University of Nevada, Reno

The Impact of Nature Based Guidance Lessons on Third Grade Students' Anxiety and Connection to Nature

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ABSTRACT

This study investigated the effect of nature-based guidance lessons, a specific application of ecotherapy, on anxiety and connection to nature among third grade elementary school students. Ecotherapy has been an effective treatment for anxiety among adults, but there is scant literature regarding ecotherapy treatment for children, and no other studies thus far have examined ecotherapy as implemented by a school counselor (Han, 2009; Jordan, 2009; Wilson et al., 2011). Additionally, some researchers have postulated that connection to nature mediates the positive outcomes observed from ecotherapy treatment (Bird, 2007; Otto & Pensini, 2017). An elementary school was recruited through convenience sampling and the specific classes included in this study were four third grade classes, representing the entire grade level at the school. Participants were given anxiety (BAI-Y) and connection to nature (CNI) assessments one week immediately before and after the six-week intervention. Data was analyzed using a two-way mixed ANOVA for each assessment, and t-tests were done to establish group equivalence at baseline. Results for the BAI-Y indicated a significant interaction between treatment condition and time ($F(1,58)=14.772, p<.0, η_p^2=.203$), but no significant within groups effect ($F(1,58)=2.856, p=.096, η_p^2=.047$). Results for the CNI indicated no significant interaction between treatment condition and time ($F(1,58)=0.052, p=.821, η_p^2=.001$), but a significant within groups main effect ($F(1,58)=4.48, p=.039, η_p^2=.072$). Thus, the intervention lessened anxiety for those in the experimental group and connection to nature increased among both groups. More research in the area of ecotherapy in school settings is recommended to further investigate the findings of this study.

Keywords: ecotherapy, anxiety, connection to nature, guidance lessons, school counselor
DEDICATION

For my father, James Michael Sheridan

Shirts in the closet, shoes in the hall
Mama's in the kitchen, baby and all
Everything is everything
Everything is everything
But you're missing

Coffee cups on the counter, jackets on the chair
Papers on the doorstep, but you're not there
Everything is everything
Everything is everything
But you're missing

Pictures on the nightstand, TV's on in the den
Your house is waiting, your house is waiting
For you to walk in, for you to walk in
But you're missing, you're missing
You're missing when I shut out the lights
You're missing, when I close my eyes
You're missing, when I see the sun rise
You're missing

Children are asking if it's alright
Will you be in our arms tonight?

Morning is morning, the evening falls I got
Too much room in my bed, too many phone calls
How's everything, everything?
Everything, everything
But you're missing, you're missing

God's drifting in heaven, devil's in the mailbox
I got dust on my shoes, nothing but teardrops

-Bruce Springsteen
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CHAPTER I: INTRODUCTION

A Brief Introduction to Ecotherapy

The Development of Ecopsychology

The idea that humans have an intrinsic relationship to the earth is not new, it has been documented in various fields throughout history (Davis & Atkins, 2004). Over the last few decades, more attention has been given to the psychological connection to nature, which is often related to the biophilia hypothesis (Benfield, Rainbolt, Bell, & Donovan, 2015). The biophilia hypothesis assumes that humans have a natural attraction to life-supporting environments in order to improve survival, stress management, and mental well-being (Benfield et al., 2015). Adding further support for the interdependence of humans and nature are the findings of Davis and Atkins (2004) that personal health in physical, psychological, and spiritual domains is related to planetary health. Not only are human health and planetary health interdependent, but there are many therapeutic benefits associated with being in nature such as improved attention, mental clarity, and both physical and emotional well-being (Davis & Atkins, 2004).

Unfortunately, people are spending so much less time in nature over the past few decades that Richard Louv (2005) coined the term Nature Deficit Disorder after discovering the negative effects that lack of natural interactions have on children, including cognitive, emotional, and physical impairments. Counselors are called on to address many of these issues and so they are beginning to become more aware of ecological issues (Tudor, 2013). While cognitive behavioral therapists have long been using natural environments to expose clients to certain phobias, ecopsychology, or the incorporation of nature-based methods and philosophy, has yet to be meaningfully
integrated into therapeutic practice (Blair, 2013; Jordan, 2014). Reese (2016) addressed the issue of the absence of ecopsychology in mainstream therapy approaches in the observation that there is inadequate literature available.

In the seminal work by Theodore Roszak (1992), the goal of ecopsychology was described as bridging the gap between psychology and ecology, and to see the connection between the needs of humans and the earth. This definition was expanded on by Kamitsis and Simmonds (2017), who explained that the psyche is sympathetically bonded to the earth. The foundational definition provided by Roszak (1992) has been used by many authors in their research in the theory and application of ecopsychology (Blair, 2011; Davis & Atkins, 2004; Jordan, 2014; Surridge, McKie, Housden, & Whitt, 2004; Tudor, 2013). Additionally, some authors have expanded this definition to explicitly include the emotional component that bonds people and nature (Blair, 2011; Pienaar, 2011). Jordan (2014) alleged that not only is there a connection, but there is human suffering from disconnection, which can be seen as psychopathology that worsens as the disconnection becomes greater. Jordan (2014) and Surridge et al. (2014) also share this notion of suffering from disconnection, but further claimed that ecological destruction is a projection of current human anxiety and psychological distress. This belief is one of the core concepts of ecopsychology, and thus ecotherapy, which has been labeled eco-anxiety by Hasbach (2015). Due to the destruction of the natural world, many people are experiencing eco-anxiety, or feelings that existence itself is on the brink of ruin (Hasbach, 2015).

The term ecopsychologist encompasses professionals from many related fields, such as psychology, counseling, and therapy, but all are interested in the relationship
between natural environment and human identity, emotion, behavior, and attitudes (Blair, 2013). Mental health professionals, such as licensed counselors, are in an optimal position to deliver therapeutic services with an ecopsychological focus, known as ecotherapy.

The Emergence of Ecotherapy

The influential work of Howard Clinebell (1996) set the tone for ecotherapy definitions, applications, and understanding. Clinebell (1996) clearly explained the different terms associated with ecotherapy including ecopsychology and biophilia. According to Clinebell (1996), ecotherapy differs from ecopsychology and is a more appropriate term for counselors because the focus is on healing and growth, and is the application of ecopsychological ideas in therapy. Clinebell (1996) also asserted that biophilia, or a fondness of and attraction to nature, is an essential component of human health, and as such ecotherapy incorporates biophilia into therapeutic practices. Furthermore, nature is considered a co-therapist in the client-therapist-nature relationship (Clinebell, 1996).

Building on Clinebell’s (1996) works, Buzzell and Chalquist (2009) referenced Clinebell’s definition of ecotherapy, but also added that ecotherapy is an “umbrella term for nature-based methods of physical and psychological healing” (p. 18). This expanded definition provided by Buzzell and Chalquist (2009) is frequently cited in the literature by many authors, specifically, the description of ecotherapy as an umbrella term was the most common dimension of all definitions provided (Jordan, 2014; Jordan & Marshall, 2010; Kamitsis & Simmonds, 2017; Wolsko & Hoyt, 2012). While ecotherapy may be used as an umbrella term, at the basis it is a form of psychotherapy that addresses the
human-nature relationship through interventions that bring clients in direct contact with nature (Buzzell & Chalquist, 2009). From this framework, ecotherapy is built on the theoretical, cultural, and critical foundation of ecopsychology (Buzzell & Chalquist, 2009). For the intent of this paper, nature-based guidance lessons are the specific ecotherapy intervention that was used. Therefore, nature-based guidance lessons are one specific application of ecotherapy that fall under the umbrella of nature-based methods.

Broadly, ecotherapy is giving clients a place to make contact with nature because nature itself is healing (Chatalos, 2013; Sackett, 2010). Healing happens within the context of relationships, so whatever the specific intervention chosen, the overarching goal is the same: to heal the human-nature relationship (Buzzell & Chalquist, 2009; Jordan, 2014; Sackett, 2010). Ecotherapy uses a broad assortment of practices, but all are conducted using natural resources and/or in the natural world to promote interconnectedness between humans and nature (Kamitsis & Simmonds, 2017; Sackett, 2010; Tudor, 2013). This study used a school based ecotherapy practice by implementing nature-based guidance lessons, which enabled students to spend more time outdoors, fostering healing through increased contact with nature.

**Connection to Nature and Children**

The average American is now spending about 90% of their life indoors, with children averaging 30 minutes per week outdoors, yet spending over 50 hours a week on electronic devices (Greenleaf, Bryant, & Pollock, 2014). Spending such a disproportionate amount of time inside has been referred to by Greenleaf et al. (2014) as the “disease of indoor living” (p. 163) because it is linked to many negative outcomes across physical, mental, cognitive, and emotional domains. Conversely, rates of anxiety,
depression, stress, and mood disorders are significantly lower in areas with more green spaces (Greenleaf et al., 2014). This is likely because interactions with nature are an important part of helping people establish (or re-establish) their well-being (Howarth et al., 2016).

Not only does spending time in nature improve all domains of health, but it has also been linked to significant improvements in stress levels, attentional capacity, cognitive functioning, physical pain, physical healing, productivity, and risk of morbidity (Greenleaf et al., 2014). Tudor (2013) found that psychological distress can be treated effectively by developing a positive connection to the natural environment, further underscoring the positive effects of nature on human well-being. Not only is nature an important factor in well-being, but connection with the natural environment is also important for children’s healthy development (Greenleaf et al., 2014). Spending more time in nature was linked to improved cognitive, emotional, and moral development (Greenleaf et al., 2014). Additionally, children who spend more time in nature are less likely to have mood disorders, including anxiety, depression, and Attention Deficit Hyperactivity Disorder (ADHD), or ADHD symptoms (Greenleaf et al., 2014). Conversely, spending more time indoors actually worsened symptoms of such disorders (Greenleaf et al., 2014).

While nature has a positive effect on many physical, mental, and emotional domains for both children and adults, interactions with the natural environment also improves students’ classroom and learning experiences (M. Lee, Oh, Jang, & Lee, 2018). The positive benefits of being in nature are associated with an innate desire and tendency to want to be connected to nature (Capaldi, Dopko, & Zelenski, 2014). Research shows
that adults who have a strong connection to nature also spent more time outdoors as children, highlighting the importance of developing this connection in childhood (Capaldi et al., 2014; Otto & Pensini, 2017). Additionally, there is a correlation between connection to nature and psychological well-being, social behaviors, and happiness indicating that people more connected to nature also have better mental health, social relationships, and are happier (Capaldi et al., 2014; Howell, Dopko, Passmore, & Buro, 2011).

**Significance of the Problem**

**The Need for Ecotherapy Research**

Burks and Caan (2005) have highlighted the issue of limited research in the area of ecotherapy and have called for clinical and educational organizations to conduct more quantitative research in order to bolster support for natural interventions. Thompson (2009) also argued that more data-based research in the field of ecopsychology is necessary for the field to progress, because most of the academic literature found was either based on books or was qualitative in nature. Therefore, there is a real need for more quantitatively driven studies in ecopsychology to help the discipline grow, progress, and evolve. To date, most research that has been done on the benefits of nature was conducted with adults, and the majority of the research with children has taken place outside of schools (Maller, 2009). Furthermore, the empirical findings of these studies have been narrowly focused on specific benefits of being in nature, such as recovering from stress and attention restoration, even though there are many reasons exposure to nature is beneficial (Mayer, Frantz, Bruehlman-Senecal, & Dolliver, 2009).
Perhaps one of the biggest reasons there is not more research in the area of ecotherapy is because many practitioners are unaware of its existence. Only 26% of counseling practitioners could recall learning anything about the influence of nature on mental health in their graduate education (Wolsko & Hoyt, 2012). Even practitioners with positive attitudes about benefits of nature did not actually engage in ecotherapeutic behaviors because of perceived obstacles like limited time, boundaries, confidentiality, office location, and lack of knowledge in nature-based techniques (Wolsko & Hoyt, 2012). However, more therapists who are trained to work indoors are beginning to take their practice outside (Jordan, 2014). The trend of more counselors moving outside highlights the importance of well-informed research to guide these professionals, of which there is currently very little.

The Research Gap: Ecotherapy in Schools

While ecotherapy research in general is scant, no ecotherapy studies were found specific to school counselors. There have been studies conducted in schools by therapists, psychologists, and teachers, but so far, no studies have investigated ecotherapy as implemented by the school counselor via guidance lessons. Nature-based learning in the elementary schools is becoming more popular when teaching science lessons, but has yet to be meaningfully incorporated into non-STEM subject lessons (Camasso & Jagannathan, 2018). However, even though more science lessons are taking place outdoors, there are mixed reports on the effectiveness due to the very limited research. Bird (2007) reported that only 53% of elementary school aged children were able to correctly identify wildlife, but 78% of them could correctly identify Pokemon characters, which underscores the disconnect children today have from nature.
While some children may prefer to play indoors or in structured activities, common factors that limit children’s contact with nature are both fear and lack of encouragement on behalf of parents and schools (Bird, 2007). Additionally, research shows that children generally prefer to play in natural environments when given the choice (Bird, 2007). Although children benefit from virtual experiences with nature such as through photos, videos, and other artificial means, Mayer et al. (2009) found a significant difference between participants who experienced virtual nature and those who made physical contact with nature, showing that real contact was more impactful on psychological domains. Therefore, it is important to bring children physically outside of the school to foster a meaningful relationship and experience with nature, rather than simply incorporating natural elements (such as bringing in leaves or rocks for a project) into the classroom. Based on this research, there is a crucial need for more ecotherapy studies, especially in the schools, as this is a potentially powerful intervention that could be implemented by school counselors across the country and beyond.

**Importance of this Study**

Approximately 350,000 generations before us have lived close to nature in meaningful ways, and it has only been “…a tick of the clock that we have spent in highly urban settings, working in concrete buildings, driving in climate controlled cars, and living in relatively densely populated areas, shut off from nature.” (Mayer et al., 2009, p. 635). Recently, due to fears, urbanization, the rise of technology, and increased demands on schools, children have fewer opportunities to engage with nature than any generation before them (Flom, Johnson, Hubbard, & Reidt, 2011; Greenleaf et al., 2014; Louv, 2005; Sackett, 2010). However, this trend contradicts research that supports the
importance of children spending time outdoors. Louv (2005) highlighted the importance of teaching children to positively interact with nature because their future relationships with nature will have an important effect on the environment and all life. Carter (2016) further underscored the importance of caring as a critical component of early childhood education and asserted that nature is an “incredible resource” (p. 10) to teach about caring and foster social-emotional development. Not only does spending time in nature provide positive benefits, it is crucial to healthy development and social relationships, both of which are core components of guidance lessons as detailed by the American School Counselor Association (ASCA) curriculum standards (ASCA, 2012).

While time spent in nature is only one factor contributing to children’s healthy development, there are numerous underlying factors for childhood emotional disorders, which may hinder their development. Children today are facing significantly higher rates of mental and emotional disorders, with anxiety affecting 6-18% of all elementary school children in the United States (Brown, 2013). Anxiety is one of the most common childhood emotional disorders, but unfortunately, Swank, Cheung, Prikhidko, and Su (2017) found that only half of all children with emotional disorders receive interventions, and that is only accounting for children with an identified disorder. Failing to identify mental health needs of children and provide services may ultimately lead to costly psychiatric treatment and/or involvement in the juvenile justice system (Swank et al., 2017). Children with emotional disorders, such as anxiety, in elementary schools are more likely to have other negative long-term outcomes such as low academic achievement, school suspensions, delinquency, developmental issues, substance abuse, difficulties with relationships, and an increased risk of suffering from mental health
disorders as adults (Grills-Taquechel, Fletcher, Vaughn, Denton, & Taylor, 2013; Kösters et al., 2017; Sanchez et al., 2018; Swank et al., 2017).

Therefore, based on the information presented, ecotherapy interventions at the elementary school level may be an invaluable tool for school counselors. This study is necessary to further investigate the potential effectiveness of such an intervention, as no studies have yet explored nature-based guidance lessons. Furthermore, the role of the school counselor in implementing ecotherapy interventions is nearly non-existent in the literature, highlighting the importance of gathering more information on this specific sub-population of counselors.

**Rationale**

**Ecotherapy as a Treatment**

Over twenty years ago, before smartphones and iPads, researchers were already concerned that children were not getting enough time outdoors, which has only decreased as technological advances have increased (Rivkin, 1997). Allen (2013) also contends that children must bond with nature early in childhood if we expect children to develop healthy relationships with nature, among the other benefits associated with natural environments. Additionally, there is support for the biophilia hypothesis, which proclaims that humans have an innate affinity toward life and life-supporting environments, both for survival, lower stress, and improved mental condition (Benfield et al., 2015; Wilson, 1984). Hence, it logically follows that ecotherapy has proven to be an effective treatment for anxiety, depression, life stress, concentration, self-discipline, mental fatigue, physical health, and even mortality (Bird, 2007; Han, 2009; Jordan, 2009; Kamitsis & Simmonds, 2017; Wilson et al., 2011). Even for those not seeking a specific
treatment, time spent in nature improves attention, mental clarity, and physical and emotional well-being (Davis & Atkins, 2004). Furthermore, nature-based education and experiences bolster children’s prosocial behavior and development (Acar & Torquati, 2015). Ecotherapy is therefore a practical intervention for a wide variety of students, and could be implemented in a school setting.

**School Based Interventions**

Limited time spent in natural environments hinders children’s development of sense of self and interpersonal skills, and unfortunately, schools contribute to these negative outcomes by reducing the amount of recess, physical education, and time outdoors available to students (Sackett, 2010). Even the presence of natural light is critical to children’s development because light affects bodily functions such as blood pressure, pulse, respiration rates, and brain activity, including the output of serotonin (Tanner, 2009). However, many of today’s classrooms are windowless or poorly lit, which negatively interferes with the body’s circadian rhythms, an experience similar to jet lag (Tanner, 2009). Tanner (2009) found that students in classrooms with natural light performed significantly better than students in classrooms without natural light on science and reading measures, indicating the importance of natural elements in school settings.

Lovelock, Walters, Jellum, and Thompson-Carr (2016) reported that one of the biggest barriers to child and adolescent participation in nature-based activities is parental constraints on when and where children can play due to perceptions of safety and fears. Children have the most opportunities for contact with nature during school, which is where they spend most of their day (Barton, Sandercock, Pretty, & Wood, 2015).
Furthermore, the school can also provide a safe outdoor space to help combat parental fears about outdoor play. One way to provide more opportunities to connect with nature at schools is by incorporating outdoor activities that strengthen the relationship between nature and children, while also providing learning experiences (Louv, 2005). Nature-based education programs and lessons have distinct advantages over traditional indoor classes because of the many opportunities to explore, move around physically, and enhanced emotional and cognitive functioning (Carter, 2016). Open, natural spaces, such as the fields on school grounds, are preferable because they provide more opportunities for children to use their imaginations than other outdoor spaces, such as playgrounds (Barton et al., 2015). Playgrounds and other man-made structures can hinder the positive effects of being in nature because nature, in and of itself is healing (Sackett, 2010).

**Intent**

**Statement of the Problem**

Over the past few decades, children have been spending more time away from their homes than ever before, in part due to child care, school, sports, lessons, camps, and so on, all of which limit the amount of time that can be spent outdoors (Rivkin, 1997). When children are home, they frequently engage in watching television and playing video games, rather than spending time outdoors (Rivkin, 1997). Children are spending mere minutes outside every day, but anywhere from two to seven hours a day is spent indoors using computers or tablets, watching television, and playing electronic games (Flom et al., 2011). One study found that children in the United States spend only 50 minutes per week in outdoor activities, but spend about 45 hours either sitting or being sedentary, primarily during the roughly 32 hours they are in school each week (Allen,
As the average time children spend outside decreases, it has become increasingly apparent that nature plays a vital role in healthy development, adjustment, and learning (Flom et al., 2011). Many researchers have echoed this notion and found a variety of ways that nature serves as a protective factor and a treatment. For instance, Han (2009) found that students were significantly less anxious and had lower blood pressure when they had visual access to nature. Similarly, both Bird (2007) and Wells and Evans (2003) found that time spent in nature moderated stress and reduced the risk for developing stress related illnesses among elementary school children. Spending time in nature also supports children’s healthy development and acquisition of life skills (Buchan, 2017).

Therefore, it is important to study the effects of spending more time in nature on elementary school students because it may help them across academic, developmental, emotional, physical, and mental domains. With childhood emotional disorders on the rise, taking classrooms outside is a cost-effective intervention that is fairly easy to implement. Children have limited opportunities to get outside, so schools can provide this in a safe manner. However, more research is needed on the outcomes of nature-based interventions in order to justify any potential changes in curriculum or policy. School counselors are in an optimal position because not only can they bring their guidance lessons outside, they are uniquely qualified to address the issues around emotional well-being and mental health.

**Purpose of the Study**

The purpose of this study is to identify the effects of nature-based guidance lessons by analyzing elementary school students’ levels of anxiety and connection to
nature before and after implementation of the lessons. This study adds valuable quantitative findings in the growing field of ecotherapy. An increase in knowledge about these effects will assist school counselors, principals, and research professionals by potentially expanding the range of interventions available to them. The results of this study, in conjunction with future studies, may also shape school policies regarding time spent in outside of the building.

Research Question

1. What are the effects of nature-based guidance lessons on elementary school students’ levels of anxiety and connection to nature, as measured by Beck’s Anxiety Inventory for Youth and the Connection to Nature Index?

Definition of Terms

Ecotherapy is an umbrella term for holistic treatment modalities and interventions that include the natural world in the counseling process and relationships; or applied ecopsychology (Chalquist, 2009; Buzzell & Chalquist, 2009; Wolsko & Hoyt, 2012). For the intent of this paper, nature-based guidance lessons are the specific ecotherapy intervention to be applied.

Anxiety is mental, emotional, and physiological experiences that include worry, unease, and fear about future events or actual situations. Anxiety is distinguished from fear because fear is an adaptive response, whereas anxiety is an excessive reaction to a future or actual threat (Foa, Franklin, McLean, McNally, & Pine, 2017).

Connection to nature is likened to a personality trait that encompasses a sense of oneness with nature (Capaldi et al., 2014; Howell et al., 2011; Mayer & Frantz, 2004; Mayer et al., 2009).
Guidance lessons are structured and developmentally appropriate lessons designed to assist students in achieving the guidance curriculum competencies (ASCA, 2012).

Nature-based guidance lessons are standard guidance lessons that will be conducted outdoors on a green field (as pictured below) in this study.
CHAPTER II: LITERATURE REVIEW

Ecotherapeutic Roots

Underlying much of the ecopsychological movement toward a healthy relationship with the environment and sustainable behaviors is the fact that our current rates of population growth and consumption of resources are not sustainable (Mayer et al., 2009). Thus, not only is our relationship with nature an important component of well-being, it is also critical for the health and longevity of the earth itself (Mayer et al., 2009). However, health organizations and researchers have typically placed more emphasis on very specific domains of health as related to the environment, such as obesity, but less attention has been given to the holistic relationship between human and environment (Burls, 2007). This holistic relationship is the core of ecotherapy, which has evolved from the biophilia hypothesis, meaning “love of life or living systems” (Greenleaf et al., 2014, p. 162) and is characterized by the desire to connect with the natural environment.

Leopold (1949) highlighted the importance of this connection to foster sustainable behaviors, “We abuse land because we regard it as a commodity belonging to us. When we see land as a community to which we belong, we may begin to use it with love and respect.” (p. viii).

The Biophilia Hypothesis

Humans have an innate tendency to connect with other living things, including not only other humans, but also the natural environment (Wilson, 1984). Connection to nature has served evolutionary purposes, and up until recent years, humans lived in very close connection with nature (Wilson, 1984). It was necessary to live in harmony with nature in order to survive; thousands of generations needed to be in tune with the land in
order to secure food, water, and shelter (Wilson, 1984). Therefore, even though we are more disconnected from nature today, the desire to connect with the natural environment is still very much a part of our genetic make-up (Wilson, 1984). Wilson (1984) contends that the inherent affinity for nature cannot be separated from humans because it has been programmed into our DNA as an evolutionary necessity. The biophilia hypothesis can be summarized as the “innate tendency to focus on life and lifelike processes” (Wilson, 1984, p. 1).

Findings from more recent studies showing that humans prefer landscapes similar to East African savannahs when given a choice lend further support to Wilson’s (1984) biophilia hypothesis, that affinity for nature is part of our evolutionary heritage (Bird, 2007). Biophobia, or negative experiences and responses to the natural world, also lends support to the biophilia hypothesis because of the prevalence of adaptive phobic responses to certain stimuli, such as snakes, heights, spiders, dogs, and other natural dangers (Gullone, 2000). From a practical standpoint, it would make more sense to be phobic of common, modern dangers, such as handguns, but phobias of things such as snakes and spiders are significantly more prevalent even though our interactions with them are typically rare (Gullone, 2000). Since common phobias are not reflective of lived experience, it is more likely there is a biological and evolutionary basis, which is in line with the ideas proposed by the biophilia hypothesis (Gullone, 2000).

Furthermore, Kellert (1993) detailed nine perspectives from which humans relate to nature across physical, emotional, and cognitive domains, all of which are biologically based in order to enhance survival throughout evolution. The nine perspectives are utilitarian, exploitation for basic survival needs; naturalistic, happiness from contact with
nature; scientific, desire to study nature and biology; aesthetic, preference for nature views; symbolic, using natural and animal symbols for communication; humanistic, emotional connection; moralistic, ethical responsibility; dominionistic, destruction and control of nature; and negativistic, fear and aversion (Kellert, 1993). Kellert’s (1993) description of these nine ways in which we relate to nature also support the biophilia hypothesis, as they are biologically driven.

**The Ecological Ego**

In his seminal work, Roszak (1992) contends that industrialization has cut humanity off from an ecological unconscious, described to be the core of the mind. This core of the mind is an ecological ego that develops along ethical lines, resulting in responsibility for the self and the planet as one in the same (Roszak, 1992). Roszak (1992) described this interdependent relationship between human and nature as, “the needs of the planet are the needs of the person, the rights of the person are the rights of the planet” (p. 321).

The eight guiding principles for the development of ecopsychology are: the ecological unconscious is the core of all human minds; the ecological unconscious represents the cosmic evolution of the universe; parallel to psychoanalysis, ecopsychology also aims to bring the (ecological) unconscious mind to the conscious in order to engender a mutually beneficial relationship between human and nature; the ecological unconscious has an active role during childhood, allowing children to experience the natural world in harmony with their own sense of being; the mature ecological ego is parallel to humanity’s ethical responsibilities to one another; ecopsychology has roots in ecofeminism, which rejects masculine dominance and the
Ecopsychology of nature; ecopsychology is not always at odds with industrialization, but believes in empowerment rather than domination; and ecopsychology contends there is synergy between planetary health and personal well-being (Roszak, 1992). These guiding principles set forth by Roszak (1992) have helped shape the development of both ecopsychology in theory and ecotherapy in practice.

**Ecotherapy in Practice**

**Recent studies.** As previously mentioned, there is very limited research in the field of ecotherapy, but there have been some promising findings of the studies conducted. White et al. (2013) conducted the first longitudinal study investigating the effect of green space on people’s life satisfaction and mental distress at different points in time, while controlling for factors such as socioeconomic status (SES), employment, education, and crime, and individual factors such as age, education, marital status, income, and number of children. The researchers used data from a British Household Panel Survey that measured life satisfaction at approximately five different points in time over 17 years for residents of England (White et al., 2013). This study found that individuals were happier when living closer to green spaces and/or gardens than when they were farther away, as evidenced by lower levels of mental distress and higher levels of life satisfaction (White et al., 2013).

Similarly, Barton and Pretty (2010) conducted a meta-analysis and found a correlation between mental health and proximity to green space, indicating better mental health the closer the green space. Furthermore, the risk of mental illness actually decreased as the proximity to green space increased (Barton & Pretty, 2010). Not only does living near green space improve mental health, but Burls (2007) found that
practicing therapists saw more and enhanced improvements on positive behavior changes when working with clients outside, or incorporating aspects of nature into their sessions.

**Benefits.** Research shows that spending time in nature improves all domains of health, but it has also been linked to significant improvements specifically in stress levels, attentional capacity, cognitive functioning, physical pain, physical healing, productivity, and risk of morbidity (Greenleaf et al., 2014). Ecotherapy has effectively treated certain mental and physical illnesses such as ADHD, anxiety, dementia, concentration, stress, cognitive development, and sense of well-being (Bird, 2007). More specific to school benefits, Swank et al. (2017) found that spending more time in the natural environment improved academic achievement, on-task behaviors, and an overall decrease in disruptive classroom behaviors. Additionally, nature-based education has improved attention, motivation, behavior, self-esteem, motor skill development, knowledge transfer, and coping among children (Flom et al., 2011).

**Foundations of Ecotherapy**

Overly individualistic models of self and well-being do not accurately portray many of the world’s cultures, do not account for gender and class differences, and do not reflect interdependence of people (Wolsko & Hoyt, 2012). Furthermore, existing theories of child development are anthropocentric, meaning that development is determined by human forces, whereas ecopsychology contends that environment also plays a vital role in development (P. Lee, 2012). Ecopsychology advances the knowledge and practice of psychology and psychotherapy in an ecological context and offers psychological solutions to ecological problems (Wolsko & Hoyt, 2012).
Two major theories that have been foundational to ecotherapy research and development will be discussed in detail; Ulrich’s (1983) psychological-evolutionary Stress Reduction Theory and Kaplan and Kaplan’s (1989) Attention Restoration Theory (ART). Ulrich’s (1983) theory contends that restoration comes from stress reduction, whereas the Kaplan’s (1989) postulated that stress is reduced because of attention restoration. Both of these theories have guided the theoretical underpinnings of this study, and the emergence of ecotherapy.

**Stress Recovery Theory**

Among both North American and European people, there is a strong preference for natural views, even when they are subpar compared to urban views (Ulrich, 1983). Ulrich (1983) postulated that the restorative effects of nature would be greater for those experiencing stress or anxiety at baseline because they started further away from a calm psychophysiological state, which is produced by visual access to nature. Ulrich et al. (1991) found that even virtual exposure to nature generated significantly more effective stress restoration than viewing urban scenes. Furthermore, looking at natural scenes also resulted in a more positive affect, such as feelings of satisfaction and joy (Ulrich et al., 1991). One explanation for the expedited stress recovery found after visual exposure to nature is the possibility that the parasympathetic nervous system is activated when looking at natural scenes (Ulrich et al., 1991).

Ulrich (1983) defined affect as an “innate, cross-cultural phenomena, each having characteristic experiential, facial, and neurophysiological components.” (p. 87). Research supports that affect is innate, not a learned experience, such as the findings that even blind children use facial expressions, these expressions are the same across cultures,
including isolated cultures, which all indicate emotional experiences are universal and intrinsic to humanness (Ulrich, 1983). Ulrich (1983) contends that affect precedes cognition, and that positive affective responses to certain stimuli in nature are connected to survival. Therefore, not only are affective responses adaptive, they also influence what is thought of the environment, which in turn shapes other thoughts, which impacts behavior and mood (Ulrich, 1983). Some of these adaptive responses or behaviors include exploration, activity, psychophysiological restoration, attending to a threat (fight or flight), and vigilant scanning (Ulrich, 1983). All of the mentioned behaviors are motivated by an affective response, such as interest, joy, fear, etc., which moderates the state of arousal (increase or decrease) in order to carry out the behavior (Ulrich, 1983). Thus, Ulrich (1983) built stress reduction theory around biological processes related to stress and affect, where visual access to nature reduces stress and thus allows for more positive feelings.

**Attention Restoration Theory**

Although research shows there are many benefits to spending time in nature, there is much less clarity on the theoretical underpinnings of these findings, with the two major theories emphasizing attention restoration and stress reduction (Kaplan, 1995). Attention Restoration Theory (ART) was developed out of the earlier work of William James, who had differentiated between attention or focus that is voluntary and that which requires mental effort (Kaplan, 1995). ART was further supported and guided by the findings of clinical neurologists who initially described the concept of directed attention, which plays a key role in executive functioning, due to the need for sustained focus (Kaplan, 1995). Neurologists also took note that directed attention can be fatigued, but because their focus
is on rehabilitation, there was not much emphasis on the role attention fatigue plays in mental processes, leaving room for ART to be developed (Kaplan, 1995).

Kaplan and Kaplan (1989) postulated that there are two different types of attention, direct and indirect. Direct attention requires focus and tires out the mind after being used for a sustained amount of time, whereas indirect attention, also called fascination, requires little to no effort and provides restorative benefits (Kaplan & Kaplan, 1989). Fascination can further be broken down into hard, soft, and low fascination; both hard and soft fascination allow attention recovery, but hard fascination does not allow for reflection, whereas low fascination has limited capacity for both (Kaplan & Kaplan, 1989). While there are other ways to restore direct attention, time spent in nature is the most effective because it contains the four core qualities necessary for restoration; engaging in fascination, being away from regular activities, extent (immersion in the environment), and a compatibility with expectations (Kaplan & Kaplan, 1989). There is no substitute for the natural environment; the positive effects arising from contact with nature cannot be reproduced through other stimuli, at least not with the same power or significance (Kaplan & Kaplan, 1989). The benefits of attention restoration are a clearing of the mind, recovery from mental fatigue, and reflecting on personal problems and larger life questions (Kaplan & Kaplan, 1989).

Attention fatigue has a detrimental impact on several mental domains including problem solving abilities, emotion regulation, impulse control, perception, cognitive processes, and the ability to reflect (Kaplan, 1995). Since directed attention is fragile and susceptible to fatigue, restoration is an important component of mental health and overall well-being (Kaplan, 1995). Engaging in fascination, or indirect attention, is one practical
way of resting direct attention (Kaplan, 1995). Sleep is the most obvious way to rest
direct attention, but is also impractical because it can’t be used throughout the day
whenever direct attention becomes fatigued; hence the importance of fascination (Kaplan,
1995). Additionally, fascination may come from a variety of sources, many of which are
easily found in natural environments, such as watching a sunset, taking a walk, cloud
gazing, observing animals, and so on (Kaplan, 1995). Fascination is a “necessary, but not
sufficient basis for recovering directed attention” (Kaplan, 1995, p. 173) because it is one
of the four components needed for restoration.

Another critical aspect of nature’s restorative capabilities is being away from a
daily routine (Hartig, Mang, & Evans, 1991; Kaplan & Kaplan, 1989). Being away is
often referred to as “getting away” and does not necessarily indicate an entirely different
environment, this can be accomplished by just changing views (Kaplan, 1995). While
many people yearn for vacations in natural settings, this is often not a practical option, so
nearby natural environments offer a practical way to generate the feeling of being away
(Kaplan, 1995).

The third component, extent, refers to the environment’s ability to provide a rich
experience that engages the mind and is substantially different from the typical or daily
environment (Kaplan, 1995). The environment does not need to be exceptionally large or
wild, it only needs the ability to provide feelings of being in another world, which could
be anything from a small Japanese garden to the distant wilderness (Kaplan, 1995).

Finally, compatibility means that the environment must fit the individual’s
purposes and expectations, so that the activities carried out are appropriate to the setting
and run smoothly (Kaplan, 1995). The common roles people take up in nature are that of
predator or hunter, locomotion (hiking, biking), domestication or gardening, observation, and survival or camping (Kaplan, 1995). Whatever role an individual plays in their relationship with nature, it is important that expectations, abilities, and the physical space chosen are all compatible.

**Attention Fatigue and Students.** There is further support for ART specific to school settings, as research has shown that children suffer from attention depletion, which has a detrimental impact on their cognitive, emotional, and physical well-being (Bird, 2007; Greenleaf et al., 2014; Han, 2009). Even elementary school students without emotional disorders are susceptible to mental fatigue, or the exhaustion of attention, due to their frequent need to sustain focused attention (Han, 2009). The taxing school environment induces anxiety and stress even among healthy students with no mental or emotional disorders (Hoffert, 2018). Among elementary school aged children with mood disorders, access to green outdoor spaces reduced the symptom severity, and these findings remained consistent after accounting for variations in activities, demographic factors, and disorder severity (Han, 2009). For the more general student population, interaction with nature has improved mood, behaviors, academic achievement, and reduced mental fatigue (Han, 2009; Swank et al., 2017).

**Ecopsychology and Ecotherapy**

In his seminal work, Theodore Roszak (1992) coined the term ecopsychology, which he described as bridging the gap between psychology and ecology, and the interconnection between the needs of humans and the earth. Based on this work, ecopsychology can broadly be conceptualized as an interdisciplinary theory that incorporates environmentalism and psychology. Roszak (1995) also argued that humans
cannot understand themselves if we ignore the earth because it sustains us, and well-being is both personal and planetary. Therefore, human health is directly related to the health, or lack thereof, of the earth. One of the core tenets of ecopsychology is that destruction of the earth creates psychological distress and anxiety (Jordan, 2014).

Unfortunately, environmental destruction and sustainability are issues humanity as a whole is currently facing at unprecedented extremes due to climate change, deforestation, depletion of the ozone layer, pollution, among other ecological issues (Chatalos, 2013; Tudor, 2013).

Ecopsychology plays a vital role in addressing the current sustainability crisis because the roots of this crisis lie in the toxic relationship humans have with the natural world (Hasbach, 2015). Ecological destruction is causing a type of distress termed solastalgia, which is defined as “a feeling of desolation or melancholia about the emplaced and lived experience of the chronic deterioration of a loved home environment” (Hasbach, 2015, p. 206). A specific experience of stress related to ecological destruction is known as eco-anxiety, or feelings that existence is on the verge of collapse (Hasbach, 2015). Hasbach (2015) contends that the rise in rates of depression and anxiety is likely linked to eco-anxiety and a destructive relationship with the natural world. Therefore, ecological issues are presenting more and more in a counseling context because of the distress people are feeling about the current state of the environment. Ecopsychology has influenced counseling by “expanding the context in which therapists’ work with clients to include not only intra-psychic influences, interpersonal relationships, family systems theory, cultural/social systems, but also the ecological context—making a person’s relationship with the natural world a salient topic for therapy” (Hasbach, 2013, p. 228).
As ecopsychology continued to develop and influence the field of counseling, along came the emergence of ecotherapy, which was first coined by Clinebell (1996) in his ground-breaking book, *Ecotherapy: Healing Ourselves, Healing the Earth*. Similar to Roszak (1992), Clinebell (1996) described an interconnected and interdependent relationship between humans and the earth, known as the ecological circle. Clinebell (1996) expanded ecopsychology into a methodology that can be used in practical application by counselors, which he termed ecotherapy. The dimensions of ecotherapy as described by Clinebell (1996) include inreach, developing a positive relationship with nature, upreach, developing a spiritual connection to nature, and outreach, active ecologically sustainable attitudes and behaviors.

Ecotherapy is set apart from ecopsychology by emphasis on the interconnectedness between people and nature, whereas ecopsychology emphasizes understanding human well-being in a planetary context (Buzzell & Chalquist, 2009; Roszak, 1992). For this reason, ecotherapy can be understood as applied ecopsychology and as encompassing many therapeutic techniques (Chalquist, 2009; Buzzell & Chalquist, 2009; Wolsko & Hoyt, 2012). For instance, while many counseling theories can be incorporated into an ecotherapy framework, the tenents of person-centered therapy can be applied to nature, such as the necessary conditions for growth and change and an engaged, but non-directive attitude (Tudor, 2013). However, this also means the counselor must first assess their own ecological attitudes, whether through a formal assessment or an informal reflective process, before taking an ecotherapeutic approach to counseling (Clinebell, 1995). Sticking with person-centered theory, the counselor can then extend unconditional positive regard from the client to unconditional respect for the natural environment.
After the counselor has begun to deepen their own connection to the earth and starts to conceptualize their well-being as interdependent with planetary well-being, ecotherapy can become the vehicle that helps clients move toward healing.

When counselors begin incorporating ecotherapy into their practice, it is important to focus on more than just being in nature. While being in nature itself does have healing potential and benefits, the ecotherapist sees planetary health as an essential component of personal health, and thus encourages clients to reflect on this deep connection known as the Circle of Reciprocal Healing (Buzzell, 2016; Sackett, 2010). These two approaches to ecotherapy are described by Buzzell (2016) as level one and level two ecotherapies, where the main difference lies in whether the counselor takes a human-focused approach (level one) or a systems approach (level two). Ecotherapists actively work toward the implementation of a level two approach to counseling because it is more holistic and actively considers the needs of the environment in the process (Buzzell, 2016).

**EcoWellness.** Further expanding on the integration of ecotherapy and counseling includes adapting wellness models to reflect the human and nature relationship (Reese & Myers, 2012). Wellness models grounded in counseling do not include nature even though nature has been linked to wellness (such as decreased depression and anxiety) across physical, mental, and emotional domains (Bird, 2007; Reese & Myers, 2012; Swank et al., 2017). Thus, EcoWellness was constructed to aid professionals with the integration of nature into all aspects of counseling, including assessment, planning, treatment, and evaluation (Reese, 2016). This model provides an empirically based
framework for counselors in traditional settings to integrate nature in meaningful ways throughout the counseling process (Reese, 2016).

EcoWellness is defined by Reese and Myers (2012) as a sense of appreciation, respect for, and awe of nature that results in feelings of connectedness with the natural environment and the enhancement of holistic wellness. Wellness is further defined as a way of life oriented toward optimal health and well-being, in which body, mind, and spirit are integrated by the individual to live life more fully within the human and natural community (Reese & Myers, 2012).

The EcoWellness model is composed of seven elements that are organized into three dimensions (Reese, 2016; Reese & Myers, 2012). The first dimension is access to nature, which includes physical access, the ability to physically interact with nature and sensory access, the ability to use the five sense to connect with nature (Reese, 2016; Reese & Myers, 2012). The second dimension, environmental identity, includes elements that are related to incorporating nature with the concept of self; these elements are connection, pleasant thoughts and feelings toward nature; protection, actively engaging in sustainable behaviors; and preservation, advocating for the natural environment (Reese, 2016; Reese & Myers, 2012). The final dimension is transcendence, which includes spirituality, feeling connected through nature to a higher whole, and community connectedness, or connecting with others in nature (Reese, 2016; Reese & Myers, 2012).

**Literature Relevant to the Research Question**

**Childhood Anxiety**

While more research focuses on anxiety in adults, children can and do experience high levels of anxiety (Chawla, Keena, Pevec, & Stanley, 2014). Furthermore, anxiety
and stress levels are steadily increasing among children and adolescents in the United States, which research suggests is due to actual sociocultural changes, not an increase in adults’ desire to diagnose or pathologize (Chawla et al., 2014). Kang (2017) contends one main reason children today are facing higher rates and intensity of anxiety is because they are too busy with scheduled activities and do not have enough time to get adequate sleep, nutrition, and attend to their other needs. Whatever the underlying causes, anxiety is a common mental health issue for elementary school aged children and increases the risk that these students will suffer from anxiety disorders in their adult life (Kösters et al., 2017). In fact, although adults are typically thought of as the consumers of psychotropic medications, children between the ages of 5-10 are being prescribed more and more medication for mental health related concerns (Bird, 2007). It is estimated that over 40,000 children are using mood stabilizers to treat conditions such as anxiety, and this trend has been rising for the last decade (Bird, 2007).

Anxiety is typically expressed and experienced as physical arousal, distorted cognitions, and avoidance behaviors, all of which can have a negative impact on children’s learning and development (Grills-Taquechel et al., 2013). Anxiety and other mood disorders usually manifest before 14 years of age, highlighting the importance of prevention and intervention beginning in elementary school (Sanchez et al., 2018). One of the main contributors to anxiety and other mental health issues is stress, and children who spend more time in nature are at a significantly reduced risk of developing stress related illnesses (Bird, 2007). Nature offers a variety of benefits to children, but of particular importance is the role nature plays in coping with stress; the calming effects of nature were significantly more pronounced among children who had recently experienced
a stressful event (Bird, 2007). Wells and Evans (2003) also found that nature effectively moderated life stress among a sample of children in grades three to five. Thus, several studies have shown nature served as a protective factor against stress and anxiety (Bird, 2007; Wells & Evans, 2003).

Mental disorders arising at an elementary school age usually persist throughout the student’s lifetime and ultimately lead to significant problems in functioning, including social relationships, substance abuse, suicidality, criminal activity, poor academic and educational achievement, and a low quality of life (Sanchez et al., 2018). Anxiety specifically has incredibly detrimental effects on children’s developing bodies and brains, including weakened immune system and bones, increased risk of cancer, poor academic outcomes, and increased risk of substance abuse later in life (Kang, 2017). Anxiety also impacts young students’ abilities to concentrate, learn, complete tasks, make friends, and their overall life satisfaction (Grills-Taquechel et al., 2013; Maller, 2009). A study of more than 300,000 medical records found that children were especially susceptible to mental illness if they lived far from parks and green spaces, with anxiety and depression being the most prevalent (Flom et al., 2011). Because children experiencing high levels of anxiety are at an increased risk for both mental and physical disorders throughout their lives, the importance of prevention, early detection, and intervention cannot be understated (Chawla et al., 2014).

Anxiety effects 6-18% of elementary school children in the United States, making it a significant public health issue (Brown, 2013). Students with anxiety, both general and specific anxieties, routinely perform worse academically than their peers with no identified anxiety problems (Grills-Taquechel et al., 2013). Low levels of anxiety are
productive and motivate students to do well academically (such as by studying for tests), but high levels of anxiety can be debilitating and cause students to suffer academically, socially, and emotionally (Hoffert, 2018). The recent shift to focus on high stakes testing and to include elementary school students among those being mandated to testing has taken a toll on elementary school students’ mental health, especially when it comes to anxiety (Hoffert, 2018). Since students are also subjected to practice tests, continuing evaluations, and significant preparation for the standardized test, they are being exposed to constant pressure to perform, leading to increases in anxiety (Hoffert, 2018). Persistent anxiety at such a young age has many negative long term effects on academic achievement, social relationships and abilities, mental health, and development (Hoffert, 2018).

Furthermore, school based anxiety, such as test or social anxiety, can lead to impaired cognitive processing, low academic performance, school drop-out, and both emotional and physical problems (Scrimin, Moscardino, Altoè, & Mason, 2016). Scrimin et al. (2016) postulated that attentional bias plays a role specific to school anxiety because children perceive school stimuli, such as teachers, exams, or peers, as threatening and stressful, which in turn initiates a biological response to quickly detect threats by activating the sympathetic nervous system. Attentional bias is also more broadly related to anxiety disorders in both children and adults, because a disproportionate amount of attention is given to emotionally charged stimuli (Scrimin et al., 2016). Scrimin et al. (2016) found that students had an attentional bias toward academic stressors, including students with no known diagnoses, concerns, or school difficulties. These findings indicate that academic stressors produced a strong attentional bias even among healthy
students (Scrimin et al., 2016). Therefore, students are likely at a higher risk for developing anxiety and anxiety related disorders by virtue of simply being a student and coming in contact with common school related stressors (Scrimin et al., 2016).

Time spent outdoors is a protective factor for both mental and physical illnesses including anxiety, depression, obesity, myopia, heart disease, asthma, diabetes, and vitamin D deficiency (Flom et al., 2011). Similarly, Mayer et al. (2009) found that exposure to nature decreased anxiety and other negative states, while increasing positive benefits in health, affect, and cognition. Farnham and Mutrie (1997) also found that outdoor activities decreased tension and anxiety among children. Long lengths of exposure are not necessary to experience these benefits, children can experience an immediate change in mood once they get outside, lessening symptoms of anxiety (Kang, 2017). Chawla et al. (2014) found that being in the presence of trees had positive effects on some of the physical symptoms of anxiety, such as lower blood pressure, improved endocrine and immune system function, and a calmer brain state. However, rather than utilizing the natural environment, most interventions targeting childhood anxiety take place indoors and include deep breathing, muscle relaxation, and guided imagery (Chawla et al., 2014).

**Anxiety and Socioeconomic Status.** Hawkes and Furst (1971) found that of over the 1,200 fifth and sixth grade students included in their study, lower SES students had significantly more anxiety than students from higher SES families and neighborhoods. Additionally, Hawkes and Furst (1971) also found that race was linked to higher rates of anxiety, where black students, especially from inner-city environments, had significantly more anxiety than white students. However, in a more recent study, Farrell, Sijbenga, and
Barrett (2009) found that elementary students from low SES schools had higher rates of depression and low self-esteem, but actually had lower rates of anxiety than students from high SES schools. Although Farrell et al. (2009) did not find low SES students to have higher rates of anxiety, these students do have lower psychological protective factors, and tend to be at a higher risk for developing a psychological disorder. Despite the mixed results regarding rates of anxiety as related to SES, Kim et al. (2015) also asserted that low SES is a significant risk factor for developing psychological problems or disorders. Furthermore, Kim et al. (2015) found that elementary school students from low SES backgrounds were at an increased risk of being the victims of bullying, which further exacerbates the risk for developing psychological disorders. This may suggest that while being from a low SES family alone does not necessarily indicate higher levels of anxiety, these students are at higher risk for developing pathologies including anxiety through mediating factors such as bullying, limited access to resources, and lack of support.

When it comes to treating anxiety and implementing school based programs, researchers have found that despite differences in pathology prevalence between SES groups at baseline, all students benefitted from these interventions. Raimundo, Marques-Pinto, and Lima (2013) found that after one year of participation in a social-emotional learning program, there were no significant differences in gains made between fourth grade students of differing socioeconomic backgrounds. Over 200 fourth graders participated in this study, and all students made significant improvements in social-emotional competencies regardless of SES (Raimundo et al., 2013). Similarly, Skryabina, Taylor, and Stallard (2016) also found that students participating in a program
specifically targeting anxiety benefitted equally, regardless of SES and other demographic variables. Skryabina et al. (2016) implemented the FRIENDS program in over 40 schools, including over 1,000 elementary students, and found that the program was effective for students of many different academic, economic, and geographic backgrounds. The results of these studies suggest that even if there are differences among students of varying SES at baseline, all of them may benefit greatly from an intervention program.

**Ecotherapy Treatment for Anxiety.** Disconnection from nature has not only distorted the identity of humanity and our place in the world, but is also significantly detrimental to mental health (Bird, 2007). Many people will experience mental illness in their life time, about 16% of the world population, with anxiety being one of the most common disorders (Bird, 2007). Han (2009) found that the United States alone spends over one-hundred billion dollars per year on medications for illnesses related to stress, with anxiety disorders being one of the most common. Unfortunately, research shows that people with mental health disorders have an overall lower quality of life and also tend to have problems with their physical health (Wilson et al., 2011). However, ecotherapy may be a promising treatment for anxiety disorders that could potentially help millions of Americans.

In the early 1900s, psychiatrists first observed the powerful effects of ecotherapy when patients’ symptoms started improving after being forced to stay in tents outdoors due to an evacuation of the hospital (Jordan, 2009). Spending time in green space improved concentration, self-discipline, general health, and has reduced anxiety, mental fatigue, and even mortality (Wilson et al., 2011). One study found that access to nature,
both visual and physical, reduced the level of stress and anxiety among participants, even after accounting for variations in gender, age, and socioeconomic status (Han, 2009). Specific to students, Han (2009) found they were more relaxed with nature views, as measured by a state anxiety assessment. Additionally, systolic blood pressure, another measure related to anxiety, was lower among those who spent more time outdoors (Han, 2009).

**Children and Nature**

There are fewer opportunities for children to spend time outdoors today than in previous generations, and there is also less interest as being outdoors is seen as “uncool” with the rise technology providing more appealing, indoor alternatives (Barton et al., 2015). Not only are children limited by parents’ fears, reduced recess time, and increases in technology, but natural space is also physically disappearing from many neighborhoods, schoolyards, and environments (Samborski, 2010). Furthermore, Roszak, Gomes, and Kanner (1995) alleged that teaching children the external world is separate from them strips children of empathy for the earth and results in a psychic numbing. Wells and Evans (2003) lent support to Roszak et al.’s (1995) assertion, because they found young children without safe outdoor spaces to play and explore exhibited poor social, behavioral, and motor skills in comparison to children who frequented natural environments. Bird (2007) highlighted this discrepancy:

> We spend millions to create ideal conditions for our garden plants balancing the right soil with the correct amount of shade and the right moisture, yet we allow our children to grow up in a hostile urban wilderness with concrete walkways, heavy traffic and no contact with nature. (p. 4)
Children have a strong bond with and desire to be in nature, and recent studies show contact with nature is critical to child development (Bird, 2007). Wells and Evans (2003) contend that this desire is innate, and children have a natural preference for outdoor spaces over indoor and/or artificial environments. Children typically describe their favorite places, where they live, and what they do in terms of outdoor play areas (Wells & Evans, 2003). Play in general is a critical component of childhood development, but the effects of play are strengthened when it takes place outdoors because it fosters imagination, physical coordination and strength, and has even diminished instances of bullying (Bird, 2007). However, to reap the benefits associated with outdoor play, children must spend time in nature before age 12, as this was found to be the critical time period where children develop strength and autonomy that arises from unstructured outdoor experiences (Bird, 2007). Furthermore, children who do not develop a relationship with nature are at risk for developing fear, discomfort, or even disgust for nature, which can lead to an array of detrimental consequences for their adult lives, their own children, and the earth at large (Nadkarni, Hasbach, Thys, Crockett, & Schnacker, 2017). Based on this information, third grade students were targeted because at ages eight and nine, they are still within the time period that is crucial to developing a connection to nature.

Adults’ attitudes about being in nature are strongly influenced by their childhood experiences, and those who spent more time in nature as children also have more inner strength and resources, less anxiety, and positive attitudes toward the environment (Bird, 2007). Otto and Pensini (2017) also found that adult attitudes toward the environment are shaped by childhood experiences, which is why it is so important to foster healthy
relationships between young children and nature (Otto & Pensini, 2017). Furthermore, sustainable behaviors are intrinsically motivated, which means that people must want to help the earth because it feels good, rather than for incentives or punishments, both of which are ineffective (Otto & Pensini, 2017). Without a healthy connection to the environment, there is little incentive or motivation for adults to take sustainable actions, which are crucial to the longevity of the earth (Mayer et al., 2009).

Not only will adults reap the benefits from having spent time outdoors as a child, there are many emotional, mental, physical, and academic benefits from contact with nature for children (Bird, 2007). Kuo and Taylor (2004) found that activities conducted in natural environments were significantly more effective for reducing ADHD symptoms among school aged children than those in other settings, even after controlling for demographic, geographic, and symptom severity variables. Childhood participation in outdoor activities and sports is correlated with better coping abilities, stronger social relationships, and overall better health and well-being as adults (Lovelock et al., 2016). Allowing children to explore and make frequent contact with nature helps them develop critical life skills in a more natural manner than teaching them these same concepts in artificial environments (Buchan, 2017). For example, fostering children’s relationships with nature also helps them develop empathy, which can generalize to other domains, such as empathy for people (Acar & Torquati, 2015).

The more time children spend outdoors, the better they are able to manage their stress and cope with upsetting situations and events (Samborski, 2010). Even visual engagement with nature positively affects blood pressure, heart rate, and the immune system among both children and adults (M. Lee et al., 2018). There are also academic
benefits associated with time spent in nature, specifically, children who have frequent contact with nature are able to concentrate more easily and tend to be more self-disciplined, resulting in better academic achievement (Bird, 2007). Not only does nature significantly impact children’s attentional capabilities by reducing inattentiveness and off-task classroom behaviors, but also helps them regulate their emotions, which improves their overall classroom and learning experience (M. Lee et al., 2018).

**Connection to Nature.** Connectedness to nature can be defined as “individuals’ experiential sense of oneness with the natural world” (Mayer & Frantz, 2004, p. 504). Connectedness to nature is a relatively stable trait, but can also fluctuate in different states (Capaldi et al., 2014). However, much of the research treats connectedness to nature like a personality trait (Capaldi et al., 2014; Howell et al., 2011; Mayer & Frantz, 2004; Mayer et al., 2009). Connectedness to nature has been associated with the Big Five personality traits; people with a stronger connection to nature are also typically more extraverted, agreeable, open, and conscientious (Capaldi et al., 2014).

Connectedness to nature is one of the strongest predictors of ecological attitudes and behaviors, and was deemed by Otto and Pensini (2017) as a pre-requisite to sustainable behaviors. In the study conducted by Otto and Pensini (2017), they found that connectedness to nature had a significant effect on ecological behavior, accounting for 69% of the variance as seen in the test of the structure equation model. Adults with stronger feelings of connectedness to nature spent more time in nature as children, indicating that this innate desire to connect with nature can also be shaped by upbringing and environmental factors (Capaldi et al., 2014).
Moreover, Howell et al. (2011) found a significant correlation between nature connectedness and psychological and social well-being that was consistent across all three measures used, indicating that those who are more connected to nature also have better mental health and social lives. However, the relationship between nature connectedness and emotional well-being yielded inconsistent results, and a weak relationship was found at best (Howell et al., 2011). The work of Mayer et al. (2009) also investigated relationship between nature and well-being. Mayer et al. (2009) conducted a series of three studies in order to investigate which variables mediated the benefits from exposure to nature, and found that connection to nature had the strongest impact on well-being.

Capaldi et al. (2014) also found a small, but significant, effect between nature connectedness and happiness, which paralleled the results of similar studies. This study indicated that strong feelings of connection to nature was associated with higher levels of happiness (Capaldi et al., 2014). In addition to well-being, connection to nature has also been associated with autonomy, growth, sense of purpose, positive affect, vitality, and life satisfaction (Capaldi et al., 2014; Howell et al., 2011; Mayer & Frantz, 2004). Furthermore, connection to nature has also been associated with improved physical health, which increases well-being and protects against several physical and mental illnesses (Howell et al., 2011).

**The Impact of Connection to Nature on Child Development.** Nurturing, caring relationships are critical to healthy child development and while emphasis is on the primary caregiver and important adults in the child’s life, these caring relationships can be broadened to include other aspects of the child’s ecological system, including the

Connection with the natural environment is important for children’s healthy development (Greenleaf et al., 2014). Spending more time in nature has been linked to improved cognitive, emotional, and moral development (Adams & Savahl, 2017b; Greenleaf et al., 2014). Additionally, children who spend more time in nature are less likely to have mood disorders and conversely, spending more time indoors may worsen symptoms (Greenleaf et al., 2014). The specific cognitive benefits afforded by frequent contact with nature include better problem solving skills, self-efficacy, self-discipline and improved overall cognitive functioning (Cheng & Monroe, 2012).

Educating children in nature, such as through guidance lessons, provides them with opportunities to learn how to care for themselves, their peers, and for plants and animals in meaningful ways that are not afforded when indoors (Carter, 2016). This also echoes the notion of the ecological circle described by Clinebell (1996). The ecological circle is an interconnected and interdependent relationship between humans and the natural environment (Clinebell, 1996). By bringing children out into the natural world, an opportunity is created to not only help them connect with nature, but to reinforce this reciprocal relationship. Thus, an educator or school counselor can help children learn how nurturing nature will in turn nurture us, and help ensure that human life will continue on this planet. Bringing children into the natural environment not only benefits them, but may benefit future generations and the planet.
The benefits of being in nature also include the development of social-emotional competencies, which are vital to positive outcomes interpersonally, academically, and socially, and is the emphasis of many school counseling programs (Carter, 2016). Empathy is necessary in learning to care for others, and is one component of social-emotional competence. Frequent exposure to nature helps children develop empathy for the environment, which can generalize to empathy for others, positive self-concept, independence, improved well-being, and overall better life satisfaction (Cheng & Monroe, 2012). Other social-emotional competencies can also be enhanced through developmentally appropriate activities done in nature (Carter, 2016). Therefore, all guidance lessons used in this study were developmentally appropriate, as guided by the ASCA (2012) framework. Based on these findings, spending more time outdoors is not a luxury or a mere preference, it is a vital component of children’s healthy development and functioning (Wells & Evans, 2003).

**Ecotherapy in the Schools**

Even though a relationship with nature is vital for children, they are spending less and less time outdoors due to societal changes, parental fears, limited opportunities at school, and the rise of technology (Bird, 2007). Over one half of the entire world’s population already lives in an urban area, with projections for one third of the population by 2050, which significantly reduces exposure to the natural world and opportunities to engage with nature (Markevych et al., 2017). Furthermore, many public schools are not geographically situated in areas that are conducive to nature-based learning or activities, which has only served to create even more distance between children and nature (Rivkin, 1997). Some classrooms do not even have windows, which has been linked with
significant academic difficulties and failures, compared to students in classrooms with
natural light (Heschong Mahone Group, 2003). Specifically, students with natural light
progressed 20% or more quickly on math and reading measures than students who did not
have natural lighting in the classroom (Heschong Mahone Group, 2003).

Now that information is more easily and readily accessible than ever, children are
able to learn about global issues such as endangered animals in Africa, or the drought
crisis in California, but they have little personal experience with the natural environments
they live in (Allen, 2013). Bird (2007) recommends that government and schools should
encourage students to spend more times in nature, such as through outdoor lessons where
students can access green space and vegetation. Maller (2009) asserted that children are
naturally more drawn to nature in late childhood, or about five to 12 years old, which
makes elementary school an ideal place to implement these nature-based experiences.
Furthermore, the responsibility of providing children opportunities to interact with nature
is typically put on schools because many children in cities don’t have regular access to
nature at home, and they spend most of their day in school (Maller, 2009). As more
research comes to light showing the positive benefits from contact with nature, more and
more schools are trying to overcome their nature deficit by incorporating projects aimed
at exposing children to nature and/or wildlife, such as school gardens, sundials, tree
planting, and composting (Rivkin, 1997).

Data from many recent studies have found that nature-based activities in school
improved student motivation and concentration, improved student relationships with
school staff, and increased students’ ability to generate complex ideas and sustain
conversations (Flom et al., 2011). Teachers also see these benefits and consistently rated
classroom behaviors more positively after students have had recess or a nature-based activity (Swank & Swank, 2013). There are also significant emotional benefits, such as those found Chawla et al. (2014) that access to green space during recess for elementary school students reduced stress, anxiety, depression, anger, and problem behaviors, helped foster the protective factors needed for resilience, and improved overall mood. In a similar study, M. Lee et al. (2018) found that horticultural activities helped elementary school children improve their communication and interpersonal skills. Furthermore, the children who participated in the horticultural activities had a significant decrease in stress levels compared to the control group, as evidenced by salivary cortisol concentrations (M. Lee et al., 2018).

Research supports that children, adolescents, and young adults all learned better and showed higher levels of motivation when taught in an outdoor environment (Scott, Boyd, & Colquhoun, 2013). However, many teachers are either reluctant or unable to conduct their classes outdoors, even though they recognize the potential benefits of doing so (Scott et al., 2013). Many teachers expressed concerns about losing control over students and losing their expert status, or being exposed for lack of knowledge about the environment (Scott et al., 2013). To investigate the issue, Maller (2009) conducted a study to determine to educators’ perceptions about children’s contact with nature during schools and the perceived benefits. Maller (2009) found that educators believed there is great value and benefits from nature-based activities for children’s mental health, with many believing structured activities would be most beneficial. Educators believed that nature-based activities can cater to all types of learning styles and will improve students’ sense of achievement, self-confidence, self-esteem, stress level, creativity, connection to
others, empathy and caring, and engagement with the school (Maller, 2009). Therefore, this is a discrepancy between educators’ beliefs about the utility of nature-based learning and the reality of its implementation (Maller, 2009; Scott et al., 2013).

**The Role of the School in Access to Nature.** There has been an increasing interest in nature-based schools, lessons, and activities in the United States since the early 2000s (Larimore, 2016). There were only three licensed nature-based preschools in the United States prior to 2000, but currently there are about 30, indicating the significant growth that has happened in a relatively short time frame (Larimore, 2016). Nature-based education is increasing in popularity not only in the United States, but among countries throughout the world (Erdoğan, 2011). Currently, there is a movement in the United Kingdom known as the Forest School movement, which promotes regularly scheduled outdoor time, and research has shown that these schools have improved academic success, psychosocial functioning, social skills, and self-confidence (Flom et al., 2011).

Erdoğan (2011) asserted that it is important to engage children with the natural world from an early age, because if they begin to develop this relationship later on its strength and benefits will be inhibited. However, the increasing pressure on schools from legislatures to spend more time on academic instruction and test preparation directly contradicts the empirical evidence that children need more outdoor time in order to boost academic performance and classroom behavior (Flom et al., 2011). These pressures have forced schools to reduce the time allotted for recess and physical education, and some schools have had to cut electives such as art and music programs in order to spend more time focusing on academic instruction related to standardized tests (Flom et al., 2011).
A study conducted by the Robert Wood Johnson Foundation (RWJF, 2010) revealed that elementary school principals not only support outdoor recess, but believe it helps students academically, socially, and developmentally. However, nearly half of the nation’s schools have reduced or eliminated recess time (RWJF, 2010). The reduction or elimination of recess stands in stark contrast to empirical evidence showing that children who spent more time outdoors actually behaved better and learned more in the classroom (RWJF, 2010). Ironically, mandated testing was cited as the main reason for reducing the amount of recess time, so teachers could spend more time on academic instruction preparing students for testing (RWJF, 2010). Even though over 80% of principals believed in the importance and value of recess, the majority also reduced or eliminated recess as a punishment for problematic student behavior (RWJF, 2010). Therefore, with such significant reductions in recess and physical education, bringing guidance lessons or classes outdoors can provide children with a much needed opportunity to get outside.

In addition to the mental and emotional benefits of spending time in nature, being outside also affords children with more opportunities to get active, which lowers the risk of various physical diseases and obesity (Bürgi et al., 2016). Bürgi et al. (2016) found that children spend about nine hours a day sitting or otherwise being sedentary, which is a fairly radical departure from previous generations. The majority of those hours are spent sitting in classrooms and at school, which further highlights the importance of providing children with more opportunities to get outside during the school day (Bürgi et al., 2016). Furthermore, children from lower socioeconomic backgrounds spend more time being sedentary compared to higher SES peers, and also spend more time inside on electronic devices (Bürgi et al., 2016).
Even children from higher SES families spend more time inside being sedentary when they live in a low SES or disadvantaged neighborhood (Bürgi et al., 2016). This social effect may subsequently effect an entire school’s culture, because the specific public school a student attends is determined by their geographic location, or zone. While Bürgi et al. (2016) found that students from a higher SES family spent more time overall doing physical activity due to more access to recreational facilities, the majority of physical activity for all students was done outdoors at school, such as on the playground or field. The findings from this study indicate that students from low SES families do not have many opportunities outside of school to be in nature or engage in physical activity (Bürgi et al., 2016). Thus, it is especially critical for low SES schools to provide students with more opportunities to spend time outside.

Although nature provides restorative benefits, it may also provoke fear and discomfort in people who are disconnected from nature, such as inner-city children who do not have many opportunities to engage with the natural world, much like the students who participated in this study (Nadkarni et al., 2017). Spending more time in nature allows for a deeper connection to nature to be made, which these students may be lacking. In order to address these students’ potential fears and to reduce their anxiety, the researcher explicitly addressed common fears, such as insects, and asked students to share their concerns (anonymously). The exact protocol for eliciting student feedback is outlined in the methods section.

The School Counselor. M. Lee et al. (2018) asserted that “the objective of school education is to provide children with a holistic education so that they can acquire knowledge, virtues, and skills that are required to live as human beings…” (p. 172)
School counselors contribute to students’ holistic education by working to remove barriers to academic success for all students and maximize their potential, which can include more contact with nature (Flom et al., 2011). Guidance lessons in the areas of academic, personal and social, and career domains are part of the responsibility school counselors have in implementing a comprehensive school counseling program (ASCA, 2012; Flom et al., 2011). Guidance lessons can easily be taken and conducted outdoors, weather permitting, and still follow the ASCA (2012) standards and school expectations (Flom et al., 2011).

Additionally, providing targeted guidance lessons for certain student groups may be especially beneficial; such as relating nature to career development for girls, who are significantly underrepresented in natural science and outdoor careers (Flom et al., 2011). There are other ways to incorporate nature into a comprehensive guidance program, such as the example set by one elementary school, where the school counselor targeted children with behavioral issues for a structured recess program and effectively reduced their discipline slips to zero (Flom et al., 2011). Furthermore, school wide discipline referrals dropped by more than 36% the year after nature-based structured recess and classroom lessons were implemented (Flom et al., 2011).

Montessori (1996) highlighted the importance of educating children in the natural world by saying, “When the child goes out, it is the world itself that offers itself to him. Let us take the child out to show him real things instead of making objects which represent ideas and closing them in cupboards.” (p. 18). The positive impact of school based outdoor activities has been demonstrated on a wide variety of student demographics, including those with severe behavioral and mental issues, learning
disabilities, those with no identified issues, varying socioeconomic statuses, diverse ethnicities, and across age groups (Flom et al., 2011). Nature provides children with many benefits, but is also an important component of their subjective well-being (Adams & Savahl, 2017a). With children spending the majority of their time in schools, educators have an opportunity to improve their students’ quality of life by providing them with more time spent in nature (Adams & Savahl, 2017a).

Research has generally focused on three ways of making contact with nature: visual, physical presence, and active participation (Burls, 2007). Active participation can be conceptualized as working directly with nature, such as gardening, or the use of natural mediums in education (Burls, 2007). Swank and Swank (2013) have recommended the implementation of a school garden program to support student engagement with nature and experiential learning. The school garden program may be created with a social-emotional focus, rather than the typical emphasis on scientific knowledge, aimed at developing life skills and thus more applicable to school counselors (Swank & Swank, 2013). Whatever the specific intervention, there is a need for school personnel to conduct their own mental health services and programs, because most of the research done in schools was conducted by an outside professional under atypical conditions (Sanchez et al., 2018). Therefore, the school counselor is in an optimal position to work with staff, and to provide these services to students whose needs they are already familiar with.
**Guidance Curriculum.** The guidance curriculum being utilized in this study is the Promoting Alternative Thinking Strategies (PATHS), which is a comprehensive curriculum that was developed to address many social emotional competencies and improve academic outcomes for students (Chi-Ming, Greenberg & Kusché, 2004). The PATHS program incorporates a variety of approaches, is developmentally appropriate with lessons for each grade level, emphasizes emotional development, provides training for implementation, and utilizes multiple measures to assess effectiveness (Chi-Ming et al., 2004). The focus of the PATHS program is on emotion regulation and awareness, in order to empower students to become better problem solvers, decision makers, and to help with healthy emotional development (Chi-Ming et al., 2004). Furthermore, the PATHS program is preventative in nature and assumes that the school is an ideal environment for positive change (Chi-Ming et al., 2004).

Specifically, the PATHS program is based on the affective-behavioral-cognitive-dynamic (ABCD) developmental model (Chi-Ming et al., 2004). The ABCD model contends that emotion precedes cognition, and children’s coping abilities are a reflection of their emotional awareness, behavioral skills, affective-cognitive control, and social-cognitive understanding (Chi-Ming et al., 2004). Therefore, the PATHS program is intended to help students achieve self-control, emotional awareness and understanding, social problem solving, and increased social emotional competence (Chi-Ming et al., 2004). The four assumptions the PATHS program is based on are: children’s ability to understand and verbalize emotions is related to communicative development and the ability to show self-control; children’s ability to manage, understand, and verbalize emotions are subject to developmental constraints and socialization; children’s ability to
understand their own emotions and those of others is central to social problem solving; and the school environment is a fundamental ecology that can be a central focus of change (Greenberg & Kusché, 2006).

Several studies of the PATHS program have found significant improvements in emotional understanding, ability to verbalize and manage emotions, classroom atmosphere, and a decrease in aggressive and disruptive behaviors in both general and special education classes (Chi-Ming et al., 2004; Crean & Johnson, 2013; Domitrovich, Cortes, & Greenberg, 2007; Gibson, Werner, & Sweeney, 2015; Greenberg, Kam, Heinrichs, & Conduct Problems Prevention Research Group, 2003; Greenberg, Kusché, Cook, & Quamma, 1995; Humphrey et al., 2016). Crean and Johnson (2013) investigated the effects of the PATHS program on the developmental trajectory among third grade students and found significant improvements in aggression, conduct problems, acting out, and disruptive behaviors. Third grade students were chosen purposefully because of the potential for huge developmental gains, and were monitored for two years while participating in the PATHS program (Crean & Johnson, 2013). While the present study did not monitor students for two years, third graders were purposefully chosen because developmentally they are beginning to be able to verbalize their inner thoughts and feelings, and yet are young enough that significant developmental gains can be made through intervention programs (Crean & Johnson, 2013).

Gibson, Werner, and Sweeney (2015) evaluated the effectiveness of the PATHS program when adapted to be implemented by a licensed psychologist and dosage was adapted to less than half of the total lessons. Furthermore, the lessons were implemented once per week for 30 minutes, instead of the suggested twice or more per week.
implementation (Gibson et al., 2015). Even with the reduced dosage, the results of this study show that students had significant increases in prosocial behavior, and problem behaviors were reduced (Gibson et al., 2015). These findings add support to the implementation of the current study, which also adapted the dosage. The PATHS third grade curriculum is composed of 42 total lessons across nine units, but only six lessons from unit three, were included in the study. Additionally, these lessons were implemented once per week, instead of the PATHS recommendation of twice per week. However, while only six lessons were used, the students receive a total of 30 lessons throughout the school year, implemented once per week by the primary school counselor. The students do not receive the full 42 lessons because the school year is only 36 weeks long (of time spent at school), and because of practical constraints such as mid-week breaks and half-days for testing and conferences.

The PATHS program is an ideal intervention for elementary school students because it is focused on prevention, which is a national priority among schools and education officials (Humphrey et al., 2016). Furthermore, children spend over 30 hours per week at school, not including time possibly spent in before and after care or extracurricular activities, making schools a central aspect in the lives of both children and their families (Humphrey et al., 2016). Prevention programs delivered in elementary schools are particularly important because they have been linked to long term gains such as better health, well-being, and quality of life (Humphrey et al., 2016). Since the PATHS program is preventative, can be implemented by teachers or the counselor, is developmentally appropriate, widely used, empirically supported, and targets elementary
school children, it is an appropriate choice for this study. The PATHS program also supports the ASCA National Model (2012), which will be discussed in detail.

**The ASCA National Model.** The ASCA National Model (2012) helps schools and districts establish the school counseling program as a vital part of student curriculum, ensure the delivery of a comprehensive school counseling program, and identify and teach the skills should acquire (American Counseling Association [ACA], 2003). Furthermore, the program ensures equitable access to education for all students, is delivered systemically, is based on student and empirical data, and is implemented by a licensed school counselor (ASCA, 2012). The ASCA National Model (2012) is a framework for a comprehensive school counseling program that supports academic, career, and social development, and also provides school counselors with a way to validate the effectiveness of their practices. According to ASCA (2012), a comprehensive school counseling program involves the other educators at the school and the parents, in addition to the students they are serving, in order to create an environment focused on student success and achievement. Therefore, school counselors are also members of the educational team and an integral part of student achievement, including academic achievement (ASCA, 2012). In order to help students most effectively, all comprehensive school counseling programs have the following components: foundation, management, delivery, and accountability (ASCA, 2012).

The foundation of the program sets the focus, which can be done by creating a vision or philosophy statement for the counseling program that focuses on student outcomes and competencies (ASCA, 2012). The specific student competencies to be addressed are outlined in the ASCA Mindsets and Behaviors for Student Success and
cover the areas of academic, career, and social emotional development (ASCA, 2012). The PATHS program supports the development of these competencies by explicitly linking each lesson to the ASCA (2012) competencies that will be taught (Channing Bete). The specific ASCA National Standards for Students (2012) that will be addressed through the lessons taught in this study can be found in Appendix A (Channing Bete Company, 2018). A complete list of all ASCA National Standards for Students (2012) can be found in Appendix B.

Additionally, there are professional competencies every school counselor should possess in order to meet the needs of students, the school, and to make ethical decisions with integrity (ASCA, 2012). School counselors need leadership and organizational skills to effectively manage and assess the school counseling program (ASCA, 2012). ASCA (2012) recommends the use of program and use-of-time assessment tools, advisory councils that include students, parents, and teachers, active use of school and student data, and developing action plans to address achievement gaps. Keeping track of how time is utilized throughout the day can help prevent school counselors from taking on inappropriate roles, such as disciplining students, keeping clerical records, conducting testing, and other duties outside the role of school counselor (ASCA, 2012). Additionally, by using assessments and data to evaluate the effectiveness of the school counseling program, it will be easier to see what is working well and what needs to be improved upon (ASCA, 2012).

The delivery of the comprehensive school counseling program is where school counselors spend most of their time and should comprise about 80% of the program (ASCA, 2012). Delivery addresses services that are provided to students, parents, school
staff, and the community (ASCA, 2012). Students receive services such as individual student planning, responsive services, and direct and indirect services (ASCA, 2012). Student planning helps students establish goals and develop plans, responsive services address immediate student needs and crises, indirect services can include activities such as referrals and consultations, and direct services are delivered in-person, such as the delivery of the school counseling curriculum (ASCA, 2012). The aims of the present study focus on direct services by means of delivering structured guidance lessons that help students achieve the ASCA (2012) student competencies.

Guidance lessons are a critical component of the comprehensive school counseling program, and must be delivered in a developmentally appropriate way (ASCA, 2012). It is also expected that guidance lessons are well planned and conducted on a regular basis in order to provide all students with the knowledge and competencies they need to help them develop socially, emotionally, and academically (ASCA, 2012). The importance of guidance lessons is also reflected in the findings of Palmer and Erford (2012), who found that students receiving lessons in accordance with the ASCA (2012) program had improved math and English scores, higher graduation rates, and better attendance rates. Therefore, the PATHS program is a suitable choice for guidance lessons because it was developed with students’ unique developmental stages in mind and informed by empirically supported data (Greenberg et al., 1995).

Lastly, accountability is an integral aspect of all schools for educators, administrators, and school counselors. It is important that school counselors provide the school with data to support the effectiveness of the school counseling program by utilizing measurable outcomes to demonstrate the impact of the program (ASCA, 2012).
These assessments help guide the school counseling program in the future by clearly highlighting success and areas to be improved (ASCA, 2012). Furthermore, school counselors’ performances are routinely evaluated, and this data can lend support and insight to how they are performing (ASCA, 2012).

**Review of Related Studies**

The findings of several studies conducted within schools have shown promising results for the effectiveness of nature-based interventions, ranging anywhere from four days to 12 weeks in length, with one session per week. For instance, Swank et al. (2017) found that a six-week nature-based intervention implemented at an elementary school improved ADHD symptoms including focusing, following directions, and completing tasks. Similarly, Bazzano, Anderson, Hylton, and Gustat (2018) found that after only eight weeks, third grade students with identified anxiety who participated in a mindfulness based intervention showed significant increases in both psychosocial and emotional quality of life. With the addition of just one week, M. Lee et al. (2018) found at the end of a nine-week program that elementary school children who participated in horticultural activities had significantly reduced stress, and improved communication and interpersonal skills. The findings of these studies lend credible support for the implementation of a six-week long school based program.

Furthermore, FRIENDS for Life is a school based program for children aged four to 11 that aims to prevent anxiety and depression based on Cognitive Behavioral Therapy (CBT) principles (Kösters et al., 2017). FRIENDS for Life has been well informed by research throughout its development, and there have been several studies conducted on the effects of program (Kösters et al., 2017). To date, all studies conducted have reported
that a positive and significant impact was made on anxiety and depression, reducing symptoms and severity (Kösters et al., 2017). The main program consists of 10 sessions and there are two “booster” sessions (one and three months after program completion) for a total of 12 weeks (Kösters et al., 2017). The proposed length of intervention for this study was six weeks, just four sessions shy from the main program of a thoroughly tested and effective treatment for anxiety among elementary school students.

Similar studies have been conducted with elementary aged children, but were not implemented in a school. However, two of the studies presented found significant results after just 12 days and six-weeks, whereas one of the studies did not have a significant effect on anxiety (Erdoğan, 2011; Kuo & Taylor, 2004; Jessee, Strickland, Leeper, & Hudson, 1987). Kuo and Taylor (2004) found that after six weeks of activities conducted in natural environments, there were significant improvements in ADHD symptom severity among school aged children, even after controlling for demographic, geographic, and symptom severity variables. Remarkably, Erdoğan (2011) found that after a mere 12 day participation in a nature-based program, elementary students’ responsible behaviors and affect were significantly improved.

Jessee et al. (1987) conducted a study on participation in one of four nature-based activities including potting a plant, making a collage, painting an outdoor scene, and weaving with natural objects, but did not significantly reduce anxiety more than indoor activities among hospitalized children. However, although these activities actively involved aspects of nature, they all physically took place indoors (Jessee et al., 1987). Therefore, it seems that physical presence in nature was a critical component of the
results that found positive effects, providing rationale for conducting the lessons outdoors, rather than bringing elements of nature inside.

Broadening the scope to include adolescents, Farnham and Mutrie (1997) found that after only four days of nature-based activities, there was a significant reduction in tension and anxiety among participants aged 13-17, as evidenced by scores on the Profile of Mood States (POMS). The activities participants engaged in were primarily walking and hiking outdoors (Farnham & Mutrie, 1997). The teachers also noticed improvements among the students, reporting increases in students’ self-confidence, relaxation, enjoyment, and group cohesion (Farnham & Mutrie, 1997). Furthermore, Barton and Pretty (2010) conducted a comprehensive meta-analysis on studies using nature-based interventions across age groups and found medium effects ($d=0.46; d=0.54$) after 10-60 minutes of exposure to green space on self-esteem and mood, respectively (Barton & Pretty, 2010). Based on the positive impacts made in such a short period of time, 30-minute guidance lessons, delivered once a week for six weeks, should be sufficient to produce an effect.

**Summary**

Currently, we live in environments that are not ideally suited for minds that developed and evolved in significantly different environments; early humans needed to live meaningfully and in harmony with nature to survive (Capaldi et al., 2014). For the first time, people are spending the vast majority of their time indoors, children are spending less time outside than any generation before them, and more people than ever are living in urban areas (Capaldi et al., 2014). This departure from nature directly contradicts Roszak et al.’s (1995) bold assertion that autonomy from the earth is an
illusion because we are connected to all life on the planet and we are fundamentally of one being. If that is so, it is not only the earth that will be in jeopardy if children lose this connection, all life and existence on earth will also be in danger.

Decades ago, Ulrich et al. (1991) observed that patients recovering from surgery who had views of trees recovered faster, had better interactions with nurses, and used fewer medications, sparking important curiosity on the role nature plays in health. Building on the work of Kaplan and Kaplan (1989), years later Bird (2007) concluded that the symptoms of attention fatigue parallel the symptoms of ADHD, such becoming easily distracted, planning impairment, impulsive behavior, and irritability, which lent further support to nature’s vital role in human health. Unfortunately, literature on applying nature-based interventions is scant, but building off of earlier works, researchers have found that nature offers numerous benefits that are not afforded by traditional indoor counseling (Berger & Tiry, 2012; Reese, 2016).

Increasing positive ecological knowledge, attitudes, and behaviors is critical to the health of the planet, which in turn is critical to the survival of humans (Otto & Pensini, 2017). Rivkin (1997) indicated that humans have made a “radical departure” from the natural environments we have evolved in, as we move to more and more urbanized environments disconnected from nature. Hillman (1992) powerfully illuminated this disconnect experienced between humans, the natural world, and our basic instincts:

An analyst sitting in his chair all day long is more aware of the faintest flickers of arousal in the seat of his sexuality than of the massive discomfort in the same seat brought by the chair: its wrongly built back, its heat-retaining fabric, its resistant upholstery and formaldehyde glue. His animal sense has been trained to notice
only one set of proprioception to the exclusion of the psychic reality of the chair.

A cat knows better. (p. 114)

Thus, the importance of utilizing ecotherapy as a modality to reconnect children to the
natural environment cannot be understated. In order to increase sustainable behaviors and
positive attitudes toward the natural environment, it is important that children are
presented with opportunities to spend time outside (Bird, 2007). Adult attitudes toward
nature are shaped by their experiences as children, and children spend most of their time
in school, which is why schools are in an ideal position to foster these opportunities (Otto
CHAPTER III: METHODS

Introduction

This study assessed the potential benefits of participation in nature-based guidance lessons among third grade elementary school students. The students were tested on measures of anxiety and connection to nature both one week before and one week after the intervention. It was hypothesized that the students participating in nature-based guidance lessons would experience less anxiety and more connection to nature. The pre-test and post-test were administered to all participants by the primary researcher, and the classroom teacher was also present to help manage the students. The assessments were conducted by classroom; only one classroom at a time was assessed during the same time guidance lessons were scheduled for. The sample was selected out of convenience; a school counselor with whom the primary researcher had an existing relationship with was selected for the study. The school also has access to a green field where the guidance lessons could take place, a key necessity for the study. Four third grade classes participated, which comprises the entire grade level, and each class was randomly assigned to experimental or control conditions. The remainder of this chapter outlines the rationale for the chosen design, the school setting, participant information, sampling procedures, data collection, specific measures used, procedures, and the limitations and delimitations.

Design

This study employed a pre-test post-test control group design, also known as the classic controlled experimental design (Spector, 1981). One of the main advantages of this design is the ability to demonstrate scores on the dependent variables both before and
after the intervention, and is a popular design in educational and mental health research (Spector, 1981). However, the pre-test will create the potential threats of instrument reactivity and regression to the mean (Spector, 1981). Instrument reactivity occurs when participants become sensitized to the measures by taking the pre-test and it alters their post-test scores (Spector, 1981). For instance, perhaps the students will recall certain aspects of the anxiety or connection to nature measures, and wish to answer differently on the post-test, even if it is not the most accurate or truthful response. Regression to the mean can become problematic when there are extreme scores or outliers, as these are frequently due to error rather than being an accurate measure of the construct (Spector, 1981). Since chance plays a role in scoring, especially in extreme scores, it is likely that post-test scores would regress more towards the mean, which would look like real change, but in fact could be due to error (Spector, 1981).

In order to conduct the most rigorous study possible, Spector (1981) recommends using the pre-test scores to compare the groups for equivalence at baseline. If groups are equivalent on the measures before the intervention, the post-test scores should thus reflect real differences (Spector, 1981). A between groups t-test was used to assess differences between groups at baseline (one test for each measure) to ensure that scores between groups were equivalent at the start of the study. This study used two mixed Analysis of Variance (ANOVA) to analyze the results, which examined the between groups factor of treatment condition and the within groups factor of time. The within groups variable was experimental condition, the between groups variable was time (pre- and post-test), and the dependent variables were anxiety and connection to nature. A two-way mixed ANOVA was used for each dependent variable.
Participants and Setting

A minimum sample size calculation was conducted using an a priori power analysis by the statistical program g*power in the F tests family for ANOVA: fixed effects, special, main effects, and interactions. A sample of 52 participants was needed for a large effect size ($f=0.4$), power level of 0.8, and two groups. This study initially included 61 participants in total, out of 70 students total enrolled in the third grade, but one student in the control condition un-enrolled during the first week of the study, for a total of 60 participants, or 86% of the third grade, were in this study. Furthermore, two students enrolled during the study, but they were excluded so as not to confound the results by participating only partially in the study. The school was located in a primarily Hispanic, low-income neighborhood of a major city in the northwest region of the United States. The demographics of the students included were as follows; 72.13% Hispanic or Latinx (non-white), 22.95% White, 6.56% American Indian or Alaska Native, 3.28% Black or African American, 1.64% Native Hawaiian or Pacific Islander, and 1.64% Asian; 59.02% of students were male and 40.98% female; 50.82% were nine years old, 45.9% were eight years old, and 3.28% were 10 years old. Demographic information was further broken down by treatment condition; in the experimental condition there were 34 students in total representing the following demographics, 73.53% Hispanic or Latinx, 20.59% White, 8.82% American Indian or Alaska Native, and 2.94% Black or African American; 52.94% of students were male and 47.06% were female; 52.94% were nine years old, 44.12% were eight years old, and 2.94% were 10 years old. There were 26 total students in the control condition representing the following demographics; 70.37% Hispanic or Latinx, 25.93% White, 3.7% American Indian or Alaska Native, 3.7% Black
or African American, 3.7% Native Hawaiian or Pacific Islander, and 3.7% Asian; 66.67% were male and 33.33% were female; 48.15% were eight years old, 48.15% were nine years old, and 3.7% were 10 years old. The groups were equivalent among all demographic information except for sex, the control condition had a much higher percentage of males, but the experimental condition also had more males.

The particular school selected for the study was chosen out of convenience by a pre-existing professional relationship with the school counselor at the chosen school. Also of relevance, the particular school has access to a large open field where lessons could be conducted. Based on the recommendation of Barton et al. (2015) that open spaces such as fields are preferable, a school with specific geographic features was necessary. The school chosen had a large field and is one of the few schools with significant access to greenery. For those reasons, a single school was chosen for this study.

**Sampling**

As mentioned, convenience sampling was employed in the initial selection of the school, by reaching out through email to a colleague. Because this study required teachers to give up an extra period in their day once a week, all teachers were informed of this feature and agreed to participate. There were only four classes in all of the third grade, therefore this study included the entire third grade at the school. The classes were randomly assigned to experimental or control conditions using a coin flip. A result of heads was used for experimental and tails indicated control.

Due to the nature of the study, it is possible that a negative bias was introduced to the control group because of jealousy about the experimental group getting to go outside.
Students tend to look forward to outdoor time, so they may have felt jealous or resentful that other classes were receiving guidance outside. In order to control for this potential bias, students were taken outside using a side exit, to minimize the chance that they would pass other classrooms on their way out. Additionally, the windows in the classrooms were at the top of the wall, which lets light in, but did not allow students to see outside. Therefore, students were not able to see the classrooms receiving nature-based guidance lessons while they were outside or leaving.

To further protect the integrity of the study, teachers also attended a brief training administered by the primary researcher, to ensure that everyone received the same information on how to talk to students about the study and avoid biasing them. Teachers were asked not to say anything negative about the study in general, with emphasis that they do not say anything negative about having to stay inside. Since the students typically receive guidance indoors, there should be nothing out of the ordinary, aside from a different counselor delivering the lessons. For the students who received outdoor lessons, they were asked to write any concerns they have about being outside anonymously on an index card one week before the intervention began. Index cards were then collected by the primary researcher so that concerns and fears could be addressed before the study commenced, and were done anonymously so as not to embarrass or shame the students. The concerns presented by students on the index cards were addressed to the entire class.

**Data Collection**

First and foremost, permission was obtained from University of Nevada, Reno’s Institutional Review Board (IRB) to employ all data collection methods used, tests administered, and to obtain parent or guardian permission and student assent. The IRB
approval form can be found in Appendix C. Data was collected at two points in time, one week immediately before the intervention and one week after. The primary research administered the tests, and the classroom teacher and school counselor were also present to help manage the students. The pre-tests and post-tests were done by classroom (one class at a time) at the same time the guidance lessons had been scheduled for. The students were allowed to ask clarifying questions, such as the definition of a word, but were not given specific examples, nor were they permitted to speak to each other during assessment administration. Only the primary researcher answered questions, and the classroom teachers provided classroom management, such as making sure the students remained silent and seated. The Beck Anxiety Inventory for Youth (BAI-Y) was used to measure anxiety and the Connection to Nature Index (CNI) was used to measure connection to nature (Beck, Beck, & Jolly, 2005; Cheng, & Monroe, 2012). Once scoring was complete, scores were recorded by the researcher according to arbitrary student numbers, so that individual students could not be identified.

Measures

Beck’s Anxiety Inventory for Youth

The BAI-Y was developed with a theoretical foundation in cognitive therapy, informed by the Diagnostic and Statistical Manual of Mental Disorders (DSM) official diagnoses, and also by case studies from children receiving counseling (Bose-Deakins & Floyd, 2004). The BAI-Y measures fear, worry, and physical symptoms of anxiety (Bose-Deakins & Floyd, 2004). However, the inventory does not contain any subscales, nor do any of the other youth inventories, but instead is intended to be a general measure of childhood anxiety (Bose-Deakins & Floyd, 2004). The BAI-Y is a prolonged state
measure, meaning that it should not make a significant difference whether the child is just having an anxious day or not because the instrument assesses how they feel in general, with special attention paid to the past two weeks (Bose-Deakins & Floyd, 2004).

The Beck Youth Inventories consist of five self-report inventories in total, each with 20 statements written a second grade reading level scored on a zero to four-point scale (zero: never through three: always) and take roughly 10 minutes to complete (Steer, Kumar, Beck, & Beck, 2001). Each of the Beck Youth Inventories was standardized using a sample of 800 children from age seven to 14, representing all areas of the nation (Steer et al., 2001). All of the Beck Youth Inventories had high internal consistency, construct validity, and test-retest reliability coefficients, all of which exceeded the minimum of .8 (Bose-Deakins & Floyd, 2004; Steer et al., 2001). Specific to anxiety, the BAI-Y was correlated with scores from another known, valid instrument, the Revised Children’s Manifest Anxiety Scale (RCMAS), and was significant at the .01 level, indicating strong convergent validity.

Children complete the inventory by circling their response and there are clear written instructions on the response page (Bose-Deakins & Floyd, 2004). Furthermore, questions were clarified by the researcher, school counselor, or a classroom teacher as they arise. Once completed, the scores of each inventory can be converted into a standard t-score ($M=50, SD=10$) or a percentile rank to compare to the national sample (Bose-Deakins & Floyd, 2004). For the purposes of this study, no comparisons to national scores will be made because this study did not use the BAI-Y for therapeutic or diagnostic purposes. Based on the research, the BAI-Y is an effective tool for use with children in both group and individual settings that can be conducted fairly quickly,
making it ideal for a classroom setting (Bose-Deakins & Floyd, 2004). However, due to copyright restrictions, an exact reproduction of the measure could not be reproduced as part of this manuscript.

**Connection to Nature Index**

Cheng and Monroe (2012) developed a scale to measure children’s connection to nature in order to address many unanswered questions about the role that affect plays in pro-environmental attitudes and behaviors. The Connection to Nature Scale (CNS) was developed to measure “an individual’s affective, experiential connection to nature” (Mayer & Frantz, 2009, p. 504) and was found to be both reliable and valid in five different studies, but is intended for an adult population. The shared aspects of scales used to measure connection to nature in adults are sympathy, empathy, enjoyment, interest, experience, fear, and protection of nature (Cheng & Monroe, 2012). However, these concepts had not been operationalized or adapted in a manner appropriate for children, so Cheng and Monroe (2012) developed a scale with all of these elements, but adapted to be developmentally appropriate for children.

The Connection to Nature Index was piloted among five fourth grade classes in Florida in conjunction with student interviews, in order to determine appropriateness of the vocabulary used on the index (Cheng & Monroe, 2012). A total of 1,432 students were included in the development of the index, which was a representative sample of the school district’s demographics (Cheng & Monroe, 2012). The index consists of 18 items rated on a five-point scale and measures four separate constructs; enjoyment of nature, empathy for creatures, sense of oneness, and sense of responsibility (Cheng & Monroe, 2012). The initial reliability was $\alpha = .76$, but after redundant items were deleted reliability
increased to $\alpha=.87$ (Cheng & Monroe, 2012). Cheng and Monroe (2012) determined the scale is valid based on the positive correlations ($p<.01$) between scores on the index and variables empirically supported to measure affinity toward nature.

The Connection to Nature Index was developed for children aged eight to 10 and was used among fourth and fifth graders, whereas third graders will be participating in this study (Cheng & Monroe, 2012). Additionally, Bragg, Wood, Barton, & Pretty, 2013 found that the CNI was acceptable for use with children aged eight to 12. Third graders are between the ages of eight and nine, so while they still fall within the appropriate age range for the intended use of this measure, they are at youngest end of the spectrum. The complete measure can be found in Appendix D.

**Demographic Questionnaire**

A questionnaire including information on student demographics and participation in outdoor sports was used to gather information about age, sex, race or ethnicity, and engagement in outside activities. Dillman et al. (1993) contend that questionnaires need to be “respondent-friendly” (p. 290) especially concerning the length because participants will be less likely to respond to long forms, or will have more negative feelings about longer forms. Other aspects of the questionnaire to keep in mind are the instructions, wording of the items, and size of the paper being used (Dillman et al., 1993). In order to address these potential issues described by Dillman et al. (1993), the questionnaire being used in this study was printed on standard size letter paper, used child-friendly language, and only included questions necessary to the study. Furthermore, the researcher, the school counselor, and the classroom teachers were present to clarify any questions about the questionnaire while students were completing them. The final version, which can be
found in Appendix E, consisted of four questions relating to age, sex, race or ethnicity, and participation in outdoor activities.

Furthermore, special consideration was given to the response categories included in the list of possible outdoor sports and activities. Response categories not only provide information to the researcher, but also reflect the researcher’s knowledge about the category to the participant (Rockwood et al., 1997). Therefore, it is important to have a general idea of what outdoor activities the students participate in before constructing the possible responses to that question on the demographic questionnaire. This is an important consideration because students should be answering the question with information based on their real world experiences, rather than formulating a response based on what they believe the researcher or questionnaire wants (Rockwood et al., 1997). For the purpose of this study, the only response category utilized that was not related to general demographic information (sex, age, and race) was participation in outdoor activities. However, this information was ultimately not used as a covariate in the study because every student indicated participation in at least one outdoor activity.

**Delimitations and Limitations**

**Delimitations**

One specific school was chosen purposefully for this study based on expressed interest and the availability of open green space. Additionally, a study length of six weeks was decided as most appropriate based on both studies of a similar nature, and school needs. In order to be as least intrusive as possible, it was recommended by the school principal that the study conclude at least two weeks before the school year ends due to the many other events that take place during that time. The school counselor recommended
the study take place a few weeks after resuming school from winter break due to the chaos typically experienced after coming back from the holidays. This also allowed for more time to schedule all logistics. Based on these recommendations, the study ran from the last week of February through the first week of May, which included time for the pre-test, post-test, and spring break.

**Limitations**

Although a single school was chosen purposefully, it also limited the generalizability of the findings. The demographics of this school were primarily Hispanic and low-income. Furthermore, the physical space provided by the school was much richer than the outdoor spaces of many neighboring schools. However, even though there was a large field and visually pleasing natural area, children may still have experienced fear or phobias about being in nature. In an effort to control for these potential concerns, students were asked how they felt about going outside before the study began, and all fears were addressed. Due to the variance in results from different physical settings, the results of this study may not be applicable to other schools, even when following the same guidance lessons and procedures. The researcher conducted all of the guidance lessons, which may have inadvertently altered student behavior based on group expectations.

The design also presented some limitations, namely instrument reactivity and regression to the mean. While a pre-test gave the distinct advantage of measuring the outcome variable at both baseline and after intervention, it also created the potential to alter post-test scores based purely on exposure to the same test at baseline (Spector, 1981). Any extreme scores recorded initially were more likely due to error, which may look like real change as they regress towards the mean at post-test (Spector, 1981).
Additionally, the data was not analyzed as nested data, which has been suggested as an alternative measurement approach by some researchers to better account for the network structure of complex settings, such as a school (Condon, Lavery, & Engle, 2016).

**Procedures**

The school counselor and principal were contacted to discuss the acceptability of the proposed study. After both had agreed to it (Appendix F), the researcher and the school counselor determined the content of the guidance lessons to be conducted. In order to comply with national and district curriculum standards, the school counselor provided the researcher with the empirically supported guidance curriculum materials already being implemented at the school. Based on this curriculum, guidance lessons were chosen to cover topics requested by the teachers, all of which align with ASCA (2012) standards. Guidance lessons were exactly the same for students in both conditions. Due to copyright restrictions, the exact guidance lessons used could not be reproduced as part of this manuscript. However, the ASCA standards each lesson aligns with can be found in Appendix A. The lessons taught were on the topics of feelings, with each lesson covering one of the following topics (listed in the order they were taught): introduction to feelings, anger, calm and tense, guilt, jealousy, and a review of what was learned.

Classes were assigned to experimental and control conditions randomly, using a coin flip. The researcher and school counselor scheduled a time to conduct the guidance lessons with the teachers, which was the same time for every class on different days. Guidance lessons were conducted on Monday, Tuesday, Thursday, and Friday from 11 to 11:30am. This time was chosen specifically because it did not interfere with academic
time (students missed their elective, which was either a music or computer lesson) and because there were no recesses at this time, so no one else was on the field.

Students were notified of the study four weeks in advance. Active permission slips (Appendix G) were sent home to be signed and returned by all parents or guardians. In order to achieve maximum participation, the parents of students who had not returned permission slips after one week were contacted via telephone by the primary researcher to explain the study and request the slip be returned. This reached more families and increased the return rate significantly. Permission slips were kept in a secure location by the school counselor. Furthermore, student assent (Appendix H) was also collected prior to the pre-test. Any student that was not able to participate in the study joined another third grade class for the duration of the lesson and during assessment administration. All assessments were conducted indoors in the primary classroom for both groups. Students in the control condition received guidance lessons as they usually would, with the exception of a different counselor delivering the lesson.

The students in the experimental condition first discussed what the rules were before going outside, which were to stay with the group and to listen when someone else was speaking. Students were instructed to get to the field in whatever manner they prefer (walk, jog, run), but to stay seated once everyone was on the field. We sat in a circle in the middle of the field for lessons. Students typically raced (running) to the field and took approximately two to three minutes to settle down. Once the students were settled and ready to learn, they sat in a circle on the grass (including the researcher), nearly shoulder to shoulder. No blankets or seats were provided, but some students chose to sit on their sweatshirts or jackets instead of the grass. Since guidance lessons are part of the student
curriculum, it was important for everyone to sit close enough to hear. Once the guidance lesson was over, students lined up in the same manner they do when they come in from recess, which was to run or race to the fence, and then returned (walking) to their classroom.

The physical setting for the experimental group was a fenced in grass field, approximately the size of two soccer fields side-by-side. There were no trees, bushes, or obstructions on the field, but there were trees along the fence. The lessons took in place in the center of the field, in order to maximize the amount of green space surrounding the students. No other students were outside at this time, as there was no recess, physical education, or outdoor activities at this time, allowing the students unobstructed views of the green field.

**Data Analysis**

Based on the recommendation of Spector (1981), this study used two t-tests and two mixed ANOVAs to analyze the results. The t-tests were used to determine group similarity at baseline for both measures. A two-way mixed ANOVA was conducted to analyze the results for each measure, the CNI and the BAI-Y, to compare scores between groups and to analyze within group differences from the start to conclusion of the study. The between groups variable was treatment condition and the within groups variable was time (pre and post tests).
CHAPTER IV: RESULTS

The goal of this study was to explore connection to nature and levels of anxiety among third grade elementary school students in an urban school district located in a western state and examine whether nature-based guidance lessons impacted students’ connection to nature and anxiety. The methodology utilized was a quantitative design employing two independent samples t-tests and two mixed 2x2 ANOVAs. The two independent samples t-tests were used to determine whether groups were equivalent at baseline for both measures. The mixed ANOVAs were used to investigate the relationship between treatment condition and effect on connection to nature and anxiety scores, and the within groups effect of time on scores. A 2x2 mixed model with repeated measures was performed, with treatment condition (experimental and control) as the between subjects factor, and time (pre and post-test scores) as the within subjects factor, for each dependent variable (anxiety and connection to nature). This chapter presents the statistical findings of this study.

Introduction

The Beck’s Anxiety Inventory for Youth (BAI-Y) and the Connection to Nature Index (CNI) were administered to 60 third grade students within a large school district located in a western state during the months of February (pre-test) and May 2019 (post-test). The school had been designated as a Title I school, meaning that the school receives federal funds to assist the students because the majority of the families enrolled are financially disadvantaged. The majority of the students were Hispanic, and many speak Spanish at home. A complete demographic breakdown of the students who participated in this study is shown in Table 1. Some students identified as multiracial (one or more
races), which is why the numbers in the demographic breakdown do not necessarily add up to the total number of students in each condition.
**Table 1: Student Demographic Data**

<table>
<thead>
<tr>
<th>Demographic</th>
<th>Experimental (n=34)</th>
<th>Control (n=26)</th>
<th>Total Sample (n=60)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Race or Ethnicity</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hispanic or Latinx</td>
<td>74% n=25</td>
<td>69% n=18</td>
<td>72% n=43</td>
</tr>
<tr>
<td>White</td>
<td>21% n=7</td>
<td>27% n=7</td>
<td>23% n=14</td>
</tr>
<tr>
<td>American Indian or Alaska Native</td>
<td>9% n=3</td>
<td>4% n=1</td>
<td>7% n=4</td>
</tr>
<tr>
<td>Black or African American</td>
<td>3% n=1</td>
<td>4% n=1</td>
<td>3% n=2</td>
</tr>
<tr>
<td>Native Hawaiian or Pacific Islander</td>
<td>0% n=0</td>
<td>4% n=1</td>
<td>2% n=1</td>
</tr>
<tr>
<td>Asian</td>
<td>0% n=0</td>
<td>4% n=1</td>
<td>2% n=1</td>
</tr>
<tr>
<td><strong>Biological Sex</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>53% n=18</td>
<td>65% n=17</td>
<td>58% n=35</td>
</tr>
<tr>
<td>Female</td>
<td>47% n=16</td>
<td>35% n=9</td>
<td>42% n=25</td>
</tr>
<tr>
<td><strong>Age in Years</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eight</td>
<td>44% n=15</td>
<td>50% n=13</td>
<td>47% n=28</td>
</tr>
<tr>
<td>Nine</td>
<td>53% n=18</td>
<td>46% n=12</td>
<td>50% n=30</td>
</tr>
<tr>
<td>Ten</td>
<td>3% n=1</td>
<td>4% n=1</td>
<td>3% n=2</td>
</tr>
</tbody>
</table>

**Baseline Assessments**

Two independent t-tests were conducted to assess whether or not the groups were equivalent at baseline, or the pre-test. Levene’s test revealed homogeneity of variance for both measures, with the BAI-Y results of $F=0.061, p=.806$ and the CNI results of $F=0.267, p=.607$, indicating this assumption was not violated. There were no significant differences between groups on either measure at baseline, with the BAI-Y statistic of $t=0.886, p=.38$, and the CNI statistic of $t=1.613, p=.112$. This indicates that the groups were equivalent at the start of the study, and pre-test scores did not significantly differ between treatment groups. The results of the independent samples t-tests are outlined in Table 2.
Table 2: Independent Samples T-Tests

<table>
<thead>
<tr>
<th></th>
<th>Levene’s Test for Equality of Variance</th>
<th>Independent Samples T-Test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$F$</td>
<td>$p$</td>
</tr>
<tr>
<td>BAI-Y</td>
<td>0.061</td>
<td>.806</td>
</tr>
<tr>
<td>CNI</td>
<td>0.267</td>
<td>.607</td>
</tr>
</tbody>
</table>

Assumption Assessments

Before an ANOVA was conducted, statistical analyses were completed to ensure that the data does not violate any of the ANOVA assumptions. While Mauchly’s Test for Sphericity was conducted, sphericity can be assumed because there are only two levels of the repeated measures. Due to this, the conditions of sphericity are met. Next, normality was assessed for scores on both measures at pre and post-test. Normality was not violated for any of the measures, as assessed by the Shapiro-Wilk test, with $p = .2$ for both pre and post-test on the CNI and the pre-test on the BAI-Y and a $p = .096$ on the BAI-Y post-test, indicating a normal distribution of scores among both the experimental and control groups. A complete statistical breakdown of the normality tests can be found in Table 3. Finally, Levene’s Test of Equality of Error Variance was conducted to assess homogeneity of variance. Homogeneity of variance was not violated for any of the measures; the BAI-Y pretest $F(1,58) = 0.056$, $p = .814$, BAI-Y posttest $F(1,58) = 3.004$, $p = .088$, CNI pretest $F(1,58) = 0.305$, $p = .583$, and CNI posttest $F(1,58) = 2.405$, $p = .126$. Complete results for the tests of homogeneity can be found in Table 4. Based on these results, assumptions of the ANOVA have been met and the analysis can be conducted.
Table 3: Shapiro-Wilk Tests of Normality

<table>
<thead>
<tr>
<th></th>
<th>Control</th>
<th></th>
<th></th>
<th>Experimental</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Statistic</td>
<td>df</td>
<td>p</td>
<td>Statistic</td>
<td>df</td>
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<td>Pre BAI-Y</td>
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<td>26</td>
<td>.2</td>
<td>.088</td>
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<tr>
<td>Post BAI-Y</td>
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<td>26</td>
<td>.096</td>
<td>.097</td>
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<td>.2</td>
<td>.090</td>
<td>34</td>
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<td>.2</td>
<td>.120</td>
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Table 4: Tests of Homogeneity

Levene’s Test of Equality of Error Variances

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Analyses: Beck’s Anxiety Inventory for Youth

A two-way mixed ANOVA was conducted to assess the impact of nature-based guidance lessons on anxiety among third grade students. The descriptive statistics, detailed in Table 5 and pictured in Figure 1, show that the control group started with slightly higher levels of anxiety, and that their anxiety scores increased at the conclusion of the study, whereas the experimental group experienced a decrease in anxiety. There was no significant effect from pre-test to post-test on the BAI-Y within groups, indicating the intervention alone did not lessen anxiety; $F(1,58)=2.856$, $p=.096$, $\eta^2=.047$. However, there was a significant interaction between treatment condition and time; $F(1,58)=14.772$, $p<.001$, $\eta^2=.203$. Students in the experimental group had significantly lower scores on the post-test ($M=44.62$, $SD=7.766$) than those in the control group ($M=53.62$, $SD=11.933$). The control group actually scored at higher levels of anxiety post-test,
increasing by an average of 1.93 points. Additionally, there was a significant main effect of condition on the BAI-Y; $F(1,58)=5.788, p=.019, \eta^2_p=0.091$. This indicates that treatment condition had a significant effect on anxiety; those in the experimental group decreased on their anxiety scores at post-test by an average of 4.94 points. The complete ANOVA summary table for the BAI-Y can be found in Table 6.
**Table 5**: Descriptive Statistics for the BAI-Y

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**Table 6**: ANOVA Summary Table for the BAI-Y

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<th>F</th>
<th>p</th>
<th>η_p²</th>
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<tr>
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<td>.091</td>
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</table>

**Figure 1**: Change Over Time on the BAI-Y
Analyses: Connection to Nature Index

A two-way mixed ANOVA was conducted to assess the impact of nature-based guidance lessons on connection to nature among third grade students. The descriptive statistics, detailed in Table 7 and depicted in Figure 2, show that the experimental group started with slightly stronger connections to nature, but both groups had an increase on connection to nature at the conclusion of the study. There was a significant effect from pre-test to post-test on the CNI within groups. The intervention increased connection to nature among both groups; $F(1,58)=4.48, p=.039, \eta^2_p=.072$.

There was no significant interaction between treatment condition and time; $F(1,58)=0.052, p=.821, \eta^2_p=.001$. Students in both groups scored higher on connection to nature on the post-test, with the experimental group scoring higher ($M=4.307, SD=0.466$) than the control group ($M=4.123, SD=0.572$). However, the experimental group also had a higher score at pre-test ($M=4.164, SD=0.556$) than the control group ($M=3.945, SD=0.469$). Additionally, the change in scores from pre to post-test was similar for both groups, with the control group scoring .178 points higher and the experimental group scoring .143 points higher. There was no significant main effect of condition on the CNI; $F(1,58)=3.276, p=.075, \eta^2_p=.053$, indicating that connection to nature was similar for both groups. The complete ANOVA summary table for the CNI can be found in Table 8.
Table 7: Descriptive Statistics for the CNI

<table>
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</thead>
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<td></td>
<td>Pre-Test</td>
<td>Post-Test</td>
<td>Pre-Test</td>
<td>Post-Test</td>
</tr>
<tr>
<td><strong>M</strong></td>
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<td>4.123</td>
<td>4.164</td>
<td>4.307</td>
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<tr>
<td><strong>SD</strong></td>
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<td><strong>SE</strong></td>
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Table 8: ANOVA Summary Table for the CNI

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<th>p</th>
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<tr>
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Figure 2: Change Over Time on the CNI
CHAPTER V: DISCUSSION

Summary of the Results

This study set out to answer the research question, what are the effects of nature-based guidance lessons on elementary school students’ levels of anxiety and connection to nature, as measured by Beck’s Anxiety Inventory for Youth and the Connection to Nature Index? A single school in an urban district of a western state was chosen for this study, both out of convenience and to focus on a program that may help close the achievement gap. The entire third grade participated, with half of students receiving indoor guidance lessons and half of students receiving outdoor guidance lessons. Baseline assessments indicated that students were matched equally at the start of the study; students in each group had matched demographic information and did not score significantly different from one another on either pre-test. This indicates that differences observed are likely due to real differences, not error or an imbalanced matching of groups. To further protect the integrity of the statistical analyses, all assumptions for the Analysis of Variance (ANOVA) procedure were tested before carrying out the analyses. The results indicated that the assumptions of sphericity, normality, and homogeneity were met, indicating that the ANOVA could be run without transformed data.

A mixed ANOVA was carried out for both dependent variables, anxiety and connection to nature. The dependent variables were measured by scores on the Beck’s Anxiety Inventory for Youth (BAI-Y) and the Connection to Nature Index (CNI), respectively. Research shows that both measures are reliable and valid measures of anxiety and connection to nature among third grade aged students (Bose-Deakins & Floyd, 2004; Bragg et al., 2013; Cheng & Monroe, 2012). A multivariate assessment was
not conducted because the interest of this study lies in how a nature-based guidance program affected anxiety and connection to nature as separate, not combined, variables.

**Effects on Anxiety.** Results of the analyses conducted on the BAI-Y indicated that students in the control group started out with slightly higher, but not significantly different, levels of anxiety (M=51.69) than the experimental group (M=49.56). Although the control group started out with an average score of 2.13 points higher than the experimental group, indicating a higher level of anxiety, because this difference was not significant, the groups were evenly matched on their anxiety scores at baseline. Thus, it is likely that the differences observed at post-test are due to effects of the treatment program, rather than inherent group differences.

The descriptive statistics showed that the control group scored higher (by 1.93 points) on anxiety at post-test, which suggests that their anxiety actually increased throughout the duration of the study. While the within group variable of time was not significant, meaning that the control group’s increase in anxiety was not significantly different from baseline scores, there was a significant difference on post-test scores between groups. This means that the intervention for the control group did not impact anxiety, but the experimental group reported significantly less anxiety (reduction of 4.94 points) at the conclusion of the study. These results suggest that the intervention of nature-based guidance lessons was effective at reducing anxiety.

Although the difference in scores from pre to post-test for the control group was not significant, it is worth noting that their anxiety increased. Not only were standard, indoor guidance lessons ineffective at reducing their anxiety, they became more anxious over time, even though the curriculum for all third grade students is the same. This means
no matter which condition the students were in, they were learning the same content through guidance, classroom instruction, and took standardized tests at the same time as their peers. While the reasoning behind the increase in anxiety is unknown, there are possible explanations.

At the end of the school year the weather is warming up and student expectations increase because of standardized testing and ensuring that students have met the requirements to move onto the next grade. This researcher speculates that all students’ anxiety naturally increases towards the end of the school year, but the students in the outdoor condition were given an opportunity to reduce some of that anxiety, whereas the control group did not have an outlet. It is possible that their lack of time spent outdoors contributed to the increase in anxiety, especially for students who do not have strong coping skills. Regardless of the underlying reason for this increase, it is important to note that spending one extra class period outdoors per week significantly reduced anxiety among third graders. This is important because it provides a practical solution to an issue many students are facing. Additionally, this result may be even more powerful as anxiety is typically at its highest for both the teachers and students in late April through early May, because that is when standardized tests are conducted and all end of year goals must be met. Not only did anxiety decrease for those in the experimental group, but it decreased during one of the most stressful points in the year when a rise in anxiety would be more typical and expected.

**Effects on Connection to Nature.** The baseline assessment indicated that the experimental group started out with a higher level of connection to nature \( (M=4.164) \) than the control group \( (M=3.945) \), but this difference was not significant. These results
mean that the groups were equivalent on their scores at pre-test, so changes observed at post-test are likely due to real differences resulting from the intervention. However, the results of the analysis indicated that treatment condition did not have a significant impact on connection to nature, meaning that the experimental group did not have a significantly higher connection to nature than the control group at the conclusion of the study, despite additional exposure.

Both the experimental and control groups showed a similar increase in connection to nature at the conclusion of the study, which is visually depicted in Figure 2. While there was no significant interaction between treatment condition and time, there was a significant main effect of time. Both groups scored higher on the CNI, indicating a stronger connection to nature, at the conclusion of the study, with the experimental group showing a mean increase of .143 points and the control group of .178 points. Interestingly, the students receiving indoor guidance lessons also reported a stronger connection to nature at the conclusion of the study, even though they were not exposed to nature more than is typical.

As mentioned, the weather starts getting warmer towards the end of the school year, so it is possible that students in both groups experienced an increase in connection to nature because they were likely spending more time outdoors as the study progressed. The study began in February, in a city where the temperature averages 52 degrees, and ended in May, where the temperature average increases to about 74 degrees. Furthermore, spring sports such as soccer begin in April, so students who participate in those sports would have been spending more time outdoors regardless of participation in this study. These results indicate that even without the introduction of an intentional plan
to expose students to nature more frequently, many students can still experience an increase in connection to nature through other means.

**Conclusion**

This study addressed the issue of the lack of quantitatively driven research in the area of ecotherapy, as noted by Burls and Caan (2005). Furthermore, there are no studies at this time investigating the role of school counselors in implementing ecotherapy techniques and practices. Ecotherapy studies conducted in elementary school settings are largely focused on science-based curriculum, and there is a lack of research integrating ecotherapy into the schools outside of STEM subjects (Camasso & Jagannathan, 2018). Despite the need for more empirical support for ecotherapy practices in all areas of counseling, many counselors are beginning incorporate ecotherapy into their practice, highlighting the need for evidenced based research to support and guide these clinicians (Jordan, 2014; Wolsko & Hoyt, 2012).

The results of this study indicate that a nature-based (outdoor) guidance program was effective at reducing anxiety among third grade students. Not only does this study contribute to the growing field of ecotherapy, but also makes the case for a cost-effective solution to address students’ lack of opportunities to engage with the natural world, especially with underserved student populations. Students have the most opportunities to spend time in nature at school, where they spend most of their day and are safely supervised while outdoors (Barton et al., 2015). It logically follows that schools would provide such opportunities, given the importance of spending time in nature on healthy development across emotional, social, and physical domains (Carter, 2016; Greenleaf et al., 2014; Louv, 2005). However, while the majority of school principals reported belief
in the importance of spending time outdoors, elimination of recess remains the most common punishment for elementary school aged students (RWJF, 2010). The introduction of a nature-based guidance program would not interfere with such punishments and could help ensure that students still have an opportunity to go outside, even if their recess or physical education has been eliminated.

Children today have fewer opportunities to go outside than any previous generation, largely in part due to parental fears and having too many other scheduled activities to attend to (Flom et al., 2011; Greenleaf et al., 2014; Louv, 2005; Sackett, 2010). Furthermore, children are facing significantly higher rates of stress related disorders, with anxiety among the most commonly diagnosed childhood disorders (Brown, 2013; Swank et al., 2017). It can be speculated that the lack of time spent outdoors contributes to the rise of disorders such as anxiety, because of the well documented negative effects from not spending time in nature (Louv, 2005). Children diagnosed with stress related disorders are more likely to experience negative long-term outcomes such as poor academic achievement, school suspensions, delinquency, substance abuse, poor interpersonal relationships, and an increased risk of being diagnosed with a mental disorder as an adult (Grills-Taquechel et al., 2013; Kösters et al., 2017; Sanchez et al., 2018; Swank et al., 2017). Furthermore, stress related disorders diagnosed in childhood typically persist throughout the person’s lifetime (Sanchez et al., 2018).

The results of this study indicate that spending more time outdoors significantly reduced anxiety for elementary school students. The importance of this cannot be understated, as anxiety specifically has incredibly detrimental effects on children’s
developing bodies and brains, including weakened immune system and bones, increased risk of cancer, poor academic outcomes, and increased risk of substance abuse later in life (Kang, 2017). Programs targeting prevention and symptom reduction are vital to the healthy development of children, who are our future. While other school counseling programs address the issue of anxiety, moving outside has the distinct advantage of reducing children’s risk of developing stress related disorders, which includes anxiety (Bird, 2007). Furthermore, frequent contact with nature is a protective factor against stress and negative states, and effectively moderates life stress in elementary school aged children (Mayer et al., 2009; Wells & Evans, 2003).

This researcher postulates that the theoretical underpinning of these findings can be linked back to Kaplan and Kaplan’s (1989) Attention Restoration Theory. Students are required to use large amounts of direct attention throughout the school day, often times demanding more direct attention than is developmentally appropriate. Because this study was done in a Title I school, there is an even larger focus on testing and assessments, which are needed for continued funding and are used as the primary tools to show student progress. This means that students at the school chosen for this study do not get much time, if any, to use indirect attention during the school day, with the exceptions of recess and lunch. While students did need to use direct attention during the guidance lesson, it was not to the same extent typically required during academic lessons, and they were given the opportunity to engage in fascination on our ways to and from the lesson. Going outside also gave students an opportunity to get away from daily routine and provided a rich environment with green views all around. The outdoor area chosen was also compatible with, and appropriate for, the goals of the guidance lessons. By providing
students with all of the necessary components of ART, students were able to relax and their attention was restored, as evidenced by the experimental group’s significant reduction in anxiety. To investigate this further, future researchers should consider giving an anxiety measure immediately before and after each lesson to get a more accurate and immediate picture of the effect.

Researchers have also found that students from low socio-economic backgrounds are at a higher risk for developing stress related disorders and have significantly fewer protective factors (Hawkes & Furst, 1971; Kim et al., 2015). This particular study was conducted in a Title I school, where the large majority of students come from low SES and disadvantaged backgrounds. Since these students are at a particularly high risk for the development of mental disorders, counselors have an ethical responsibility to provide preventative, secondary, and tertiary services to these students aimed at reducing symptoms and developing coping skills. The implementation of a nature-based guidance program is one way counselors can address this need and work to close the achievement gap.

Strengthening students’ connection to nature is not only a vital component of their health, development, sense of self, and social skills, but also affects the future of our planet. Fostering children’s connection to nature improves their lives and healthy development, and one will one day in the future be a critical factor affecting legislation, conservation of natural resources, and the state of the earth as a whole. As Nature Deficit Disorder remains on the rise, it is often counselors who are called upon to address the symptoms of this disorder, including impaired cognitive and emotional functioning and well-being (Louv, 2005).
Implications for School Counselors

It is imperative that counselors understand the role nature plays in these issues, otherwise they will end up treating a surface level symptom set without ever getting to the root of the issue. More specifically, elementary school counselors need to be made aware of the role of connection to nature across academic, social, and emotional domains because they are in frequent contact with students facing these issues. This study provides a valuable model for school counselors that can be implemented in schools throughout the nation. Counselors proficient in ecotherapy could also provide a needed service by training other counselors in ecotherapy interventions and techniques, such as the one utilized in this study.

At the elementary level, school counselors also have the opportunity to focus on prevention, by proactively engaging students with the natural environment, before they begin to experience the negative effects from lack of time spent outside. While the results of this study showed that connection to nature improved among both groups of students, only the experimental group also experienced a decrease in anxiety. It is possible that while students have a strong connection to nature, their anxiety was not reduced because they are unable to spend as much time in nature as they would like. A strong connection to nature alone is not enough to reduce anxiety or mediate stress; it needs to be accompanied with frequent contact with nature.

Future Research

While this research study makes a valuable contribution to the field of ecotherapy, there are several recommendations for future research to build and expand on this study. First, while a reduction in anxiety was observed in the experimental group, more research
is needed to better understand how well these reductions are maintained. The use of an A-B-A-B research design can help researchers better understand the effects of a nature-based intervention program, and whether or not the gains are maintained. This specific design involves assessing the students at baseline, providing an intervention, removal of the intervention, and the re-introduction of the intervention. A design such as this can illuminate whether or not students who experience a decrease in anxiety as a result of the intervention are able to keep a lower level of anxiety after it has ended, and how well the intervention works at two points in time. In this way, the selected population serves as their own control and experimental group. Furthermore, it would also be valuable to see the difference in response to intervention during different seasons, and whether or not temperature or weather has an effect on the results. It is possible that seasonal changes have an effect on anxiety, so a design that spans over multiple seasons is necessary.

A study that takes place for the duration of the entire school year is also recommended, with an experimental and control group, such as those in this study. By conducting the study over the course of the year, the entire guidance curriculum can be implemented, and again the effect of different seasons can be accounted for better. Assessing the students at the end of each school quarter (once every 10 weeks), will provide insight on how different times of the year effect the study. Additional variables should be accounted for, such as high-stakes testing periods, seasonal changes, and whether or not the students are currently participating in an outdoor sport. Furthermore, using a multiple baseline design may give deeper insight to the effect of seasonal changes.
Research investigating the effects of ecotherapy on those who live in rural communities would also provide valuable insights to the healing power of being outdoors. Many people who live in rural areas spend the majority of their days outdoors, primarily to work (on farms, fields, and so forth), yet experience high levels of anxiety. However, adolescents in rural communities were both the least likely to seek help and had the highest suicide rates, according to the results of one study (Thompson, Sugg & Runkle, 2018). This data illuminates a discrepancy; people in rural communities are not showing signs of improved mental health compared to other geographic populations, despite spending significantly more time outdoors. This speaks to the quality of time spent outdoors, it is clear that being outside alone is not enough to access the healing potential of the natural environment in a meaningful way.

Finally, a qualitative driven study investigating why students in the control group who experienced an increase in connection to nature did not experience a decrease in anxiety. Because the interaction between time and treatment condition was not significant for the CNI, yet students in both conditions had a significantly stronger connection to nature at the end of the study, more information is needed to understand the how and why. A phenomenological study, or phenomenological component of a mixed methods study, would have brought more insight to this finding. Not only was there no decrease in anxiety among the control group, it had actually increased at the conclusion of the study. Without qualitative data, it cannot be known if the students had an adverse reaction to the intervention, if they were just having a bad day, or any other possible reason for their increase in anxiety. Although there is a significant need for more quantitative research,
employing a mixed methods design or supplemental qualitative data is crucial to understanding the underlying reasoning for the results.
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doi:10.1080/00958964.1987.10801955


doi:10.1080/13642537.2010.530105


APPENDICES
Appendix A

PATHS® Curriculum Correlations to ASCA National Standards for Students

Grade 3 Curriculum, Unit 3: Feelings are Important

Lesson 10: Introduction to Feelings

A:A1.3 Take pride in work and achievement.
A:A1.5 Identify attitudes and behaviors that lead to successful learning.
A:A3.2 Demonstrate the ability to work independently, as well as the ability to work cooperatively with other students.

PS:A1.1 Develop positive attitudes toward self as a unique and worthy person.
PS:A1.5 Identify and express feelings.
PS:A1.9 Demonstrate cooperative behavior in groups.
PS:A1.10 Identify personal strengths and assets.
PS:A2.3 Recognize, accept, respect and appreciate individual differences.
PS:A2.6 Use effective communications skills.
PS:A2.7 Know that communication involves speaking, listening and nonverbal behavior.
PS:B1.7 Demonstrate a respect and appreciation for individual and cultural differences.

Lesson 11: Recognizing and Controlling Anger

A:A1.3 Take pride in work and achievement.
A:A1.5 Identify attitudes and behaviors that lead to successful learning.
A:A3.2 Demonstrate the ability to work independently, as well as the ability to work cooperatively with other students.

A:B1.2 Learn and apply critical-thinking skills.

PS:A1.1 Develop positive attitudes toward self as a unique and worthy person.

PS:A1.5 Identify and express feelings.

PS:A1.9 Demonstrate cooperative behavior in groups.

PS:A1.10 Identify personal strengths and assets.

PS:A2.3 Recognize, accept, respect and appreciate individual differences.

PS:A2.6 Use effective communications skills.

PS:A2.7 Know that communication involves speaking, listening and nonverbal behavior.

PS:B1.7 Demonstrate a respect and appreciation for individual and cultural differences.

Lesson 12: Calm or Relaxed, Tense

A:A1.3 Take pride in work and achievement.

A:A1.5 Identify attitudes and behaviors that lead to successful learning.

PS:A1.1 Develop positive attitudes toward self as a unique and worthy person.

PS:A1.5 Identify and express feelings.

PS:A1.8 Understand the need for self-control and how to practice it.

PS:A1.10 Identify personal strengths and assets.
PS:A2.3 Recognize, accept, respect and appreciate individual differences.

PS:A2.6 Use effective communications skills.

PS:A2.7 Know that communication involves speaking, listening and nonverbal behavior.

PS:B1.4 Develop effective coping skills for dealing with problems.

PS:B1.7 Demonstrate a respect and appreciation for individual and cultural differences.

PS:C1.10 Learn techniques for managing stress and conflict.

PS:C1.11 Learn coping skills for managing life events.

Lesson 13: Guilty

A:A1.3 Take pride in work and achievement.

A:A1.5 Identify attitudes and behaviors that lead to successful learning.

A:A3.1 Take responsibility for their actions.

A:A3.2 Demonstrate the ability to work independently, as well as the ability to work cooperatively with other students.

A:B1.2 Learn and apply critical-thinking skills.

PS:A1.1 Develop positive attitudes toward self as a unique and worthy person.

PS:A1.5 Identify and express feelings.

PS:A1.6 Distinguish between appropriate and inappropriate behavior.

PS:A1.8 Understand the need for self-control and how to practice it.
PS:A1.9 Demonstrate cooperative behavior in groups.

PS:A1.10 Identify personal strengths and assets.

PS:A2.1 Recognize that everyone has rights and responsibilities.

PS:A2.2 Respect alternative points of view.

PS:A2.3 Recognize, accept, respect and appreciate individual differences.

PS:A2.6 Use effective communications skills.

PS:A2.7 Know that communication involves speaking, listening and nonverbal behavior.

PS:B1.7 Demonstrate a respect and appreciation for individual and cultural differences.

PS:C1.10 Learn techniques for managing stress and conflict.

PS:C1.11 Learn coping skills for managing life events.

Lesson 14: Jealous

A:A1.3 Take pride in work and achievement.

A:A1.5 Identify attitudes and behaviors that lead to successful learning.

A:A3.1 Take responsibility for their actions.

A:A3.2 Demonstrate the ability to work independently, as well as the ability to work cooperatively with other students.

A:B1.2 Learn and apply critical-thinking skills.

PS:A1.1 Develop positive attitudes toward self as a unique and worthy person.
PS:A1.5 Identify and express feelings.

PS:A1.6 Distinguish between appropriate and inappropriate behavior.

PS:A1.8 Understand the need for self-control and how to practice it.

PS:A1.9 Demonstrate cooperative behavior in groups.

PS:A1.10 Identify personal strengths and assets.

PS:A2.1 Recognize that everyone has rights and responsibilities.

PS:A2.2 Respect alternative points of view.

PS:A2.3 Recognize, accept, respect and appreciate individual differences.

PS:A2.6 Use effective communications skills.

PS:A2.7 Know that communication involves speaking, listening and nonverbal behavior.

PS:B1.7 Demonstrate a respect and appreciation for individual and cultural differences.

PS:C1.10 Learn techniques for managing stress and conflict.

PS:C1.11 Learn coping skills for managing life events.

**Lesson 15: Feelings Dictionary**

A:A1.3 Take pride in work and achievement.

PS:A1.1 Develop positive attitudes toward self as a unique and worthy person.

PS:A1.5 Identify and express feelings.

PS:A1.10 Identify personal strengths and assets.
PS:A2.3 Recognize, accept, respect and appreciate individual differences.

PS:A2.6 Use effective communications skills.

PS:B1.7 Demonstrate a respect and appreciation for individual and cultural differences.
Appendix B

ASCA National Standards for Students

Academic Development

ASCA National Standards for academic development guide school counseling programs to implement strategies and activities to support and maximize each student’s ability to learn.

Standard A: Students will acquire the attitudes, knowledge and skills that contribute to effective learning in school and across the life span.

A:A1 Improve Academic Self-concept

A:A1.1 Articulate feelings of competence and confidence as learners
A:A1.2 Display a positive interest in learning
A:A1.3 Take pride in work and achievement
A:A1.4 Accept mistakes as essential to the learning process
A:A1.5 Identify attitudes and behaviors that lead to successful learning

A:A2 Acquire Skills for Improving Learning

A:A2.1 Apply time-management and task-management skills
A:A2.2 Demonstrate how effort and persistence positively affect learning
A:A2.3 Use communications skills to know when and how to ask for help when needed
A:A2.4 Apply knowledge and learning styles to positively influence school performance

A:A3 Achieve School Success

A:A3.1 Take responsibility for their actions

A:A3.2 Demonstrate the ability to work independently, as well as the ability to work cooperatively with other students

A:A3.3 Develop a broad range of interests and abilities

A:A3.4 Demonstrate dependability, productivity and initiative

A:A3.5 Share knowledge

Standard B: Students will complete school with the academic preparation essential to choose from a wide range of substantial post-secondary options, including college.

A:B1 Improve Learning

A:B1.1 Demonstrate the motivation to achieve individual potential

A:B1.2 Learn and apply critical-thinking skills

A:B1.3 Apply the study skills necessary for academic success at each level

A:B1.4 Seek information and support from faculty, staff, family and peers

A:B1.5 Organize and apply academic information from a variety of sources

A:B1.6 Use knowledge of learning styles to positively influence school performance

A:B1.7 Become a self-directed and independent learner
**A:B2 Plan to Achieve Goals**

**A:B2.1** Establish challenging academic goals in elementary, middle/jr. high and high school

**A:B2.2** Use assessment results in educational planning

**A:B2.3** Develop and implement annual plan of study to maximize academic ability and achievement

**A:B2.4** Apply knowledge of aptitudes and interests to goal setting

**A:B2.5** Use problem-solving and decision-making skills to assess progress toward educational goals

**A:B2.6** Understand the relationship between classroom performance and success in school

**A:B2.7** Identify post-secondary options consistent with interests, achievement, aptitude and abilities

**Standard C:** Students will understand the relationship of academics to the world of work and to life at home and in the community.

**A:C1 Relate School to Life Experiences**

**A:C1.1** Demonstrate the ability to balance school, studies, extracurricular activities, leisure time and family life

**A:C1.2** Seek co-curricular and community experiences to enhance the school experience
A:C1.3 Understand the relationship between learning and work

A:C1.4 Demonstrate an understanding of the value of lifelong learning as essential to seeking, obtaining and maintaining life goals

A:C1.5 Understand that school success is the preparation to make the transition from student to community member

A:C1.6 Understand how school success and academic achievement enhance future career and vocational opportunities

Careers Development

ASCA National Standards for career development guide school counseling programs to provide the foundation for the acquisition of skills, attitudes and knowledge that enable students to make a successful transition from school to the world of work, and from job to job across the life span.

Standard A: Students will acquire the skills to investigate the world of work in relation to knowledge of self and to make informed career decisions.

C:A1 Develop Career Awareness

C:A1.1 Develop skills to locate, evaluate and interpret career information

C:A1.2 Learn about the variety of traditional and nontraditional occupations

C:A1.3 Develop an awareness of personal abilities, skills, interests and motivations

C:A1.4 Learn how to interact and work cooperatively in teams

C:A1.5 Learn to make decisions
C:A1.6 Learn how to set goals
C:A1.7 Understand the importance of planning
C:A1.8 Pursue and develop competency in areas of interest
C:A1.9 Develop hobbies and vocational interests
C:A1.10 Balance between work and leisure time

C:A2 Develop Employment Readiness
C:A2.1 Acquire employability skills such as working on a team, problem-solving and organizational skills
C:A2.2 Apply job readiness skills to seek employment opportunities
C:A2.3 Demonstrate knowledge about the changing workplace
C:A2.4 Learn about the rights and responsibilities of employers and employees
C:A2.5 Learn to respect individual uniqueness in the workplace
C:A2.6 Learn how to write a résumé
C:A2.7 Develop a positive attitude toward work and learning
C:A2.8 Understand the importance of responsibility, dependability, punctuality, integrity and effort in the workplace
C:A2.9 Utilize time- and task-management skills

Standard B: Students will employ strategies to achieve future career goals with success and satisfaction.

C:B1 Acquire Career Information
C:B1.1 Apply decision-making skills to career planning, course selection and career transition

C:B1.2 Identify personal skills, interests and abilities and relate them to current career choice

C:B1.3 Demonstrate knowledge of the career-planning process

C:B1.4 Know the various ways in which occupations can be classified

C:B1.5 Use research and information resources to obtain career information

C:B1.6 Learn to use the Internet to access career-planning information

C:B1.7 Describe traditional and nontraditional career choices and how they relate to career choice

C:B1.8 Understand how changing economic and societal needs influence employment trends and future training

C:B2 Identify Career Goals

C:B2.1 Demonstrate awareness of the education and training needed to achieve career goals

C:B2.2 Assess and modify their educational plan to support career

C:B2.3 Use employability and job readiness skills in internship, mentoring, shadowing and/or other work experience

C:B2.4 Select course work that is related to career interests

C:B2.5 Maintain a career-planning portfolio
Standard C: Students will understand the relationship between personal qualities, education, training and the world of work.

C:C1 Acquire Knowledge to Achieve Career Goals

C:C1.1 Understand the relationship between educational achievement and career success
C:C1.2 Explain how work can help to achieve personal success and satisfaction
C:C1.3 Identify personal preferences and interests influencing career choice and success
C:C1.4 Understand that the changing workplace requires lifelong learning and acquiring new skills
C:C1.5 Describe the effect of work on lifestyle
C:C1.6 Understand the importance of equity and access in career choice
C:C1.7 Understand that work is an important and satisfying means of personal expression

C:C2 Apply Skills to Achieve Career Goals

C:C2.1 Demonstrate how interests, abilities and achievement relate to achieving personal, social, educational and career goals
C:C2.2 Learn how to use conflict management skills with peers and adults
C:C2.3 Learn to work cooperatively with others as a team member
C:C2.4 Apply academic and employment readiness skills in workbased learning situations such as internships, shadowing and/or mentoring experiences
Personal/Social Development

ASCA National Standards for personal/social development guide school counseling programs to provide the foundation for personal and social growth as students progress through school and into adulthood.

Standard A: Students will acquire the knowledge, attitudes and interpersonal skills to help them understand and respect self and others.

PS:A1 Acquire Self-knowledge

PS:A1.1 Develop positive attitudes toward self as a unique and worthy person

PS:A1.2 Identify values, attitudes and beliefs

PS:A1.3 Learn the goal-setting process

PS:A1.4 Understand change is a part of growth

PS:A1.5 Identify and express feelings

PS:A1.6 Distinguish between appropriate and inappropriate behavior

PS:A1.7 Recognize personal boundaries, rights and privacy needs

PS:A1.8 Understand the need for self-control and how to practice it PS:A1.9 Demonstrate cooperative behavior in groups

PS:A1.10 Identify personal strengths and assets

PS:A1.11 Identify and discuss changing personal and social roles

PS:A1.12 Identify and recognize changing family roles
PS:A2 Acquire Interpersonal Skills

- PS:A2.1 Recognize that everyone has rights and responsibilities
- PS:A2.2 Respect alternative points of view
- PS:A2.3 Recognize, accept, respect and appreciate individual differences
- PS:A2.4 Recognize, accept and appreciate ethnic and cultural diversity
- PS:A2.5 Recognize and respect differences in various family configurations
- PS:A2.6 Use effective communications skills
- PS:A2.7 Know that communication involves speaking, listening and nonverbal behavior
- PS:A2.8 Learn how to make and keep friends

**Standard B:** Students will make decisions, set goals and take necessary action to achieve goals.

PS:B1 Self-knowledge Application

- PS:B1.1 Use a decision-making and problem-solving model
- PS:B1.2 Understand consequences of decisions and choices
- PS:B1.3 Identify alternative solutions to a problem
- PS:B1.4 Develop effective coping skills for dealing with problems
- PS:B1.5 Demonstrate when, where and how to seek help for solving problems and making decisions
- PS:B1.6 Know how to apply conflict resolution skills
PS:B1.7 Demonstrate a respect and appreciation for individual and cultural differences

PS:B1.8 Know when peer pressure is influencing a decision

PS:B1.9 Identify long- and short-term goals

PS:B1.10 Identify alternative ways of achieving goals

PS:B1.11 Use persistence and perseverance in acquiring knowledge and skills

PS:B1.12 Develop an action plan to set and achieve realistic goals

**Standard C:** Students will understand safety and survival skills.

**PS:C1 Acquire Personal Safety Skills**

PS:C1.1 Demonstrate knowledge of personal information (i.e., telephone number, home address, emergency contact)

PS:C1.2 Learn about the relationship between rules, laws, safety and the protection of rights of the individual

PS:C1.3 Learn about the differences between appropriate and inappropriate physical contact

PS:C1.4 Demonstrate the ability to set boundaries, rights and personal privacy

PS:C1.5 Differentiate between situations requiring peer support and situations requiring adult professional help

PS:C1.6 Identify resource people in the school and community, and know how to seek their help
**PS:C1.7** Apply effective problem-solving and decision-making skills to make safe and healthy choices

**PS:C1.8** Learn about the emotional and physical dangers of substance use and abuse

**PS:C1.9** Learn how to cope with peer pressure

**PS:C1.10** Learn techniques for managing stress and conflict

**PS:C1.11** Learn coping skills for managing life events
Appendix C

IRB Approval

DATE: September 20, 2018
TO: Ken Coll, PhD
FROM: University of Nevada, Reno Institutional Review Board (IRB)
PROJECT TITLE: [1293607-2] The Impact of Nature Based Guidance Lessons on Elementary Students’ Anxiety and Connection to Nature
REFERENCE #: Social Behavioral
SUBMISSION TYPE: Revision
ACTION: APPROVED
APPROVAL DATE: September 20, 2018
EXPIRATION DATE: September 20, 2019
REVIEW TYPE: Expedited Review
REVIEW CATEGORY: Expedited review # 7
ANNUAL UPDATE TYPE: Continuing review

The UNR IRB has reviewed and approved in the above-referenced protocol in accordance with the requirements of the Code of Federal Regulations on the Protection of Human Subjects (45 CFR 46 and 21 CFR 50 and 56). This approval is based on assessment that the research met all applicable regulatory criteria. The research must be conducted in accordance with this approved submission. This submission has received Expedited Review based on applicable federal regulations.

Please prepare a Continuing Review / Progress Report Request at least 4 weeks prior to the approval expiration date using IRBNet https://www.irbnet.org. IRBNet will send you a courtesy reminder to that effect. Unless updated, the IRB is only authorized to approve a study activity for 12 months or less. There is no grace period. The study will be closed on the above stated expiration date unless the IRB receives and approves your annual update.

Instructions for preparing a modification, continuing review, or status report are located at http://www.unr.edu/research-integrity/human-research/irbnet. Call our office if you have any questions or problems with use of IRBNet software.

Approved Documents

- Application Form - Part II Application with IRB edits.docx (UPDATED: 09/17/2018)
- Application Form - FERPA form.docx (UPDATED: 09/17/2018)
- Application Form - Child Population Form.docx (UPDATED: 09/17/2018)
- Parental Permission Form - Parent Permission with IRB edits.doc (UPDATED: 09/17/2018)
- Questionnaire/Survey - Beck Anxiety Inventory copy.pdf (UPDATED: 09/17/2018)
- Questionnaire/Survey - Connection to Nature Index.pdf (UPDATED: 09/17/2018)
Appendix D

Connection to Nature Index

Children’s connection to Nature
Please spare a few minutes to answer our questionnaire!

We need your help - We would like you to complete this short questionnaire containing 3 different sets of questions about how you feel about nature.

Anything you tell us will be in private and we will not show your answers to anyone else. You do not have to answer the questions if you do not want to. If you can’t answer a question just leave it, or ask an adult for help. Then go onto the next question. When you have completed the questionnaire please hand it back to the person who gave it to you.

Thank you!

Please tell us whether you are a Boy or a Girl

Please tell us how old you are....

Now in sections A, B and C we will be asking you about nature

Section A

For each of the following, please tell us how much you agree with each statement, using the scale as shown below. Please respond as you really feel, rather than how you think “most people” feel.

<table>
<thead>
<tr>
<th>Statements:</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neither agree or disagree</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>My favourite places are outside, in nature</td>
<td>😊😊</td>
<td>😊😊</td>
<td>😠😠</td>
<td>😠😠</td>
<td>😠😠</td>
</tr>
<tr>
<td>I think about how what I do affects the earth</td>
<td>😊😊</td>
<td>😊😊</td>
<td>😠😠</td>
<td>😠😠</td>
<td>😠😠</td>
</tr>
<tr>
<td>My feelings about nature and the earth are a part of my soul</td>
<td>😊😊</td>
<td>😊😊</td>
<td>😠😠</td>
<td>😠😠</td>
<td>😠😠</td>
</tr>
<tr>
<td>I take notice of wildlife wherever I am.</td>
<td>😊😊</td>
<td>😊😊</td>
<td>😠😠</td>
<td>😠😠</td>
<td>😠😠</td>
</tr>
<tr>
<td>My relationship to nature is an important part of who I am.</td>
<td>😊😊</td>
<td>😊😊</td>
<td>😠😠</td>
<td>😠😠</td>
<td>😠😠</td>
</tr>
<tr>
<td>I feel very connected to all living things and the earth</td>
<td>😊😊</td>
<td>😊😊</td>
<td>😠😠</td>
<td>😠😠</td>
<td>😠😠</td>
</tr>
</tbody>
</table>

Adapted from Nisbet 2009
Section B

Please tell us how much you agree or disagree with each of the following statements, by putting a tick in the relevant box.

<table>
<thead>
<tr>
<th>Statements:</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neither agree or disagree</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>I like to hear different sounds in nature</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I like to see wild flowers in nature</td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>When I feel sad, I like to go outside and enjoy nature</td>
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<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Being in the natural environment makes me feel peaceful</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I like to garden</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Collecting rocks and shells is fun</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I feel sad when wild animals are hurt</td>
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<tr>
<td>I like to see wild animals living in a clean environment</td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>I enjoy touching animals and plants</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Taking care of animals is important to me</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Humans are part of the natural world</td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>People cannot live without plants and animals</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Being outdoors makes me happy</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>My actions will make the natural world different</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Picking up trash on the ground can help the environment</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>People do not have the right to change the natural environment</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Was there anything about this section that you did not understand? Yes [ ] No [ ]
As before, if there was something in this section that you did not understand, please tell us by putting a circle around it

Section C

How interconnected are you with nature? Please circle the picture below which best describes your relationship with the natural environment.

[Diagram of Venn diagrams showing varying levels of interaction between 'Me' and 'Nature']

Was there anything about this section that you did not understand?  
Yes [ ]  No [ ]

If there was something in this section that you did not understand, please tell us by putting a cross by it.

Please tell us which section that you liked best, or which you found the easiest to understand.  
Section A, B or C [ ]

If there is anything else you would like to tell us about our questionnaire then please write it in the box below..........

That's all!

Thank you very much for sparing the time to fill out this questionnaire

Please hand the questionnaire back to the person that gave it to you
Appendix E

Demographic Questionnaire

Please fill out the information below as accurately as possible.

First Name: ________________ Last Name: __________________

Age: □ 7       □ 8       □ 9       □ 10
Please check your current age.

Sex: □ Male       □ Female
Please check your biological sex.

Race/Ethnicity:

□ American Indian/Alaska Native      □ Asian
□ Black or African American         □ Hispanic or Latino
□ Native Hawaiian/Pacific Islander  □ White
Please check all that apply.

Do you participate in outdoor activities?

□ Baseball       □ Basketball       □ Biking       □ Fishing
□ Football       □ Gardening        □ Golf         □ Hiking
□ Hockey         □ Running          □ Ski/Snowboard □ Soccer
□ Tennis         □ Volleyball

□ Other: _____________________________________________

Please check all that apply.
Only check off activities that you do outside.
Appendix F

Principal Agreement

Echo Loder Elementary School

600 Apple Street
Reno, Nevada 89502
Phone (775) 689-2540
Fax (775) 689-2542

August 22, 2018

Dear Bethany Sheridan,

Re: The Impact of Nature Based Guidance Lessons on Elementary Students’ Anxiety and Connection to Nature

This letter confirms (1) I acknowledge the research to be conducted as nature based guidance lessons with elementary students, with half of the students receiving indoor lessons and half receiving outdoor lessons over an 8-week period. Additionally, pre and post tests measuring anxiety and connection to nature will be conducted by licensed school psychologist, Jill Packman, with your assistance. Permission slips will be sent home to each child’s parents/guardians, in addition to their assent to participation; and (2) I grant permission for you to involve our school counselor, students, and teachers in the proposed research at Echo Loder Elementary School.

I confirm that I am authorized to provide permission to allow this study to take place at our site.

Dina Caramella
Principal
Echo Loder Elementary School
DCiaramella@washoeschools.net
Appendix G

Permission Slip

University of Nevada, Reno

Parent Permission Form

**Title of Study:** The Effects of Nature-Based Guidance Lessons on Third Grade Students’ Anxiety and Connection to Nature

**Principal Investigator:** Ken Coll, PhD

**Co-Principal Investigator:** Bethany Sheridan

**Study Contact:** bethany@nevada.unr.edu

**Study ID Number:**

**SUMMARY OF KEY ELEMENTS**

This is a consent to participate in a school counseling research study. Your child’s participation is completely voluntary and it is your choice whether or not to give consent.

This research study will investigate the effects of nature-based guidance lessons on anxiety and connection to nature. Half of the classrooms involved will receive guidance lessons outdoors on the soccer field, and the other half will receive guidance as usual in their classroom. Students will be given a pre and post test, one for anxiety and one for connection to nature. The tests will be administered to the entire class at one time, and should take about 15 minutes to complete. You have a right to review the instruments and materials before the study if you choose. There are no known risks to the students receiving indoor guidance, and the risks to students receiving outdoor guidance include allergic reactions to the environment, possibility of falling and getting hurt while walking...
out to the field, and being stung or bitten by insects. The benefits your child may receive are reduced anxiety, higher connection to nature, and improved classroom behaviors, mood, self-esteem, and academic achievement. The alternative to being a participant in this study is to either stay with the primary classroom teacher during guidance lessons, or to join another class of the same grade for the 30 minute period that guidance lessons will be conducted.

**Introduction**

Your child is being invited to participate in a research study. Before you agree to your child’s participation in the study, read this form carefully. It explains why we are doing the study; and the procedures, risks, discomforts, benefits and precautions involved.

At any time, you or your child may ask one of the researchers to explain anything about the study that you or your child do not understand.

Your child does not have to be in this study. Her/his participation is voluntary. If you do not agree for your child to participate, your child will receive the care/education she/he would have received if the study was not taking place.

Take as much time as you need for you and your child to decide. If you agree now but change your mind, you may withdraw your child from the study at any time. Just let one of the researchers know you do not want your child to continue.

**Why are we doing this study?**

We are doing this study to find out what effects nature-based guidance lessons will have on anxiety and connection to nature in elementary students.
Benefits of research cannot be guaranteed; however, we hope to learn more about the positive effects of spending more time in nature, including reduced levels of stress and anxiety, and improved connection to nature.

**Why are we asking your child to be in this study?**

We are asking you to allow your child to participate because she/he is a 3rd grade student at Echo Loder Elementary School.

**How many people will be in this study?**

We expect to enroll 100 participants at Echo Loder Elementary School.

**What will your child be asked to do if you agree to allow your child to be in the study?**

If you give permission for your child to be in this research study, she/he will be asked to either go outside for a 30 minute guidance lesson, or stay in their classroom for a guidance lesson. The guidance lessons will be developed with the primary school counselor, Manuel Magana, and will not deviate from what would have been delivered as part of the guidance curriculum.

**How long will your child be in the study?**

The study will take about 30 minutes of your child’s time; she/he will participate for about 10 weeks. Guidance will be conducted every week during the study, but children
already receive bi-weekly guidance for 30 minutes. Therefore, your child will be asked to receive 4 extra guidance lessons, and to take a 15 minute pre and post test.

**What are your choices if your child does not volunteer to be in this research study?**

If your and/or your child decide not to be in the study, your other choices may include:

- Getting no treatment.
- Getting standard guidance lessons without being in a study.

**What if you agree to have your child be in the study now, but change your mind later?**

Your child does not have to stay in the study. You may withdraw your child or your child may withdraw from the study at any time by contacting myself, Bethany Sheridan, or the school counselor, Manuel Magana. Please call the Echo Loder main office at 775-689-2540, or email me at bethany@nevada.unr.edu, if you wish to withdraw.

**What if the study changes while your child is in it?**

If anything about the study changes or if we want to use your child’s information in a different way, we will tell you and your child, and ask if your child will remain in the study. We will also tell you about any important new information that may affect your willingness allow your child to stay in the study.

**Is there any way being in this study could be bad for your child?**
If your child participates in this study she/he may be exposed to the natural environment, which includes potential allergens and insects.

**What happens if your child becomes injured because of her/his participation in the study?**

In the event that this research activity results in an injury, treatment will be available. This includes first aid, emergency treatment, and follow-up care as needed. Care for such injuries will be provided by the school nurse and parents will be contacted immediately.

**Will being in this study help your child in any way?**

We cannot promise your child will benefit from being in this study but she/he may experience a reduction in anxiety, improve their connection with nature, and may experience additional known benefits from contact with nature such as improved academic performance, on-task behaviors, self-esteem, and mood.

**Who will pay for the costs of your child’s participation in this research study?**

No costs are associated with participation in this study.

**Will you (or your child) be paid for your child’s participation in this study?**

Neither you nor your child will receive any payment for being this study.

**Who will know that your child is in this study and who will have access to the information we collect about your child?**
The researchers, University of Nevada, Reno Institutional Review Board, US Department of Health and Human Services (DHHS), and Ken Coll, PhD will have access to your child’s study records. Your child will not be identified in the research in any way. Additionally, the school principal, school counselor, and your child’s classroom teacher will know that your child is in this study. All WCSD employees, including the researcher, classroom teacher, and school staff, are mandatory reporters. This means that if anyone at the school and/or involved in this study believes a child has been abused or neglected, it must be reported to Child Protective Services within 24 hours.

**How will we protect private information about you and your child, and the information we collect about your child?**

We will treat your identity and that of your child with professional standards of confidentiality and will protect your and your child’s private information to the extent allowed by law. We will do this by keeping records anonymously; students will be assigned a number so that their name will not be associated with the study in any way. We will not use your name or your child’s name or other information that could identify you or your child in any reports or publications that result from this study.

**Do the researchers have monetary interests tied to this study?**

There are no monetary interests or financial gains tied to this study.

**Who can you contact if you have questions about the study or want to report an injury?**
At any time, if you have questions about this study or wish to report an injury that may be related to your child’s participation in this study, contact Bethany Sheridan at (908) 907-7891, or Ken Coll at (775) 784-4345.

**Who can you contact if you want to discuss a problem or complaint about the research or ask about your child’s rights as a research participant?**

You may discuss a problem or complaint or ask about your child’s rights as a research participant by calling the University of Nevada, Reno Research Integrity Office at (775) 327-2368. You may also use the online *Contact the Research Integrity Office* form available from the *Contact Us page* of the University’s Research Integrity Office website.

**Agreement to be in the study**

If you agree to allow your child to be in this study, you must sign this permission form. We will give you a copy of the form to keep.

________________________________________
Child’s Name Printed

________________________________________
Signature of Parent/Guardian* Date

________________________________________
Signature of Person Obtaining Consent Date
Appendix H

Student Assent

Verbal Assent Script

Hi, my name is Ms. Sheridan. I’m going to tell you why I am talking to you. We are asking you to take part in a research study. We are doing the study because we want to learn more about how spending time in nature may affect you.

If you agree to be in this study you will be asked to answer a few questions before and after the study about how you feel about nature and your mood. You may be asked to go outside for guidance lessons. We will ask you to go outside for guidance for 2 months. Each guidance lesson will take about 30 minutes.

If you say “yes” to being in this study, your allergies might act up from being outside, or you could possibly be bitten by an insect. If you have an allergic reaction, get stung or bitten, you can tell your teacher or myself immediately so we can respond and help you. You should also tell your parents if you have an allergic reaction or get stung or bitten.

If you are in this study and feel any of the things I just talked about or feel bad in other ways, please tell your parents right away. It’s important they call us about what you are feeling.

Before you decide if you do or do not want to be in this research study, we want you to talk to your parents. We will also ask your parents to give their permission for you to be in this study.
Being in this study is up to you and no one will be upset if you don’t want to participate or if you change your mind later and want to stop. You can stop at any time for any reason. Nothing bad will happen and no one will mind.

If you have any questions about the study, please ask me now. If you have questions later you or your parents may call me at any time. My name is Ms. Sheridan and my phone number is 908-907-7891. You may also ask me questions about this study any time we meet. If you have a problem or complaint about the research or want to talk about your rights as a research participant, call the University of Nevada, Reno Research Integrity Office at 775.327.2368.

Printed Name of Child

Signature of Person Obtaining Assent Date

For researchers only:

Indicate how this child’s assent will documented:

EXTERNALLY

_PROVIDE

EXTERNALLY

Other, describe: