, and was reflected on by two participants during the post experience interviews.

Retrospectively, for some, the difference between the National Park and their lived realities, led to reflections on Yellowstone as a peaceful place. For one individual the difference was so vast from her city life she saw the park as filled with "nothing".

The social world created by participants and environmental educators during a residential program and it's interactions with individual's cultures and lived realities also needs to be understood . The participants are at an age where peer social relationships are very important. This can lead to many positive interactions (see Chapter 2&3) and also tensions.

Residential Environmental Education Culture and Children's Lived Realities Clash

During the first year of the study when the participants arrived at the cabins they were oriented to the rules. One rule required the children to not lock their cabin doors. Some of the participants spoke up and asked why, others quietly expressed fears. They were told that the locks did not work and they could lock themselves in or out. They were also reassured by the staff that 'crime does not occur here'. Notes from participant observation show participants questioning why and some quietly describing how it was counter to the reality they experience back home.

> At one point Barbara (staff) explained the cabin doors "do not lock". Ursula asked "why don't you lock the doors". Isabela (chaperone) joked it was because Ursula is "from the ###" (area code where most participants are from). Sayen (staff) was explaining how the locks were faulty and people would likely lock themselves in, and "there is no crime here". Maya sitting at my table, not very loudly said "there is always shootings by my place".

The next morning a pair of participants locked themselves out of their cabin. It is unclear if they had locked their door during the evening or in the morning as we were leaving for the day, and if they were doing it to protect themselves or the things they were leaving behind.

Below are my participant observation notes.

> At morning breakfast we learn that Bryon and Apollo locked themselves out of their cabin this morning. I never heard if they accidentally or purposefully locked it. By the time we were leaving for the day, Bryon was back at the bunkhouse looking for a key. Not sure if it was locked again or never was opened in the first place

The incident was used to remind students not to lock their doors. On their way to the National Park I had observed Apollo showing Bryon the items he had brought on the trip. Thus they may have locked the doors to protect the things they were leaving behind.

Ursula, the participant who asked for an explanation on the first night of why not lock the cabin doors, did not appear comforted by the explanation given. During the second day of the residential program she asked one of the park staff again to explain why he (along with everyone else) did not lock their cabin doors. In my participant observation notes I observed

> Ursula asked William during the drive back "why don't you lock your doors when sleeping?". He explained that it's so no one is locked out at night, because there is only one person in the whole place with a key."

Ursula described in a post-experience interview that her roommate would tease her about her fears.

> Tasha told me that...since our cabins were called buffalo cabins that they were going to come in our rooms and eat us. I was so scared. I think that was the most scariest thing ever. And we couldn't lock our doors so it was like oh my gosh.

Nineteen months later when interviewed, Ursula would cite the inability to lock her doors as one of her least favorite experiences. She also noted the difference between where she lives, where you have "to constantly lock your doors and watch over stuff".

The fact that participants had to walk to another building to use the bathroom also created fears for some of them. As described above, there were no exterior lights, so the participants moved from cabin to the bathroom via a flashlight. They were instructed to always walk in pairs because of the potential of running into wild animals, most notably bison. On the first night, I

heard youth expressing fear as they walked to and from their cabins and also taking the opportunity to scare each other as they walked. The next morning a participant, Nereus, expressed his fears. From my participant observation notes

> The conversation in the bus is about their first night. Nereus says he "was scared" and ran to the bathroom. It's very dark at night due to the lack of city lights intruding. On the first day, many of the students expressed their fear of the dark verbally.

When I interviewed Nereus eighteen months after the experience, he described his least favorite experience as walking through the dark to get to the bathroom.

> It was because it was like outside. Like if I have to go to the bathroom I have to wake up my friend and I didn't want to wake them up— so, I still woke them up and I am like, I need to go to the bathroom and he was like, no. So, I still have to go to the bathroom and we both go out there. It's just really weird just to go out there at night when there is bison and stuff out there.

For the participants, the fear provoked by the physical realities of the residential program, were verbalized during the residential experience and retained and reflected on over a year and a half after the experience.

Synthesis

This data showed that the lack of acknowledgement of participants lived realities (i.e., living where you need to always lock your doors and where there are shootings) created fear during the residential environmental education experience for some participants, and that negative experience was also reflected on after the residential program. These findings are similar to what Tzou et al. (2010) found, that the narratives of a residential program discounted the lived realities of some participants, but this study also showed a lasting negative memories tied to those experiences. The participant who asked during the residential program why the doors could not be locked, was given explanations, but was never asked her perspective.

Creating a space where participants could explain what the experience meant from their viewpoint could have facilitated an understanding of their "narratives".

Having to travel through the dark night (unassisted by outdoor lights) to go to the bathroom, after you have been warned about the potential to run into a bison, elicited fear in many of the participants. This fear seems reasonable, and the experience very different from participants lived realities. The participant who brought up his fears during the residential program, also negatively reflected on the experience after the program. The physical realities of the cabin set-up that year could not have been changed, but this experience could have been an opportunity for adult to facilitate border crossing.

This research contributes to the literature an empirical understanding of the consequences of disappearing residential program participants' narratives. When putting urban youth, with little experience in the natural world in semi-natural settings, discomfort and fear maybe pervasive. It would serve this and other residential programs to create a space where these fears can be discussed and worked through.

The Retrospective Finding of 'Peace' in Difference

For many of participants the difference between where they lived and what they experienced at the National Park was vast. For some that difference retrospectively translated into seeing the National Park as "peaceful" and "not busy" and for some the contrast was so large the park was filled with "nothing". During post experience interviews, which happened 9 to 19 months later, some participants reflected on the pictures and place as being peaceful and not like the city.

When Adela was asked over a year after her experience, what she felt about the Park. She contrasted it to city living.

> I like how peaceful it is unlike in the city and stuff. And it was very clean and like refreshing kind of.

She also explained that she wanted to print some pictures from the residential environmental education experience to put in her locker, because they were "peaceful".

Prior to attending the residential environmental education experience, Samantha spent time in woods near her home hanging out with friends. Thus pictures of the National Park landscape was tied to a sense of freedom, as seen in her response to viewing one of her pictures .

> This one I like because it reminds me like just free range, being able to go anywhere really. And not really.. like carrying what's going on.. Like drama in the world. Just like being able to be free and roam.

She also noted while viewing pictures of features unique to the park, that there was nothing like that back home "just city life". And when asked what she felt about Yellowstone, she explained

> What I feel is really hard to explain, because I felt so many things there.....like... Free first off, instead of seeing cars screeching by buildings and everything all we saw was really cool wildlife and it amazed me how different places could be.

Ursula, did not see the usual city cues in the National Park, which translated into her remembering a placid space, devoid of people, even though millions of people visit the park each summer. "It was basically like just land— roaming land where there is no one. It was very quiet". The message she had for next year's participants "basically it's just a mellow quiet place there with nothing to see but animals."

For another participant, the lack of city life translated into a park filled with nothing. Tasha was a self described "city" girl. She, enjoyed taking photos of the landscape while in the National Park. During a post-experience interview she referred a picture of the landscape as "nothing".

> If I would go to the woods I would take pictures because I love taking pictures of nothing...stuff like this.

Even though Tasha admits she enjoyed taking picture of landscapes, she also saw the pictures as empty of what was usually found in her world.

Synthesis

Kahn (1999) research on youth's understanding of environmental issues and their valuation of the natural world found youth had "generational environmental amnesia". A phrase he used to describe youth's propensity to assume the properties of the environment they are surrounded by, are 'natural' and how things should be. Thus many of these participants' lived reality of the urban environment was their measure of normal on which to contrast the semi-pristine environment of the residential program.

This appeared to be the case for some participants and the contrast for their daily lives and the National Park translated into memories and feelings of a peaceful place that allowed for freedom, and void of their city lives. For others the lack of city life translated into a National Park filled with 'no one' and 'nothing'. This gives an empirical understanding how youth interpreted the residential environmental education experience through the lens of the their own experience.

Social Situations

During adolescents peer relationships become increasingly important. For some of the participants of this residential program, the social aspect of the residential experience was what made it meaningful and memorable (Ch. 2 &3). However, the social spaces created by participants can also be a place for negative social exchanges.

Social dynamics create tension

During the post-experience interview two girls described their least favorite experience during the residential environmental education experience as 'the drama'. Both were referring to a specific incident where someone put toothpaste on the door knob of a cabin. There were girls who were not getting along, and several were moved between cabins to keep the peace. The 'tooth paste' incident was a finale to the drama. When it happened the chaperone in charge, called all the girls together to explain her disappointment and to find out who was responsible for the incident. What ensued was a sharing out session, and the girls shared their fears, thoughts, and stresses. Many of their concerns reached back home, involved recent losses or previous negative social situations created by peers.

The details of what was shared were personal and do not belong in this study. What the situations speaks to, however, is the participants' stresses and concerns they brought with them to the natural setting of this residential program. It also brings to light the strong affect of peer social pressure on these participant's educational endeavors in the past and during the residential program. Thus these previously unknown aspects of the participant's lived realities were playing a part in the social dynamics that occurred during the residential program.

After the sharing out, the social dynamics were more harmonious. However, the 'drama' and how it was reflected on by two participants over a year later, shows the need to manage social situations. The management of adolescent social dynamics is necessary for learning to occur. The sharing out made visible some of the drivers of the social dynamics and of

individuals concerns and behaviors. It allowed those previously invisible concerns to be addressed and moved beyond.

The chaperones were managing the social dynamics at an individual level (room moves and one-on-one discussions). The sharing out exposed how those dynamics were affecting all the participants and their contributions to it.

Race and Ethnicity

Race and ethnicity are seldom acknowledged in environmental education research, unless it is one of the attributes of the individuals being assessed, even though they are a part of everyone's lived realities. How this residential program interacted with different participants lived realities dealing with their race and ethnicity is important to understand from a critical theory perspective.

On our first day of travel, as we waited for our bus to arrive to take us to the airport, Annette, a Caucasian girl from a very rural, mainly white community and Tasha, an African American girl from the middle of the medium sized city had a confrontation. From my participant observation notes I noted:

> Annette rushes from the bathroom with Tasha following. Annette goes and stands near staff. Tasha goes and sits by Tom and starts to explain what is happening.

Eventually Annette sat down with the group that Tasha had assembled, and after a few minutes Annette gets up and leaves and gestures towards Tasha with her hand up. Chaperones noticed the exchange and arrived at the table, they were told that Tasha had told Annette "you don't know me" and Annette responded with " I wouldn't want to". This tension persisted through the beginning days of the trip, with the chaperones taking both girls aside and having conversation to dissuade tensions.

When I asked what was at the center of this conflict, a chaperone explained that Tasha 'senses' when White kids are afraid of her 'out loudness and Blackness'. The chaperone also explained that where Annette lived there were few African Americans and the use of negative racial epithet was not uncommon. The lived realities of each of these participants collided during this residential program that served to bring them into contact.

Holland et al. (1998) discussed how individual's social realities would interact with and co-create the 'figured worlds'. This incident showed that individual's social realities created tension within the residential environmental educational program around race. In an analysis of racialized talk in middle school, the Schulz et al. (2000) argued "it is critical to examine the ways in which talk about race in inter-racial context remains taboo in society at large..". However the authors point out "when educators are able to shift the interactional dynamics in order to reframe conflict, there is an opportunity for learning" (Schultz, Buck, & Niesz, 2000). This incident was resolved, but it is unclear if it became a learning opportunity.

For other participants race and ethnicity was a part of their conversations during the residential program. This part of their lived reality is often made invisible in educational settings, including environmental education programs (Schultz, et al., 2000).

For example Selena was proud of her Filipino heritage and would often discuss her family and heritage with other participants and staff. She had a conversation with a peer facilitated by a family reunion t-shirt she was wearing that had happened in the Philippines. I overheard her explain to him "I'm a Pacific Islander. Philippines are an island". Below are part of my participant observation notes.

> Fernando then asked if Selena was born there. She said no her mom was. He asked if her mom was Filipino. She said "I'm not going to bother….read my shirt". It's a family reunion shirt that happened in the Philippines'. Selena

> appears annoyed by his questions and trying to figure out if he is trying to be offensive.

During the trip Selena shared stories about bullies at school and elsewhere and how she had experienced and confronted some of the bullying herself. Many stories were of what other youth her age experienced around bullying and how some of the conflict was situated around race. Her past experiences may have made her peers response unclear as being naive or intentionally offensive.

During the end of the residential program, Selena found another participant where the conversation about her ethnicity became a point of bonding and affiliation. From my participant observation I recorded:

> At ice cream the other day Selena asked Carmella what "culture" she was. Carmella replied mixed but mainly Asian Pacific Islander. They high five and say 'A.P. ' Carmella explains her mom is mostly Filipino and Selena says "my whole family is"

Selena stood out as one of the few participants wanting to discuss race and ethnicity in the two years of the study. The only other participants who I noted discussed race and ethnicity was Tom, a Caucasian male. Below are notes from my participant observation.

> Tom seems more willing than most (or have more of a need?) to discuss race. He has often made comments about being Mexican and talks with a fake Spanish accent. In a discussion about a staff member at the community youth organization, he described the person as Black. Ursula said "he's brown, I hate when people say black". Tom responded with "that's what he's called, am I really white" as he waves is hands towards her.
>
> Ursula, the person correcting Tom is African American and a friend of Tom's.

His friend and roommate was Latino and it is unclear if his comments about being Mexican stemmed from their relationship or something else.

In another episode I recorded Tom describing another staff member of the community youth organization as "that Asian guy". The only Asian participant of the program was sitting in front of Tom at that time and noted the comment with a "hey". Tom giggled and said “did I offend you”, the participant did not engage him in conversation, instead Tom and his friend jokingly discussed if the comment was offensive.

Synthesis

A vast majority of the social interactions during the residential program were positive and remembered as such. However, adolescent social dynamics can and did create negative social moments. In this kind of program context, with youth who only somewhat know each other adults often need to facilitate conversations to decrease tensions and increase peer understanding. As peer relationships are important for academic success and social adjustment (Wentzel, 1998).

Being able to discuss race and ethnicity is important, but rare in many educational settings (Schultz, et al., 2000). Because it is part of participants lived realities a space needs to be created where conversations can occur. It is also important that adults take on the role of conversation facilitators. Not only to disarm conflicts, but also to provide youth with the skills necessary to converse about a topic in which many adults have difficulty discussing. The adult coaching and mentoring could minimize offense and increase understanding between participants.

Conclusions

This study attempted to empirically understand how a residential environmental education experience interfaces with participants culture and lived realities. The physical realities of the living quarters during one year of the study clashed with some participants lived realities, creating fear during the residential program and negative memories. It can be argued that new and unique experiences will likely occur during a residential program, especially for urban youth with little experience being in semi-natural places. Novelty experiences can elicit both excitement and fear. What these data showed was that for some participants it was more than novelty that elicited fear, it was the incongruity of what they experienced during with the residential program with their lived realities.

Is pushing a participants comfort zone a damaging thing, or could it lead to an expansion of their worldview? Many environmental programs, like this one, try to provide new, unique experiences that have the potential of pushing youth's comfort zone (ex. night walks, hiking, being around animals/insects, being in a place where you do not need to lock your doors). The argument in not, to try and avoid any situation which pushes participants out of their comfort zones. Instead, the recognition that this residential environmental education program (like all education settings) created its own cultural niche, which both included and shut out aspects of participant's cultures and lived realities. Thus residential programs need to create, at a minimum, a space where participants fears and concerns can be heard and lived realities understood. This could help minimize participants distress about safety concerns, by acknowledging the fears and where they come from.

Another possibility, from science education literature, is merging the residential program culture with the participant's cultures and lived realities more intentionally and more deeply. Science education in informal setting focused on diversity and equity recognizes the importance

of understanding what part culture plays in educational settings (Bell, et al., 2009). The creation of a third or hybrid space, which combined participants culture and lived realities with the culture of science, has been found to empower those from non-dominant cultures (Gutierrez, 2008). The quotation below if from a study of urban girls in a middle school science class who were incorporating their lived realities into the science lessons.

> By drawing and validating from such nontraditional funds of knowledge, teachers co-construct anti-oppressive hybrid spaces with their students: Teachers learn where their students come from, build on their out-of-school proficiencies, and make connections between their existent knowledge..
>
> (Barton, Tan, & Rivet, 2008, p. 99)

In an evaluation of a residential program which attempted to bridge the academic content with the participants "lived realities", the authors found the program had positive short term impacts on the three outcome goals; environmental responsibility, leadership and attitudes toward school (Stern, Powell, & Ardoin, 2011). Many of the participants were from urban settings and thus

> ..each day's experiential environmental lessons, which take place in the multiple habitats on and surrounding the site, are explicitly linked to life lessons relevant to the students home environments. (Stern, et al., 2011, p. 112)

It should be noted that there is not a singular urban culture, however a recognition of students lived realities, along with lessons of student empowerment and character development the authors argued were "keys to success" of the program (Stern, et al., 2011).

Middle school is a time significant youth development and identification and when peer interactions increase in importance to youth. It is also a time where social hierarchies and

interactions can create negative (or positive) social dynamics. Positive Youth Development (PYD) is defined as young people gaining skills and assets (such as conflict resolution skills, connectedness, ability to navigate multicultural contexts, and civic engagement) during pivotal developmental times, in order to negotiate negative influences (Eccles, 2002). Environmental educators have acknowledged that some environmental programs, focused on action and empowerment, serve as spaces for positive youth development (Schusler & Krasny, 2010; Schusler, Krasny, Peters, & Decker, 2009; Stern, et al., 2011).

Residential environmental education programs have the advantage of an immersive experience in order to focus on participants PYD. And this specific case study showed that social dynamics played a part in participant's experience. These social dynamics need to be acknowledged and facilitated, within residential environmental education programs.

Being able to navigate multicultural contexts, is one of the skills or assets for PYD. For the participants of this residential program, race and ethnicity was a part of their lived realities, however discussion of race and ethnicity is not often facilitated in formal learning settings (Schultz, et al., 2000). Some program participants wanted to engage in discussions of race. Because some participants do not necessarily have the language or skills to discuss race and ethnicity (while being inclusive and non-offensive), the conversation requires adult facilitation.

That would also require adults with the training and skills to facilitate those conversations. As Claude Steele notes, discussion of race in our country is difficult, as individuals do not want to be constrained by (or validate) stereotypes tied to their race. He states that "unless you make people feel safe from the risk of these identity predicaments" in settings where there are people from different background they will not be able to "work comfortably or well together" (Steele, 2011).

Future work should focus on how to co-construct with participants hybrid spaces within residential environmental education programs. And what the program facilitators can do to both understand and incorporate participant's cultures and lived realities into the residential environmental education experience.

For this program, one shared reality all participants have in common is being members of a community youth program. Chaperones managed social dynamics under the auspice of the community youth organizations culture of positive youth development and respect for each other. However, much of the social dynamics occur during non-instructional time. Thus efforts need to be made to teach participants how they can help create a safe space for others to learn and experience the National Park. That includes adults facilitating conversations about race and ethnicity.

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Chapter 5

Synthesis of Research Findings

The goal of this dissertation was to understand how participants experienced and what they gained from a residential environmental education program from an ecological learning perspective. The first chapter provides a literature review of environmental education and describes the need for expanded methods of research to increase inclusivity. The second chapter is the first empirical understanding of participant's different interaction stances with the natural world during a residential program and how those stances were tied to participants prior knowledge, experience, identity and interest . Chapter three provides a long-term understanding of changes to participants attributed to the residential program in terms of identity, interest and stewardship and what triggered the revisiting of their memories about the program. The fourth chapter reveals how the lived realities of participants interacted with the residential program.

The Ecological Understanding of a Residential Environmental Experience

These articles (chapters) serve to provide new ways to empirically understand a residential experience and its outcomes. To date most research on residential experiences have focused on pre and post changes of participants knowledge, attitudes or behaviors, but none have tried to understand how an individual's cognitive, social, and cultural experience affected their learning process in a residential environmental education setting.

The experiential differences found during the program can serve future programs and research, and below are some suggestions for the program under study and other residential

programs.Using identity, interest, and stewardship as the definition of environmental connection proved useful in understanding interactions and detecting changes after the program. However, other changes were seen that were not originally a part of the research questions, such as perception change and social changes. Thus future research needs to be open to finding other changes important to participants that they attribute to their residential experience.

This was the first attempt to understand how participants lived realities interacted with a residential experience. Recognition of the lack of homogeneity in participants lived realities can help improve residential experience for all. Below are my suggestions of future research directions to build upon this work and a discussion on how this research informed my conceptual framework

Recommendations to Residential Programs

Increase Connection to Local

This residential experience is different from most others as the participants live several states away from the National Park they visited. However, other residential programs also deal with participants, who may live nearby, but who have never experienced the natural world in their own neighborhoods or in semi-pristine areas near their homes. To prevent the participants from misunderstanding that the natural world is only found in semi-pristine areas, not in urban settings,the curriculum needs to make visible the natural world that is part of the participants lives. This is done somewhat, with pre-program field trips of this residential program, however the focus of most of the field trips was not the local, urban green space or living organism.

Thus residential programs could tie what the participants experience in the program to what is more proximate when they return home. For example, instructors could point out which

animals and plants they are seeing during the residential program can be found in the participants home state or local park. Also they could discuss what other National Parks exist nearer to where the participants live.

The culminating experience of this residential program was to get the youth to argue for Yellowstone's protection. However, for most participants, they could not translate that desire into action back home. For some that was due to lack of proximity, for others it had to do with lack of stewardship experience. Either the residential program or the community youth organization could build within the program actions individuals could take to create change to their local environment. Those could range from individual behaviors they can take part of at home or environmental actions, such as being a part of local park restoration efforts.

For many of the urban and suburban participants of this program, their connection to the natural world was playing outside. Program staff could use participants' experience with outdoor play to connect to the residential program space by playing games together outdoors. These games could have an educational component and would utilize active learning. If participants learn games which they can take home with them this would allow for a way to revisit the experience when they return.

Scaffolding experience

For every educational experience, including residential environmental educations experiences, scaffolding what was learned or experienced during the program has the potential to build on outcomes. In this study several of the participants interviewed after the experience shared what they learned or experienced during the residential program with science teachers, other teachers, and classes. Sharing the experience at school can serve to scaffold program

memories. And for some, it also may have served to increase their interest in the natural sciences, the subject matter of the residential program. Letting future participants know that past participants have shared their stories with teachers and classes and utilized the knowledge gained, can make visible how their knowledge and experience could be used and revisited within a formal learning setting.

As this study found, certain things triggered participants thinking about their residential experience. Figuring out what those triggers for this and other residential programs can be used to create those triggers. For example many participants said knowing and seeing a past or future participants of the residential program at club triggered thoughts about their own experiences. Thus creating post-experience opportunities for alumni could also be an important way to reinforce the experience. For this program, creating an opportunity for alumni to take part in pre-event trips or even to select a few to serve as mentors for future trips, could also serve to support the continued impact of the experience for past and future participants.

Families are an important conduit for participants pursuing interests created during the residential program when they return home. Thus incorporating families more into the experience (pre or post) may allow for increased by-in and support from families once the youth return. This could also serve to broaden the effect of the residential program, as seen in the case of two participants, where the youth had family members participate in their new interests (ex. camping and fishing).

Stewardship, Community Action, and Agency

In this study it was found that the stewardship message may have been more subtle then realized or at least not easily translated to participant actions. Prior research has found long-term

changes in behavior after participants attended a residential program which had explicit conservation behaviors as part of its curriculum (K. R. Liddicoat, 2013).

However, studies have shown that maybe the focus needs to go beyond individual behavior change. A review of research on how to promote environmental stewardship in youth recommends that youth have peer and adult role models, experience nature, are given voice and decision making opportunities, age appropriate environmental activities, and development of environmental action skills (Chawla & Cushing, 2007). Many of the recommendations for creating environmental stewards directly overlap with what community youth programs describe as conditions necessary for positive youth development (PYD).

Research has shown a focus on environmental action, versus individual behavior change, does benefit the individual development. A study of participants and practitioners facilitating local environmental action within schools, informal education environments and community organization, found "striking similarities between our results and theory and empirical research on PYD, and came to understand environmental action as an important context for young people's personal growth" (Schusler & Krasny, 2010, p. 209).

Findings regarding the impact of local environmental action on individuals and communities show they can be synergistic. Research on motivation and the perception of success of practitioners involved in environmental and social change, found practitioners had a passion for nature and/or social justice they wanted to share with youth (Schusler, et al., 2009). The researchers found the facilitators purposes for engaging youth in action were many fold; from increasing appreciation of nature, increasing relevance of science, youth development, and creating informed citizens. All practitioners working in low socioeconomic status, urban, predominantly African-American or Latino neighborhoods had as a goal the development of youth's

abilities to envision a more just society and for the youth to become change agents towards that end (Schusler, et al., 2009).

Thus is appears that providing participants knowledge about how to behave more environmentally friendly when they return home, can be successful in creating individual change, and is something this program could add to the curriculum. However, this and other residential programs could also go beyond providing knowledge about behavior change and instead focus on environmental action, to both create the skills to be stewards and to use it as a venue for PYD. Thus that would mean developing environmental action skills and giving participants voice in decision making during the residential program. Then trying to facilitate age-appropriate environmental activities during the program and after their return.

Managing participant dynamics

Classroom dynamics can substantially add to or detract from the learning environment. The same is true for a residential program, however individuals are not just sharing classroom space they are also sharing free-time and social space. That increases the importance of managing social dynamics to prevent youth from creating an unsafe learning environment, and denying individuals the potential to learn and grow.

This program has the advantage of being facilitated by a community youth organization (CYO), where staff likely have an understanding of participants lived realities. Also the CYO has a clear ground rules of respect to work from towards PYD. However since much of the social dynamics occur during free time it is important to recruit all participants to be respectful to each other at all times.

For other programs, managing youth dynamics during residential programs would be just as important. I suspect there many team building tools utilized during residential program to

'recruit' positive participant interaction. It is important to recognize, however, if new staff members are serving as the instructors, they need to be given the tools to manage social dynamics, as it is a learned skill. Also I feel all staff of residential programs (or any learning environment) need to be taught the skills necessary to facilitate conversations on race and ethnicity. As race and ethnicity are a part of participants lived realities, and it is a conversation many adults do not feel comfortable having.

Study Limitations and Next Steps

This case study was of a unique residential program, in both the distance between where participants lived and the residential experience and the multiple stakeholders who provided the experience. Thus the results may not be directly applicable to other residential programs. However many of the recommendations above could apply to other residential program. The proposed studies below also speak to increasing applicability to other programs and progressing from where this research left off.

Conclusions and Recommendations for Future Research

Identity and The Natural World

Identity played an important role in how participants engaged with the natural world in this study. A first step in future studies would be to see if these engagement stances can be seen during other residential programs. And if so, the next focus should be on understanding more the relationship between identity and the engagement categories.

Are the environmental identities and/or place identities for residential environmental education program participants what drives their expectations and interactions and helps explain the interaction differences? Are there programmatic ways to facilitate identity development during a residential program which develops interactions with the natural world?

The different stances were created with data collected during and after the residential program. Is there a way to determine prior to a residential experience the prior knowledge, experience, identity and interest of individuals and thus design curricula or activities that meets them where they are? For example, pre-surveys could ask participants about the amount of time they participated in various activities outdoors, and if they have interests in science, school, stewardship, animals, or other relevant features of the program. The idea would be to try and create a way to understand the identities or interests participants bring to a residential program. That knowledge could facilitate the creation of curricular or down-time events that are tied to those interest or identities.

If the socially focused individuals stood out during the pre-trip survey. Energy could be put toward team building and directing their attention to place and the natural world using their social focus as a leverage . Long-term future work could try to determine if interest changes created after a residential program can evolve into identity changes with the scaffolding of the experience.

Creating the Learning Environment That All Feel Safe

Future design based research studies, should focus on creating conditions that recognize, respectfully surface, and work to decrease fears. Those efforts would create a continually evolving curriculum, where fear is minimized and the experience increases in inclusivity and

impact. Design based research can also focus on what team building exercises, messages or program structure facilitates buy-in by participants to assist with positive social dynamics.

Stewardship Message

Becoming a steward of the natural world is a long-term developmental process. There is evidence from prior studies that if you want individual behavior change it needs to be a part of the curriculum. The residential program in this study could add to the curriculum what individual behaviors participants could take part in when they return home. The stewardship message should be focused on the participants lived realities. The comparison of changes in stewardship identities after the message was added to the curriculum versus these two years of data, would give evidence of the message affecting stewardship identity.

Beyond individual behavior change, future research could build on past research tying together environmental action and positive youth development and environmental stewardship. It would be informative to try and find a residential program with a focus on environmental action skills versus a similar one that focuses on individual behavior change (or neither), and see how interests, identity, and stewardship of participants' was affected.

Incorporating Lived Realities and Creating Hybrid Spaces

The creation of hybrid or third spaces, requires instructors letting go of the expert role and allowing students to co-create knowledge while incorporating their own lived realities. For most residential programs, this task would likely not be possible as relationships need to be built for the space to be created. If a residential program was to take on this task it would require training of staff to facilitate that space.

However, a starting point would be incorporate participant's cultures and lived realities into the residential environmental education experience. Design based researchers could work with residential programs on how to incorporate participants lived realities into the curriculum or structure of the program. It would also be important discern if incorporation of lived realities into a residential program facilitated changes in participants interest or identities after attending the residential experience.

Refinement of Conceptual Framework

The three stances of engagement with the natural world are evidence of the varied connection of the participants to the natural world. The results of this study show that those most engaged had the most experience, knowledge, interest and identified with the natural world. Because of this study's structure I was not able to discern the direct influence of culture/lived realities on participants environmental connection, however the results support the idea that multiple social supports were necessary to facilitate that connection. Thus future work should try and understand how culture and lived realities directly influence environmental connection, and also how the variables of knowledge, experience, and culture and lived realities influence each other and thus youth's environmental connection. This understanding could help future environmental programs support and resource shifts of participants to the engaged stance.

Some of the changes seen after the residential program had nothing to do with interest or identity in the natural world. I believe this speaks to the youth being in a developmental place where they a negotiating and coming to understand who they are. This residential experience influenced important identity shifts, and those shifts need to be added to future conceptual frameworks.

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