MOTHER NURTURE
HEALING STRESS THROUGH NATURE

A thesis submitted in partial fulfillment of the requirements
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by

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DEDICATION

To all who bathed in Earth’s waters, wandered through her grasslands and deserts, who sat atop her mountains, and were grateful to exist at all.
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ABSTRACT

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Marriage and Family Therapy

Since its emergence, therapy has been an indoor experience with the relationship between client and therapist at its core. However, Ecotherapy is a different approach to therapy, taking place within nature and this new area of psychology has been gaining attention in the mental health field. The current study investigated the benefits of this type of therapy and further strengthened the research evidence for Ecotherapy by studying 111 college students’ connectedness to nature, the amount of time they spent outdoors, and their frequency of stress symptoms. Results indicated that connectedness to nature affected how much time a student spent outdoors, and that connectedness to nature also influenced the frequency of stress symptoms that a student experienced. Also, the amount of time a student spent outdoors seemed to reduce the frequency of stress symptoms of the student. Implications for marriage and family therapists are discussed in detail.
CHAPTER 1 INTRODUCTION

_Treatment of the inner requires attention to the outer; or, as another early healer wrote,_

_“The greater part of the soul lies outside the body.”_

*James Hillman*

Since its emergence, therapy has been an indoor experience with the relationship between client and therapist at its core. However, there is a different approach to therapy, taking place within nature, viewing the environment not solely as a setting but as a partner in the therapeutic process and relationship (Berger & McLeod, 2006). Humans are relational beings whose meaning and purpose emerge from and in our relationships. The importance of relationships is one of the chief findings of psychology and ecology further illustrates that the natural world is intrinsically relational—no separate self or thing can ever be found because all things coexist dependently with all other things (Adams, 2006). Facilitating healing in nature is not a new concept; it reaches back to ancient times when people lived within communities in nature. Psychology, however, has floundered and has not taken the natural environment into account when understanding and facilitating the inner healing process.

Reflecting on psychology’s history, it is understood why psychology has not included the natural environment in the therapeutic process. Freud keenly steered psychology away from the outer world as he focused on the inner psyche. Speaking of ecology, he said, “Nature is eternally remote. She destroys us—coldly, cruelly, and relentlessly” (Roszak, 1995, p. 11). Psychology was the product of an urbanized mentality and attempted to rapidly adjust people to the standards of life in urban society, resulting in a type of psychotherapy that was separated from the planet (Roszak, 1992).
In Freud’s era, it was common for clients to have symptoms such as obscure obsessions or hysterical conversions based on repressed experience (Adams, 2006). Today, clients seem to be troubled by an unclear, overall sense that there is a basic lack in their existence; that something important is missing; that they are disconnected, alienated, and empty; that their lives are neither meaningful nor authentic (Loy, 2003). Since the Enlightenment and the Industrial Revolution, particularly in the West, people generally live in much healthier and more comfortable conditions, yet the great majority of them are deeply unhappy and the rest live frantic or meaningless lives (Burls, 2005). Some suggest that this increase in general unhappiness derives from never-ending, unfulfilled material needs (Burls, 2005). The basic needs of human beings—physical nourishment, nutritious food, continuity between work and meaning, unrestricted participation in life experiences, personal choices, community decisions, and a spiritual connection with the natural world—are not being met and their absence creates unhealthy people (Glendinning, 1995). In the absence of such basic needs, the psyche finds some relief and temporary satisfaction in pursuing secondary sources such as chemical substances, technological gadgets, and material possessions (Glendinning, 1995). While such things may satisfy people momentarily, true fulfillment of primary needs is simply not possible. In response to these unmet needs, dysfunctional behaviors often develop in order to satisfy secondary sources (Burls, 2005). And thus, the addictive process is born: we become obsessed with secondary sources at the expense of our connection with each other and with the Earth. The more we separate ourselves from nature, the emptier we feel and the more we compulsively try to fill our emptiness by consuming things that
require further destruction of the planet due to the unsustainable manner in which they are produced.

Mass consumption of secondary materialistic sources was sparked by the Industrial Revolution, and for the last two centuries, mass migration from rural to urban communities has resulted in 80% of people now living in urban areas (Wilson, Ross, Lafferty, & Jones, 2009). The literature suggests that this rapid transition has poorly prepared human beings to adapt to our current urban environment, and this is thought to have negatively impacted our physical and mental health (Wilson et al., 2009). Human beings have evolved within nature for millions of years, at nature’s rhythmic pace, and we are created to interact with our environment—with the air, water, fauna, and wildlife. But as indicated by the mass migration into urban areas, we have been steadily removed from the natural world, our lives regulated not by the sun or moon but instead by the factory clock (Walsh, 2009). Furthermore, prior to the Scientific Revolution, the attitude toward life was rooted in a powerful sense of connectivity: the individual was part of a family, which was part of a community, which was part of Earth, which was part of the universe. Each of these elements was connected to, embedded in, and interdependent upon the other and a change in one created a change in all (Eliade, 1959). On the contrary, psychotherapy as an institution was, and currently is, an expression of the dominant cultural preoccupation with the individual self. This form of self results in further separation from others, from the community, and from nature and this separation is apparent in today’s psychotherapy room (Watkins, 2009). For instance, many therapists practice who believe that urgent matters such as global warming have little or no impact on the inner psyche (Chalquist, 2006). Presently, Earth’s temperatures are rising
dangerously, 50% of species are at risk of extinction within 50 years, 27% of ocean reefs are gone, 84% of the planet surface has been interfered with, 100% of large rivers in the United States are polluted, governments are in the hands of oil barons, and mass advertising supports a planet-wasting economy (Chalquist, 2006). Therapists do not even think about such bleak facts, let alone inquire their clients about them (Chalquist, 2006).

The positive emotions and social benefits arising from the connection or reconnection with nature are still outside the repertoire of many mental health practitioners (Burls, 2005). Psychology, so dedicated to awakening human consciousness, needs to wake itself up to one of the most ancient human truths: we cannot be studied or cured apart from the planet (Hillman, 1995).

In the Western world, our relationship with the planet has been that of conquest and control. Such a need to conquer and manipulate may be explained by the division between human beings and the natural world which facilitates the human alienation from the environment, which leads to no feelings of remorse in conquering and exploiting the natural world (Roszak, 1970). Humans are viewed as not only separate from the natural world, but they act as though they are above and superior to it (Besthorn & Saleeby, 2003). Pyle (2005) states that the most dangerous idea in the world is that humans are separate from the rest of nature; the greatest violations against the Earth stem from such delusions, just as the us-and-them mentality justifies our inhumanity toward each other. Norton (2009) argues that our disconnection from nature in the form of detachment and domination is an attempt to avoid vulnerability. While this view has been supported and further fueled by a consumer culture, Norton (2009) argues that consumerism may be re-conceptualized as a search for comfort, security, status, and power, all in the hope of
avoiding this vulnerability. The evidence of our alienation is illustrated by ecological catastrophes such as loss of habitat and biodiversity, the extinction of species, overpopulation, global warming, and the poisoning of our air, water, and food (Adams, 2005). It is further demonstrated by growing rates of asthma associated with air pollution and cancers associated with toxins poisoning the environment (Adams, 2005). Although there have been other mass extinctions due to natural phenomena such as meteor strikes, the current crisis is unprecedented because it is being caused primarily by a single species (human beings) and culture (Western corporate-consumerist culture) (Adams, 2006). Additionally, our separation is manifested in clinical forms of anxiety, depression, narcissism, addiction, emptiness, acting out, and in our confusion over existential concerns regarding meaning, purpose, identity, and responsibility (Adams, 2005). Our alienation from nature is especially apparent in our denial of, or lack of concern for, these interconnected calamities. Due to the negative effects of our disconnection from the natural environment, the relationship between human beings and nature has received more and more recognition (Totton, 2003). Researchers have suggested that the split between human communities and the natural world contributes to a lack of psychological well-being and ultimately to emotional problems and poor health (Kuhn, 2001). The pain of the Earth—the extinction of species, the destruction of habitats, and the poisoning of the environment—contributes to collective and individual psychopathology. According to Adams (2006), we are terribly confused about who we are, what the natural world is, and what really matters.

The growing field of Ecopsychology attempts to understand this confusion in its social-therapeutic-environmental philosophy, asserting that reconnection with nature is
vital not only for the existence of the physical world (habitats, animals, plants, landscapes, and cultures) but also for humanity’s well-being and happiness (Berger & McLeod, 2006). Historian and cultural critic Theodore Roszak is credited with formally naming and charting the principles of Ecopsychology. Contemporary Ecopsychology can be understood as one of a number of environmentally-focused psychologies, including environmental psychology, conservation psychology, and ecological psychology, all of which assume that an understanding of human behavior and mental health requires the understanding of an environmental or ecological framework (Snell, Simmond, & Webster, 2011). Ecopsychology assumes that at its deepest level, the psyche is bonded to the Earth that mothered us into existence (Roszak, 1995). Roszak further argues that just as it has been the goal of previous therapies to uncover the repressed parts of the unconscious, the goal of Ecopsychology is to awaken the ecological unconscious, the innate sense of reciprocity between human beings and the planet (Snell et al., 2011). We can interpret our contact with the natural environment —the way we use or abuse the planet— as projections of unconscious needs and desires, in the same way we can interpret dreams and hallucinations to learn about our wants, fears, and hatreds (Roszak, 1995). As Freud claimed with his findings on the repressed parts of the unconscious, whenever something is dissociated, it will return to trouble us. It can be said that the domination of nature induces the return of the repressed through the pathological symptoms of environmental devastation and unexplained individual suffering (Adam, 2005). Therapy seeks to heal the disconnection between person and person, person and family, and person and society, whereas Ecopsychology seeks to heal the more fundamental disconnection between the person and the planet. When we experience
ourselves as an integral part of the natural world, we are able to help heal the Earth, and in turn, ourselves.

Our well-being relies upon the well-being of our family, community, culture, and society. Although it should be as clear, we are just beginning to see that the same is true of our relationship with the natural environment. Individual health is connected to the health of other beings and to the health of the Earth as a whole (Conn & Conn, 2009). Systems science challenges old assumptions about a separate self by showing that there is no logical or scientific basis for seeing one part of the experienced world as “me” and the rest as “other” (Macy, 2009). As open, self-organizing systems, our very breathing, acting, and thinking involve interaction with our shared world through the currents of matter, energy, and information that move through us and sustain us (Macy, 2009). Research shows that the same values and goals that tend to promote positive environmental outcomes are the same values and goals that are also associated with personal well-being (Doherty, 2009a). On the contrary, the same values and goals which destroy our planet are also associated with being less happy and having more distress (Doherty, 2009a). Thus, when people focus on materialistic or extrinsic goals for things like money, image, and status, not only do they engage in worse ecological outcomes but they report lower levels of happiness, lower levels of personal life satisfaction, lower levels of pleasant affect, more narcissism, more depression, and more anxiety (Doherty, 2009a). On the contrary, when people focus on intrinsic values which are goals for having a meaningful life and close relationships, or contributing to the community, the research shows people are happier, more satisfied with their lives, less depressed and less anxious, and tend to engage in more positive environmental behaviors (Doherty, 2009a).
The same things that are good for the planet are good for us and our well-being. Our values and defense mechanisms do not only impact our own well-being, but they impact other people’s well-being and the well-being of the planet as a whole. In this light, the principles of Ecopsychology can be applied to work with clients in the therapeutic, healing process.

Ecotherapy, applied Ecopsychology, refers to healing and growth nurtured by healthy interaction with the natural world (Buzzell & Chalquist, 2009). It is a form of psychotherapy that acknowledges the vital role of nature and addresses the human-nature relationship in the therapeutic process. Because people are not being informed about the link between mental health symptoms caused by the way they live and accelerating personal and planetary devastation, people remain bewildered about why they feel so much pain (Buzzell & Chalquist, 2009). Traditionally, the role of therapists has been to get the client back into the fast-paced world as quickly and as cost-effectively as possible; managed care says to diagnose the disorder, apply the proper treatment for the minimum number of sessions, and get the client back to his or her life (Robinson, 2009). When mental health practitioners treat clients in this way, they may relieve clients’ symptoms temporarily or teach them to better disguise their distress, but when therapists treat only the presenting problem and fail to address existential concerns, they deepen clients’ despair and sense of alienation (Robinson, 2009). According to Robinson (2009), Ecotherapy does not dwell on the questions What do I need? and How can I get it? Instead, it asks What is my place in the world? What particular gifts do I bring? and Are my natural needs being met with my current career and lifestyle?. Ecotherapy works on the soul; it involves awakening the senses to the beauty of Earth. Such therapy seeks to
reconnect people with themselves, with their communities, and with their environments, helping people flourish and promote social awareness (Burls, 2005). Each ingredient of nature—the elements, the wildlife, the terrain—has personal influence on the client, inviting the client to a deep therapeutic process. Nature is a part of the therapeutic relationship which can help the client create meaning and help guide the client through life transitions. The three-way relationship of client-therapist-nature can be used to explore a person’s thoughts and behaviors and help him or her reconnect to his or her body, soul, mind, and true self (Berger & McLeod, 2006). Working with a renewing environment can help a person regain hope and make positive changes in his or her life (Berger & McLeod, 2006). In this light, the use of Ecotherapy is a unique and alternative approach which broadens the scope of mental health practice. To support the benefits of working within a renewing environment, a growing body of international research has demonstrated the therapeutic benefits of contact with nature. It can enhance states of positive affect (Russell & Mehrabian, 1976), improve parasympathetic nervous system functioning (Ulrich, Dimbering, & Driver, 1991), increase physical health (Wright, 1983), reduce the length of time patients stay in the hospital (Ulrich, 1984), and reduce stress levels (Baum, Singer, & Baum, 1982).

Statement of the Problem

Stress is an especially vital factor to consider in our rapidly changing world. Americans are living in chronic stress, driven by an unquenchable thirst for more of the latest material possessions. This has had a negative impact on Americans; as a nation, we are more anxious, more depressed, and patterns of self-destructive behavior such as obesity and addiction are on the rise (Buzzell, 2009). In addition, our communities are
eroding and our leisure time is vanishing (Buzzell, 2009). Thus, it is not startling that findings from the American Psychological Association’s (APA) 2010 Stress in America survey show that most Americans are suffering from moderate to high stress, with 44% reporting that their stress levels have increased over the past five years (Clay, 2011). There is no question that the environment around people is a contributing factor to their stress, and with the Environmental Protection Agency stating that Americans spend nearly 90% of their time indoors (Knopper, 2005), it is reasonable to assert that quality time outdoors in nature has been replaced by the mechanical, technological ways of urban living. Given the research findings, one can assume that Americans’ broken bonds with nature are a significant factor in their increasing stress levels. Particularly vulnerable to stress are students: research has revealed that American students are out of shape (Ogden, Carroll, Curtin, Lamb, & Flegal, 2010), depressed as indicated by the rise in prescriptions for antidepressants (Delate, Gelenberg, Simmons, & Motheral, 2004), and a part of a nation which has become the largest consumer of Attention Deficit Hyperactivity Disorder medications in the world (Sax, 2000). Students are missing a vital connection to the natural world which they are physically and emotionally tied to, and they are suffering because of this disconnect.

**Purpose and Significance of the Study**

Due to the importance of the implications of such a disconnection, the current study will investigate the relationship between students’ connectedness to nature, how much time they spend outdoors and in the types of terrain, and how frequently they experience stress symptoms. The present study falls under the umbrella of Ecotherapy and hopes to contribute to the body of Ecopsychology literature, strengthening the case
for nature-centered therapy in the hopes that mental health practitioners with adapt ecotherapeutic techniques in their work with clients. Previous research states that emotional and psychological recovery from stress is thought to be achieved when viewing scenes eliciting feelings of interest, pleasantness, and calm. Natural environments are believed to elicit such feelings (Ulrich, 1983). While viewing the natural environment, negative affects are replaced by positive affects, negative thoughts are blocked, and sympathetic arousal declines (Ulrich, 1983). It is supported that maintaining a connection to nature, either through the presence of indoor plants or artwork depicting the natural environment or through direct immersion in nature, has been shown to decrease stress levels and stimulate healing (Jacobs, 2009). Nature gives people the chance to follow their interests and reduces pressures, fears, and social expectations (Jacobs, 2009). Based on such findings, the present study hypothesizes that the greater a student’s connectedness to nature and the more time the student spends outdoors, the fewer stress symptoms the student will experience. If students took the time to allow themselves to become immersed in nature, it is likely that they would feel a reduction in their stress. Thus, they would improve their overall health and well-being since people’s encounters with the natural world bring a sense of balance and relief from everyday stressors and renew a sense of belonging to a connection with a larger world (Chalquist, 2009). Although the benefits to well-being of contact with the larger, natural world have been proposed and expressed for many years, it is rather recently that these ideas have received empirical support in terms of quantitative findings (Doherty, 2009b).

The following empirical studies found in Chapter Two further support the claim that human beings cannot be healed apart from the natural environment. In Chapter
Three, the research design will be explained, illustrating the sample, instruments used, and procedures involved in the present study. Chapter Four will discuss what types of methods were used to test the hypothesis, indicate whether the results supported the hypothesis, and demonstrate major findings. Finally, Chapter Five will discuss the results in the light of the literature review and the study’s findings, identify areas of future research, and address implications for marriage and family therapists.
CHAPTER 2 REVIEW OF THE LITERATURE

Human beings possess an inborn need to connect with nature due to our evolutionary growth within it. For some individuals, gazing at the sunsets and mountains may inspire well-being despite difficult life circumstances (Frankl, 1963), and both research and theory have proposed that early experiences within nature may bring personal meaning to people’s lives (Gross & Lane, 2007). Our connection to nature is in our DNA and this is the heart of the biophilia hypothesis which was first defined in the early 1900’s medical dictionaries as the instinct for self-preservation or the instinctual drive to stay alive (Selhub & Logan, 2012). In the 1980’s, Harvard biologist Edward Wilson suggested that biophilia is an innately emotional connection of human beings to other living organisms (Selhub & Logan, 2012) and the field of psychology has started to awaken itself to this intrinsically emotional relationship.

After the scientific revolution and the development of modern therapy, Erickson, one of Freud’s leading students, used the encounter with nature not only for his personal healing but also for his clients; he would send them to the mountains as part of their healing process (Kinder, 2002). Years later, there is significant support to suggest that access to the natural environment can promote and maintain mental health, and over the past 20 years, research in this area has grown exponentially (Butler & Friel, 2006). The strength of this research evidence has even led to national and international policy considerations (World Health Organization, 1997). A significant implication of people’s innate inclination to positively respond to nature is that their attention is easily held by natural scenes, a notion referred to as soft fascination (Kaplan & Kaplan, 1989). Soft fascination has an important role in the restorative quality of nature: when nature captures
our attention, executive systems that regulate directed attention are able to rest, pessimistic thoughts are blocked, and negative emotions are replaced by positive ones (Parsons, 1991). Prolonged exposure to the natural environment may elicit reflections of one’s priorities and goals, which may help an individual find positive direction in his or her life (Mayer, Frantz, Bruehlman-Senecal, & Dolliver, 2009). People have a more positive outlook on life and higher life satisfaction when in proximity to nature, and having nature in close proximity or simply knowing that it exists is important to people regardless of whether they regularly immerse themselves in it or not (Maller, Townsends, Pryor, Brown, & St. Leger, 2006). Given such findings, the following review of the literature will further explore the benefits of the natural environment and illustrate the value of horticultural therapy and outdoor exercise, address the implications of nature therapy, the importance of access to greenspace, the restorative benefits of nature, and finally, demonstrate how nature can be a protective buffer against stress.

**Review of the Research**

Butler and Friel (2006) report that since 1986, the evidence linking physical and mental health to ecological and environmental factors (i.e., climate change and the loss of biodiversity) has greatly strengthened, creating a new area of study—Ecopsychology. However, they also believe that recognition of the significance of ecological and environmental factors has simultaneously decreased among the supporters of human physical and mental health. In this light, the review of the research may have important implications for practicing mental health professionals who wish to incorporate the following Ecopsychology factors into their work with clients.
The Healing Garden: Horticultural Therapy

Human beings’ use of the natural environment has varied throughout the centuries as it has reflected diverse cultures’ beliefs and values. From the latter part of the 17th century until the middle of the 20th century, nature was an essential component of the healing process in a number of hospital settings such as sanatorium parks (Soderback, Soderstrom, & Schalander, 2004). For instance, at the Horticultural Therapy Garden at the Danderyd Hospital Rehabilitation Clinic in Sweden, 46 patients with brain damage who participated in group horticultural therapy were studied (Soderback et al., 2004). The patients, aged 18-65 years old, suffered from pain- or movement-related injuries, and/or cognitive impairments, and/or were clinically depressed. As part of treatment, the patients were given the option to garden as one of several self-selected activities during the sessions. The results of this treatment indicated that horticultural therapy mediated emotional, cognitive, and/or sensory motor functional improvement, and increased social participation, health, well-being, and life satisfaction (Soderback et al., 2004). The researchers noted, however, that the effectiveness of horticultural therapy needed further investigation given the small sample size in this study.

Research by Hine, Peacock, and Pretty (2008) further investigated the benefits of a healing garden, a restorative environment, which promotes recovery from attention fatigue by allowing people to relax, to free their minds, and to distance themselves from ordinary life stressors in order to help them concentrate and think more clearly. Such green care in agriculture, known as care farming, is defined as the use of commercial farms and agricultural landscapes as a place for promoting mental and physical health through common farming activities (Hine et al., 2008). A questionnaire survey was
forwarded to all members of the National Care Farming Initiative network in the United Kingdom and further distributed to city farms with the hope of reaching as many care farms as possible. A total of 76 care farms returned the questionnaire, compromising 19 city farms, 16 independent farms, and 41 farms linked to external institutions or charities. The results indicated that the majority (83%) of care farms catered for people with learning difficulties, over half (51%) of farms provided service for disaffected young people, and nearly half (49%) of care farms catered for people with mental health needs (Hine et al., 2008). The mental health benefits specified by the care farmers included: improved self-esteem (93% of farms), improved well-being (92% of farms), improvement in mood (83% of farms), an increase in self-confidence and enhanced confidence or trust in other people, and calmness (Hine et al., 2008). Although significant, the results were from the United Kingdom and thus there may be generalization limits to these research findings.

Drawing upon research of this kind, the Boulder Crest Retreat for Wounded Warriors, a project planned to be finished by winter 2013, will be a non-profit retreat featuring nature-focused therapeutic techniques to give America’s military men and women suffering from physical and mental injuries a calming, re-energizing place to visit for free (Manning, 2011). It will offer therapeutic exercises, including horticultural therapy, where visitors can dig the Earth since gardening provides people with physical and psychological well-being. According to Manning (2011), the availability of horticulture can reduce some of the Post-Traumatic Stress Disorder symptoms which include anxiety and intrusive thoughts, and keep veterans away from substance abuse. Horticultural therapy also helps develop communication skills and self-esteem, and in
addition to gardening, participants will also visit with therapy dogs and participate in outdoor activities such as hiking and kayaking. The creation of such a nature-based retreat illustrates that the benefits of the natural environment are being taken into consideration on a larger scale; the public is starting to pay attention to the benefits of being outdoors.

**Outdoor Exercise**

People often associate being outdoors with exercise and studies clearly illustrate the benefits of green exercise on the human body and psyche. For instance, researchers analyzed data from a number of sources which included 11 randomized and non-randomized control trials including data from 833 adult participants (Thompson Coon et al., 2011). Compared with exercising indoors, exercising in natural environments was associated with greater feelings of revitalization, increased energy and positive engagement, together with a decrease in tension, confusion, anger, and depression (Thompson Coon et al., 2011). Participants also reported greater enjoyment and satisfaction with outdoor activity and stated that they were more likely to repeat the outdoor activity. However, none of the identified studies measured the effects of physical activity on physical well-being or the effect of natural environments on following through on exercise.

According to theory, green exercise works through natural and social connection, sensory stimulation, activity, and escape (Mind, 2007). In doing so, green exercise enhances mood and self-esteem, reduces feelings of anger, tension, and depression, and also facilitates social connectivity (Mind, 2007). Therefore, Ecotherapeutic treatment options should be considered clinically valid, however, despite the strong evidence
supporting the therapeutic role of green exercise and the impact of the natural environment on both physical and mental well-being, few mental health professionals currently regard Ecotherapy to be as effective as other forms of treatment (Mind, 2007).

**Nature Therapy**

Nature therapy is a valuable treatment option because it allows clients to connect to the cycles of nature which can help them bond with parallel processes in their lives and relate their individual situations in a universal context (Berger & Lahad, 2010). For example, an encounter with a traveling bird, a dead reptile, or a blossoming plant can express a similar story within a client’s life (Berger & Lahad, 2010). When clients are able to relate their situation with the natural cycles of the Earth, they are able to learn that their situation is a part of a greater, broader universal connection.

Based on a qualitative case study conducted with a group of children with learning difficulties, Berger (2008) presented a way in which therapy can take place creatively in the natural environment. Using participants’ responses to a three-hour interview in which the participants were asked to reflect on the year’s nature therapy protocol, the study offered mental health practitioners concepts and methods that could be incorporated into their practice. The diverse situations in which the children and therapists were in were dictated by nature; an ever-changing environment that was not within their control or ownership. This was one of the most significant elements of the therapeutic process because it brought up the issue of coping with the uncontrollable and unexpected, and promoted flexibility and expanded coping mechanisms (Berger, 2008). It allowed the children to work on the issue of fear and further work on issues such as cooperation, intimacy, and leadership.
Qualitative research by Doucette (2004) further explored nature therapy by investigating if preadolescent and adolescent youths with behavioral challenges benefit from a multimodal intervention of walking outdoors while engaging in counseling. The objective of the Walk and Talk intervention was to help the youth feel better, explore alternative behavioral choices, and learn new coping strategies and life skills by engaging in a counseling process that included the benefits of mild aerobic exercise and that cultivated a connection with nature. For eight weeks, eight students (ages 9-13) from a middle school in Alberta, Canada participated in weekly Walk and Talk sessions. Students’ self-reports indicated that they benefited from the intervention, and the results indicated that the students were making pro-social choices in behavior and were experiencing more feelings of self-efficacy and well-being (Doucette, 2004). These findings, however, cannot be generalized given the small sample size.

Another form of nature therapy is Outdoor Behavioral Healthcare (OBH), an emerging treatment that utilizes wilderness/adventure therapy to help adolescents struggling with behavioral and emotional problems. This approach involves immersion in wilderness, shared living with wilderness leaders and peers, and individual and group therapy sessions facilitated by licensed mental health professionals. OBH also offers psychoeducational curriculum designed to reveal and address problem behaviors, cultivate personal and social responsibility, and enhance the emotional growth of clients (Russell, 2003). Each year, more than 100 OBH programs in the United States serve more than 10,000 clients and their families (Russell, 2003). OBH programs take an empathetic and self-discovery approach to working with troubled adolescents compatible with basic counseling approaches (Russell & Phillips-Miller, 2002). Key therapeutic
factors that distinguish OBH from other counseling approaches found to be effective in treating adolescents with a variety of emotional and behavioral disorders include: the promotion of self-efficacy through task accomplishment facilitated by natural consequences in wilderness living, a restructuring of the therapist-client relationship, and promotion of group cohesion and development through group and outdoor living (Russell, 2003). To support these claims, Russell (2003) studied adolescent clients who received treatment in seven participating OBH programs that averaged 45 days in length. Adolescent clients’ well-being was evaluated utilizing the Youth Outcome Questionnaire and the Self Report Youth Outcome Questionnaire. Complete data sets at admission and discharge were collected for 523 client self-reports and 372 parent assessments. Results indicated that at admission clients exhibited presenting symptoms similar to inpatient samples, which were on average significantly reduced at discharge. Follow-up assessments using a random sample of clients found that, on average, outcomes had been maintained at 12-months post-treatment, supporting the significance of the initial findings.

Another significant study was done by Greenway (1995) who studied more than 1,380 individuals who passed through his wilderness program. Greenway (1995) collected and analyzed 700 questionnaires and 700 interviews as well as more than 300 personal responses to the wilderness trips. Some of the descriptive statistics from this analysis included: 90% of the respondents described an increase in aliveness, well-being, and energy; 90% stated that the experience allowed them to break an addiction (defined very broadly—from nicotine to chocolate to other foods); and, 77% described a major life change upon return (in personal relationships, employment, housing, or lifestyle).
Although these were self-reports, given the large sample size, the study has significant support for the benefits of nature therapy.

Furthermore, the literature on wilderness/adventure therapy shows that social skills are enhanced which include: leadership, trust, ability to deal with anxiety and fear, and team building (Wilson, Ross, Lafferty, & Jones, 2009). However, existing studies on the effectiveness of wilderness/adventure therapy reveal methodological limitations and results that are difficult to replicate. Regardless, the findings illustrate that there is a powerful connection between people’s well-being and greenspace.

**Access to Greenspace**

Generally, people who live in areas that lack greenspace may be more vulnerable to the negative impacts of stressful life events because they have fewer opportunities for nature-based coping strategies than people who live in areas with plentiful greenspace (van den Berg, Mass, Verheij, & Groenewegen, 2010). In one of the first quantitative investigations of the relationship between the amount of greenspace in the environment and perceived health, De Vries, Verheij, Groenewegen, and Spreeuwenberg (2003) compared land use data with self-reported health questionnaires. Gender, age, the number of major life events in the previous year, and a number of indicators of socioeconomic status were controlled for, and an attempt was made to account for the fact that the measures were taken in different years by removing participants’ information who had moved within the last year. Analysis of the remaining 10,197 respondents showed a significant positive relationship between the amount of greenspace in the living environment and self-reported health (De Vries et al., 2003). Although how much the respondents actually used the greenspace which they had access to was not taken into
account, the study represented pioneering evidence that nearby greenspace was related to public health.

To further support the relationship between greenspace and health, more than 1,200 employees at various corporations and state agencies were surveyed and results indicated that office workers with a window view of nature—trees, bushes, or a large lawn—experienced significantly less frustration and more enthusiasm for their jobs than workers without windows (Gorrell, 2001). Research also demonstrated that workers’ idea generation, creative performance, and problem solving skills considerably improved in work settings that included flowers and plants (“University research,” 2007). Further, residents’ quality of life based on the extent of their contact with trees showed that residents living near trees felt happier with where they lived and were better adjusted to their environment than those with no trees growing nearby (Gorrell, 2001). These findings have important implications because they suggest that mental health benefits do not require living in the wild, but simply require having access to greenspace.

Mental health benefits were not the only benefits as illustrated by a randomized control trial among post-surgical patients. Ulrich (1984) found that those patients with windows to a natural view spent significantly less time in the hospital than those patients whose windows looked out onto a brick wall. Furthermore, Moore (1981) compared prisoners and found that lower frequency of headaches, digestive illness, and sick calls were noted when prisoners’ cells had windows with a natural view. Tennessen and Cimprich (1995) compared 72 university students, unequally split into groups, by the view they had from their dormitory windows. Those with a view of nature scored significantly better on two separate measures of directed attention than those with non-
natural views. The experiment was, however, limited by the lack of baseline measures, the small sample in the natural views, and the inability to remove other distractions in the dormitories. Finally, Kuo and Sullivan (2001) interviewed 145 women who had been randomly assigned to identical apartments within a large public housing development in Chicago. The only difference between the apartments was their view of and access to greenspace. Kuo and Sullivan (2001) reported that those who had greater access to greenspace demonstrated significantly lower levels of aggression and violence, and further demonstrated improved levels of concentration when compared to those without greenspace access. Using the same population, Kuo (2001) found a significant relationship indicating that individuals with greater access to greenspace assessed their life problems as less severe and enduring, indicating less mental fatigue.

Greenspace has been reported to be the great equalizer— it has the potential of filling in, to a significant degree, the gap in health inequalities between more affluent people who have more access to a higher quality of life and the people who are struggling at the lower end of the socioeconomic scale (Selhub & Logan, 2012). Researchers at the University of Glasgow, Scotland, compared a land-use database for greenspace and mortality records and found an association between residence in the greenest areas and lower rates of death (Selhub & Logan, 2012). Greenspace is an independent variable capable of saving thousands of lives per year in lower-income communities (Selhub & Logan, 2012), which has significant implications for mental health professionals working with clients from poorer communities. Greenspace can provide an opportunity for physical activity as well as social connectivity, and merely being in nature for brief periods —or having a view of it— can reduce stress hormone production and improve
immune defense, indicating that the natural environment has restorative qualities (Selhub & Logan, 2012).

**Restorative Benefits of Nature**

Investigating the role of environmental preferences, van den Berg, Koole, and van der Wulp (2003) studied 106 student participants (67.9% female, mean age 21.9 years) from Wageningen University in The Netherlands. Participants viewed a frightening movie and then were shown a video of either a natural or a built environment. Participants’ mood ratings were assessed before and after they viewed the frightening movie, and again after viewing the environmental video. Participants provided baseline ratings on a set of 21 adjectives measuring the subscales depression, anger, and tension. Additionally, the students expressed their total happiness and overall level of stress scores, and also rated the beauty of the environment shown (rating the environments on several characteristics to indicate preference) and performed a test of concentration (using the Mental Concentration Test) after viewing the environmental video. The results indicated that participants perceived the natural environments as more beautiful than the built environments. In addition, viewing natural environments elicited greater improvement in mood and better concentration than viewing built environments. The study found that exposure to a natural environment was associated with more positive changes in mood state and better performance on a concentration test than exposure to a built environment. It is believed that the participants’ identification with the natural environment played an important factor in these results.

St. John and MacDonald (2009) assessed the concept of the ecological self, the extent to which individuals identify with nature. Since the boundaries of self are flexible
and permeable, they may include a sense of oneness or unity with the world, and ultimately with the larger universe (St. John & MacDonald, 2009). Using a sample of 150 university students, an 11-item instrument, compromised of two subscales (nature inclusive self-concept and nature stewardship) was constructed through both exploratory and confirmatory factor analytic techniques. The instrument was found to have adequate inter-item reliability and satisfactory convergent, discrimination, and criterion validity. Correlational and regression analyses found that the two subscales were significant predictors of mental and spiritual well-being. It is assumed that the deeper an individual’s relationship with nature is, the better he or she will function (St. John & MacDonald, 2009). However, a limitation in this research is that it used a sample made up exclusively of college students of largely Christian backgrounds, which creates concerns about the generalization of the findings.

In an experiment by Hartig, Mang, and Evans (1991), 34 college students were randomly assigned to one of three conditions: a nature walk, a walk in an urban settling, or relaxation. Pre- and post-measures on the Zuckerman Inventory of Personal Reactions and Overall Happiness Scale were used to measure emotional restoration. Those participants assigned to a nature walk demonstrated significantly lower levels of anger and aggression than participants assigned to other conditions. Measures of overall happiness, perceived restoration, and positive affect were also significantly higher in this group, which supports that nature has restorative benefits.

In another study, 20 participants were exposed to walks of equal length in either woodland or urban settings (Mind, 2007). Pre- and post-measures of self-esteem and mood were taken using the Rosenberg Self-Esteem Scale and the Profile of Mood State
questionnaire. Statistically significant improvements in self-esteem and overall mood change (depression, anger, tension, confusion, fatigue, and vigor) were evidenced between the experimental conditions, with greater improvement among participants exposed to walks in woodland settings. Although the results were considerable, indicating that 71% reported depression decrease after the woodland walk while 22% reported depression increase after the urban walk, generalization of these findings cannot be made due to the small size of the sample. Despite this, the research evidence of nature’s restorative effects has implications for mental health practitioners who wish to include nature therapy as a valuable treatment option for clients who are dealing with a wide variety of mental distress such as stress.

**Nature as Buffer Against Stress**

Given the high stress levels that Americans are experiencing as indicated by the American people ranking fifth among 151 nations on stress, and the fact that one out of every two North Americans can now anticipate meeting the criteria for a mental health disorder (Selhub & Logan, 2012), research conducted by Korpela and Kinnune (2011) is especially important. The researchers compared the importance of spending time in interacting with nature to other leisure activities in regards to recovery from employment demands. Employees of five organizations answered a 12-page questionnaire including portions about work and well-being, work recovery and leisure activities, personal resources, health and sleep, and background variables. Of the 527 participants, (53% female, mean age 42.4 years) most participants (77%) were living with a partner, 43% had children living at home, and the majority (60%) had an academic degree. The results illustrated that exercise and being outdoors during free-time was the most effective
activity for recovery from work stress and the time spent in interacting with nature was second in importance.

Another study investigated whether the presence of greenspace can ease negative health impacts of stressful life events (van den Berg et al., 2010). Individuals’ information on health and sociodemographic characteristics was drawn from a representative two-stage sample of 4,529 Dutch respondents to the second Dutch National Survey of General Practice. Health measures included the number of health complaints in the last 14 days, perceived mental health, and a single-item measure of perceived general health ranging from “excellent” to “poor.” Percentages of greenspace in a 1-km and 3-km radius around the home were derived from the 2001 National Land Cover Classification database. Data was analyzed using multilevel regression analysis, and all analyses were controlled for age, sex, income, education level, and level of urbanity. The results illustrated that the relationship of stressful life events with the number of health complaints and perceived general health were significantly moderated by the amount of greenspace in a 3-km radius. Participants with a high amount of greenspace in a 3-km radius were less affected by experiencing a stressful life event than participants with a low amount of greenspace in this radius. The same pattern was true for perceived mental health, although it was less significant. Such results support the notion that greenspace can provide a buffer against the negative health impact of stressful life events.

Research by Wells and Evans (2003) further focused on nature as a buffer against stress, but the participants of this study were rural children. To examine whether vegetation near the residential environment might buffer or moderate the impact of
stressful life events on children’s psychological well-being, data was collected from 337 rural children in grades three through five (mean age 9.2 years). Dependent variables included a standard parent-reported measure of children’s psychological distress and children’s own ratings of global self-worth. In a rural setting, levels of nearby nature moderated the impact of stressful live events on the psychological well-being of children. Particularly, the impact of life stress was lower among children with high levels of nearby nature than among those children with little nearby nature. The psychological effects of stressful life events such as family relocation, being picked on or punished at school, or being subject to peer pressure varied depending on the amount of nearby nature to which the children had access to (Wells & Evans, 2003). These results were significant because, unlike prior research, they provided support of nature’s buffering effect, indicating that the impact of life stress varies depending on the levels of nature exposure. Additionally, the study claimed that researchers are also exploring the idea that environmental characteristics may serve as protective factors and contribute to resilience in children.

To examine nature’s buffering effects against stress on college-aged students, Ulrich (1979) decided to examine the mental influences of nature scenes on stressed students. After taking a required one-hour course exam in a windowless room, 46 students volunteered to participate in psychological tests and then viewed approximately 50 slides. After they answered the psychological questions, the students were split into two groups: one group viewed natural settings devoid of buildings, while the other group viewed urban retail and industrial buildings that did not have graffiti or litter present. Images of people and animals were not included in the slides. The psychological testing
demonstrated that although students were stressed and frazzled after their hour-long exam, their mental states and outlook after viewing the two types of environments were striking: the nature scenes increased positive affect (feelings of affection, playfulness, friendliness, and delight were elevated) in the group that viewed various nature settings; however, the group of students who viewed the urban scenes significantly cultivated one emotion: sadness (Ulrich, 1979). The nature scenes had the tendency to decrease feelings of anger and aggression and the urban scenes had the tendency to increase such feelings. Given the universal agreement among health practitioners about the detrimental effects of stress on physical health, these findings have important implications. However, the study requires further replication and validation.

To further study nature’s effect on human beings, Ulrich (1981) examined how nature scenes might influence stress physiology and brain activity. Setting up a similar experiment as the previous one but with unstressed healthy adults, Ulrich (1981) used an electroencephalograph (EEG) apparatus to measure brain activity. The results illustrated that viewing scenes of nature was associated with higher alpha wave amplitudes which are associated with increased serotonin production. Almost all antidepressant medications are thought to work by enhancing the availability of serotonin (Selhub & Logan, 2012), which has valuable implications for mental health practitioners who work with clients who do not wish to take antidepressants in order to feel better. Instead, clients have the option to immerse themselves in nature to improve their mood.

Parsons, Tassinary, Ulrich, Hebl, and Grossman-Alexander (1998) studied whether stress recovery and/or immunization varies as a function of the roadside environment. To accomplish this, the researchers studied 160 college-aged participants
who viewed one of four different video-taped stimulation drives through outdoor environments immediately following and preceding mildly stressful events. Results indicated that participants who viewed urban-dominated drives, compared to participants who viewed nature-dominated drives, showed greater autonomic activity signifying stress (e.g. elevated blood pressure and electrodermal activity) and showed altered somatic activity signifying greater negative affect (e.g. elevated electromyographic activity). In addition, participants who viewed nature-dominated drives experienced faster recovery from stress and greater immunization to consequent stress than participants who viewed urban-dominated drives. The findings of field studies are supported by laboratory experiments in which stressed participants are arbitrarily assigned to conditions of viewing visual replications of natural and urban environments (van den Berg et al., 2010). These experiments have consistently shown that viewing slides or videos of natural environments leads to a quicker and more complete stress recovery than viewing urban environments. There is convergent confirmation from diverse types of research that contact with, and immersion in, real or virtual natural environments can provide restoration from stress and mental fatigue (van den Berg et al., 2010). Contact with and/or immersion in nature offers healing benefits which include clearing the mind, recharging directed attention capacity, reducing internal noise, and eliciting reflections on one’s life, on one’s priorities and possibilities, and on one’s actions and goals (Kaplan & Kaplan, 1989).

**Synthesis of the Review of the Research**

Given such findings, the reviewed literature focuses on the self-world connection— the notion that improving mental health is not possible without also
considering the world in which we live. From an evolutionary perspective, it is sensible to imagine that human beings have an affinity for settings which are beneficial, therapeutic, and/or healthy since an organism must prefer those environments in which it is likely to survive and flourish (Wells & Evan, 2003). A remarkable finding is that people do not need to go outdoors to benefit from nature’s restorative functions; purely viewing greenspace through a window can produce restorative effects for the individual (Faber Taylor, Kuo, & Sullivan, 2002). Much of this research is pioneer work, and thus, replications of the studies are important in order to strengthen the Ecopsychology research evidence. The reviewed research supports the development of the hypothesis of the present study since the literature illustrates that human well-being is understood, at least in part, to be the product of our acceptance of the fundamental union between ourselves and the natural world (St. John & MacDonald, 2009). Based on previous findings, the hypothesis of the present study states that the greater a student’s connectedness to nature and the more time the student spends outdoors, the lower his or her frequency of stress symptoms will be. This hypothesis will be conducted by using the Connectedness to Nature Scale (Mayer & Frantz, 2004) and original scales measuring time spent outdoors and the frequency of stress symptoms. The subsequent chapter will illustrate how this hypothesis will be implemented.
CHAPTER 3 METHODS

Students are missing a vital connection to the natural world which they are emotionally and physically a part of and they are suffering because of this disconnect. In this light, the current study will explore this disconnect by investigating the relationship between students’ connectedness to nature, the amount of time they spend outdoors, and how frequently they experience stress symptoms. The present study falls under the umbrella of Ecotherapy, applied Ecopsychology, which is a form of psychotherapy that recognizes the role of the natural environment and is concerned with the human-nature relationship. The current study hopes to contribute to the body of Ecopsychology literature, strengthening the research evidence for nature-centered therapy. The purpose of the present study is to see if there is a connection between students’ connectedness to nature, the amount of time students spend outdoors, and their stress symptoms. Based on previous findings, the present study hypothesizes that the greater a student’s connectedness to nature and the more time the student spends outdoors, the lower his or her frequency of stress symptoms will be. The current chapter will illustrate how this hypothesis was tested, first discussing the research design, the participant sample, instruments, and finally the procedure.

Design

The research design was of the between-participants variety since variation in observations came from differences between participants at a single point in time. The study employed a one-shot experimental design as it involved quantitatively studying the relationships among the variables in the study. It is important to note that cause and effect relationships were not able to be determined using this design.
Data were collected on the following constructs: (a) connectedness to nature, (b) time spent outdoors, and (c) stress symptoms. The study examined the relationship among these constructs using correlational analysis, as well and the relationship of each construct with the respondent’s age. Here, the independent variables were age, connectedness to nature, and time spent outdoors, and the dependent variable was the frequency of stress symptoms. Through survey research the participants were given questionnaires asking about: (a) their connectedness to nature, (b) how much time they spend outdoors, and (c) their frequency of stress symptoms. Items were averaged to create composites and the internal-consistency reliability of these composite scales was assessed using Cronbach’s alpha (α), which is a measure of internal-consistency reliability as well as unidimensionality of the estimated construct.

Participants

The sample included participants who were undergraduate and graduate students from California State University, Northridge. The demographic characteristics of the participants illustrated a total of 111 students who participated in the study, of whom 91 were female and 20 were male. The participants’ age ranged from 19 to 62 years old, with a mean age of 26.62 years. A total of 68 undergraduate students and 43 graduate students participated in the study. The 68 students were from an undergraduate psychology class and of the 43 graduate students, 25 were from a teaching credential class and the remaining 18 were from a school psychology class. The basis for participation was voluntary and course credit was given if it was applicable. No other demographic data was collected. The participants were recruited through their professors, who were e-mailed by the researcher, asking for permission to use class time to conduct
the research. See Appendix A to view the invitation email. A screening device was not used to select from a wider participant pool, and deception was not a part of the procedure since it was not important for the purposes of the study. Also, it was likely that the participants would be able to understand the purposes of the study, that is, to see if there is a relationship between one’s connection to nature, one’s time spent outdoors, and one’s stress symptoms by simply viewing the questionnaire material.

**Instruments**

The hypothesis of the study states that the greater a student’s connectedness to nature and the more time the student spends outdoors, the lower his or her frequency of stress symptoms will be. The independent variables were connectedness to nature and time spent outdoors. The Connected to Nature Scale (CNS) used in the study was originally developed by Mayer and Frantz (2004) and the Time Spent Outdoors Scale was developed by the researcher of the present study. The dependent variable was the frequency of stress symptoms as defined by the Stress Symptoms Scale, which was also developed by the researcher. Refer to Appendix B to view the complete data collection instruments.

The Connectedness to Nature Scale used in the study provided a measure of an individual’s trait levels of feeling emotionally connected to the natural world and it was designed to measure the extent to which an individual generally felt a part of the natural world and emotionally connected to it (Mayer & Frantz, 2004). The measure consisted of 14 items rated on a 7-point Likert Scale, with a rating ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). Items 4, 12, and 14 were reverse-coded and averaged, and the total scale score ranged from 14 to 70 with higher scores reflecting a higher degree of
connectedness to nature. The Time Spent Outdoors Scale provided a measure of individuals’ frequency of time spent in different types of terrain (for example, the ocean, mountains, forest, etc.) The measure consisted of 7 items rated on a 6-point Likert Scale, with a rating ranging from 1 (never) to 6 (very frequently) with higher scores reflecting more time spent outdoors. The Stress Symptoms Scale provided a measure of individuals’ frequency of experiencing stress symptoms (for example, memory problems, anxious thoughts, feeling overwhelmed, etc.). The measure consisted of 20 items rated on a 6-point Likert Scale, with a rating ranging from 1 (never) to 6 (very frequently). Higher scores reflected a higher frequency of experiencing stress symptoms.

Pearson Product-Moment Correlations among the scales were estimated from the data collected. These scales, however, are assumed to have measurement error which attenuates the correlation, making them lower. In order to adjust for the bias in the correlations, Spearman’s Correction for Attenuation formula was used to adjust scores (and in turn the correlations) for measurement error. Correlations resulting after the application of Spearman’s correction formula are referred to as *disattenuated* correlations. Such correlations can be interpreted as being free of measurement error. Spearman’s Correction for Attenuation formula is as follows:

\[
\rho_{XY} = \frac{r_{XY}}{\sqrt{r_{XX} \cdot r_{YY}}},
\]
where: \( \rho_{xy} \) = disattenuated correlation
\( r_{xy} \) = Pearson product-moment correlation
\( r_{xx'} \) = internal-consistency reliability estimate for X
\( r_{yy'} \) = internal-consistency reliability estimate for Y

The intention of this research was not to arouse any threat or anxiety to the participant; therefore, minimal risk was involved. However, it was impossible for the researcher to anticipate individual differences, thus, the survey may have induced positive or negative feelings for the participants and the participants were informed that they may stop the survey at any time since participation was voluntary. Each participant was asked to provide his or her age, sex, and student status (i.e., undergraduate or graduate). No further identifiable information was collected and the data were collected anonymously. The participants wrote and signed their names on the Adult Consent Form and signed their names on the Bill of Rights form. These forms, along with the instrument materials, were kept in the researcher’s home office, in a secure cabinet, and no one had access to these records but the researcher and members of the advising committee. Final disposal of all data took place after the results were officially completed.

**Procedure**

Once the researcher obtained permission through e-mail from university professors to visit undergraduate and graduate classes to conduct the study, the approximately 25-minute procedure took place. Upon walking into the university classroom, the researcher introduced herself as a Marriage and Family Therapy graduate student and stated that she is investigating people’s relationship to nature, the natural
environment. The only requirement to participate in the study was to be at least 18 years of age, and course/research credit was granted to the students to whom this was applicable. Participants were informed that there was minimal risk involved, that their participation was voluntary, and that they were welcome to stop the study at any time without negative consequences. After distributing the Adult Consent Form (see Appendix C) and the Participant Bill of Rights (see Appendix D), and after collecting the Adult Consent Form and the Participant Bill of Rights, the data collection materials were handed out to the students to complete. The researcher indicated that there were no right or wrong answers, asking the students to be truthful in their responses. There were also no identifying features on the data collection materials, thus, students would not be identified. Upon collecting the completed questionnaire materials, the researcher debriefed the participants, stating the hypothesis of the study and the importance of such research. For a full script of the procedure including the debrief, refer to see Appendix E. After collecting the materials, the data was processed and analyzed using the Statistical Package for the Social Sciences (SPSS) version 19.
CHAPTER 4 RESULTS

Based on previous findings, this study hypothesizes that the greater a student’s connectedness to nature and the more time the student spends outdoors, the lower his or her frequency of stress symptoms will be. The current chapter will illustrate the results of this study, discuss the major findings, and detail whether the results supported the hypothesis.

Research Findings

The overarching hypothesis of this study states that the greater a student’s connectedness to nature and the more time the student spends outdoors, the lower his or her frequency of stress symptoms will be. This hypothesis was tested using means and correlations, while establishing the internal-consistency reliability of the scales using Cronbach’s alpha (α). The following sections present the results of descriptive statistical analysis for all the variables and scales used in the study.
Table 1

**Descriptive Statistics for the Connectedness to Nature Scale**

<table>
<thead>
<tr>
<th>Item</th>
<th>N</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I often feel a sense of oneness with the natural world around me.</td>
<td>111</td>
<td>1</td>
<td>7</td>
<td>4.87</td>
<td>1.43</td>
</tr>
<tr>
<td>2. I think of the natural world as a community to which I belong.</td>
<td>111</td>
<td>1</td>
<td>7</td>
<td>5.01</td>
<td>1.38</td>
</tr>
<tr>
<td>3. I recognize and appreciate the intelligence of other living organisms.</td>
<td>111</td>
<td>3</td>
<td>7</td>
<td>5.95</td>
<td>1.06</td>
</tr>
<tr>
<td>4. I often feel disconnected from nature.</td>
<td>111</td>
<td>1</td>
<td>7</td>
<td>2.72</td>
<td>1.48</td>
</tr>
<tr>
<td>5. When I think of my life, I imagine myself to be a part of a larger cyclical process of living.</td>
<td>111</td>
<td>1</td>
<td>7</td>
<td>4.96</td>
<td>1.71</td>
</tr>
<tr>
<td>6. I often feel a kinship with animals and plants.</td>
<td>111</td>
<td>1</td>
<td>7</td>
<td>4.87</td>
<td>1.71</td>
</tr>
<tr>
<td>7. I feel as though I belong to the Earth as equally as it belongs to me.</td>
<td>111</td>
<td>2</td>
<td>7</td>
<td>4.86</td>
<td>1.50</td>
</tr>
<tr>
<td>8. I have a deep understanding of how my actions affect the natural world.</td>
<td>111</td>
<td>1</td>
<td>7</td>
<td>5.48</td>
<td>1.45</td>
</tr>
<tr>
<td>9. I often feel part of the web of life.</td>
<td>110</td>
<td>2</td>
<td>7</td>
<td>5.04</td>
<td>1.45</td>
</tr>
<tr>
<td>10. I feel that all inhabitants of Earth, human and non-human, share a common “life force.”</td>
<td>111</td>
<td>1</td>
<td>7</td>
<td>5.35</td>
<td>1.62</td>
</tr>
<tr>
<td>11. Like a tree can be part of a forest, I feel embedded within the broader natural world.</td>
<td>111</td>
<td>1</td>
<td>7</td>
<td>4.80</td>
<td>1.45</td>
</tr>
<tr>
<td>12. When I think of my place on Earth, I consider myself to be a top member of a hierarchy that exists in nature.</td>
<td>111</td>
<td>1</td>
<td>7</td>
<td>4.57</td>
<td>1.63</td>
</tr>
<tr>
<td>13. I often feel like I am only a small part of the natural world around me, and that I am no more important than the grass on the ground or the birds in the trees.</td>
<td>111</td>
<td>1</td>
<td>7</td>
<td>3.93</td>
<td>1.90</td>
</tr>
<tr>
<td>14. My personal welfare is independent of the welfare of the natural world.</td>
<td>111</td>
<td>1</td>
<td>7</td>
<td>3.74</td>
<td>1.77</td>
</tr>
</tbody>
</table>

*Note: 1 = Strongly Disagree, 4 = Neutral, 7 = Strongly Agree.*

Table 1 shows the descriptive statistics for the Connectedness to Nature Scale items. The scale responses ranged from 1 (strongly disagree) to 7 (strongly agree) on 14 items relating to participants’ connectedness to nature. Before the means were computed, items 4, 12, and 14 were reverse-coded. Means ranged from 2.72 (item 4) to 5.95 (item 3) and the participants’ responses were highest on item 3 (I recognize and appreciate the
intelligence of other living organisms) with a mean of 5.95 (SD = 1.06), indicating that participants rated this time high. Item 4 (I often feel disconnected from nature) had the lowest mean of 2.27 (SD = 1.48), indicating that participants tended to disagree with this statement. Based on the data, it appears that most of the participants were either neutral or agreed with the majority of the items, with the exception of item 4, which respondents tended to disagree with. Here there was an exception (item 3) which the participants appeared to agree with more strongly. These results indicated that students from this sample had a neutral connection to the natural world.

Table 2

Descriptive Statistics for the Time Spent Outdoors Scale

<table>
<thead>
<tr>
<th>Time spent at:</th>
<th>N</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Ocean/beach</td>
<td>111</td>
<td>1</td>
<td>6</td>
<td>3.66</td>
<td>1.18</td>
</tr>
<tr>
<td>2. River/stream/lake/pond</td>
<td>111</td>
<td>1</td>
<td>6</td>
<td>3.05</td>
<td>1.13</td>
</tr>
<tr>
<td>3. Mountain/hill</td>
<td>111</td>
<td>1</td>
<td>6</td>
<td>3.69</td>
<td>1.40</td>
</tr>
<tr>
<td>4. Forest</td>
<td>111</td>
<td>1</td>
<td>6</td>
<td>2.42</td>
<td>1.23</td>
</tr>
<tr>
<td>5. Grassland/prairie</td>
<td>111</td>
<td>1</td>
<td>6</td>
<td>2.23</td>
<td>1.21</td>
</tr>
<tr>
<td>6. Recreational park</td>
<td>111</td>
<td>1</td>
<td>6</td>
<td>4.05</td>
<td>1.38</td>
</tr>
<tr>
<td>7. Desert</td>
<td>111</td>
<td>1</td>
<td>6</td>
<td>2.63</td>
<td>1.41</td>
</tr>
</tbody>
</table>

Note: 1 = Never, 2 = Very Rarely, 3 = Rarely, 4 = Occasionally, 5 = Frequently, 6 = Very Frequently.

Table 2 shows the descriptive statistics for the Time Spent Outdoors Scale items. The responses ranged from 1 (never) to 6 (very frequently), indicating how much time the participants spent outdoors in various types of terrain. The means ranged from 2.23 (SD = 1.21) to 4.05 (SD = 1.38). Results indicate that most students spent the least amount of time in grasslands/prairies and the most amount of time in recreational parks. The second most visited terrain was a mountain/hill with a mean of 3.69 (SD = 1.40) followed by the ocean/beach with a mean of 3.66 (SD = 1.18). It is not surprising that the student participants spent the most time in recreational parks since such natural spaces are most
accessible to this population given the location (i.e., Southern California). It is interesting to note that the means indicated that students as a whole, on average, did not spend time either “frequently” or “very frequently” in any type of natural environment.

Table 3

Descriptive Statistics for the Stress Symptoms Scale

<table>
<thead>
<tr>
<th>Symptom</th>
<th>N</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Memory problems</td>
<td>111</td>
<td>1</td>
<td>6</td>
<td>3.48</td>
<td>1.45</td>
</tr>
<tr>
<td>2. Difficulty concentrating</td>
<td>111</td>
<td>1</td>
<td>6</td>
<td>3.74</td>
<td>1.19</td>
</tr>
<tr>
<td>3. Anxious thoughts</td>
<td>111</td>
<td>1</td>
<td>6</td>
<td>3.95</td>
<td>1.27</td>
</tr>
<tr>
<td>4. Negative outlook on future</td>
<td>111</td>
<td>1</td>
<td>6</td>
<td>3.15</td>
<td>1.34</td>
</tr>
<tr>
<td>5. Constant worrying</td>
<td>111</td>
<td>1</td>
<td>6</td>
<td>3.69</td>
<td>1.35</td>
</tr>
<tr>
<td>6. Irritability</td>
<td>111</td>
<td>1</td>
<td>6</td>
<td>3.36</td>
<td>1.24</td>
</tr>
<tr>
<td>7. Fluctuations in mood</td>
<td>110</td>
<td>1</td>
<td>6</td>
<td>3.39</td>
<td>1.22</td>
</tr>
<tr>
<td>8. Inability to relax</td>
<td>110</td>
<td>1</td>
<td>6</td>
<td>3.47</td>
<td>1.38</td>
</tr>
<tr>
<td>9. Feelings of unhappiness</td>
<td>111</td>
<td>1</td>
<td>6</td>
<td>3.17</td>
<td>1.23</td>
</tr>
<tr>
<td>10. Feeling overwhelmed</td>
<td>110</td>
<td>1</td>
<td>6</td>
<td>3.96</td>
<td>1.35</td>
</tr>
<tr>
<td>11. Aches and pains in body</td>
<td>111</td>
<td>1</td>
<td>6</td>
<td>3.56</td>
<td>1.33</td>
</tr>
<tr>
<td>12. Upset stomach</td>
<td>111</td>
<td>1</td>
<td>6</td>
<td>3.01</td>
<td>1.35</td>
</tr>
<tr>
<td>13. Rapid heartbeat</td>
<td>111</td>
<td>1</td>
<td>6</td>
<td>2.65</td>
<td>1.18</td>
</tr>
<tr>
<td>14. Frequent colds</td>
<td>111</td>
<td>1</td>
<td>6</td>
<td>2.55</td>
<td>1.28</td>
</tr>
<tr>
<td>15. Loss of interest in sex</td>
<td>110</td>
<td>1</td>
<td>6</td>
<td>2.52</td>
<td>1.46</td>
</tr>
<tr>
<td>16. Changes in appetite (eating more or less)</td>
<td>111</td>
<td>1</td>
<td>6</td>
<td>3.22</td>
<td>1.32</td>
</tr>
<tr>
<td>17. Changes in sleeping patterns (sleeping too much or too little)</td>
<td>111</td>
<td>1</td>
<td>6</td>
<td>3.68</td>
<td>1.45</td>
</tr>
<tr>
<td>18. Avoiding responsibilities</td>
<td>111</td>
<td>1</td>
<td>6</td>
<td>2.58</td>
<td>1.25</td>
</tr>
<tr>
<td>19. Alcohol, cigarettes, or drug use</td>
<td>111</td>
<td>1</td>
<td>6</td>
<td>2.40</td>
<td>1.53</td>
</tr>
<tr>
<td>20. Isolating yourself from peers/family/friends</td>
<td>111</td>
<td>1</td>
<td>6</td>
<td>2.74</td>
<td>1.39</td>
</tr>
</tbody>
</table>

*Note: 1 = Never, 2 = Very Rarely, 3 = Rarely, 4 = Occasionally, 5 = Frequently, 6 = Very Frequently.*

Table 3 shows the descriptive statistics for the items on the Stress Symptoms Scale items. Responses ranged from 1 (never) to 6 (very frequently), indicating how frequently the participants experienced stress symptoms. The means ranged from 2.40 (SD = 1.53) to 3.96 (SD = 1.35). It appears that students experienced the stress symptom of alcohol, cigarettes, or drug use (item 19) the least, and the stress symptoms of feeling
overwhelmed (item 10) the most. This was closely followed by anxious thoughts (item 3) with a mean of 3.95 (SD = 1.27) and difficulty concentrating (item 2) with a mean of 3.74 (SD = 1.19).

Table 4

Summary of the Descriptive Statistics of the Scales

<table>
<thead>
<tr>
<th>Scale</th>
<th>N</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nature Scale</td>
<td>111</td>
<td>2.71</td>
<td>6.36</td>
<td>4.87</td>
<td>.83</td>
</tr>
<tr>
<td>Outdoors Scale</td>
<td>111</td>
<td>1.29</td>
<td>4.86</td>
<td>3.11</td>
<td>.79</td>
</tr>
<tr>
<td>Stress Scale</td>
<td>111</td>
<td>1.35</td>
<td>5.65</td>
<td>3.22</td>
<td>.81</td>
</tr>
</tbody>
</table>

Table 4 shows the descriptive statistics for the three scales used in this study. The Connectedness to Nature Scale had a mean of 4.87 (SD = .83) indicating that the participants tended to respond from neutral to slightly agree on the 14 items on the scale. The Time Spent Outdoors Scale had a mean of 3.11 (SD = .79) indicating that the participants did not seem to spend much time outdoors. Furthermore, the Stress Symptoms Scale had a mean of 3.22 (SD = .81) indicating that the participants did not seem to experience stress symptoms frequently. Finally, each of the three scales were approximately normally distributed in the sample (see Figures 1-3).
Table 5

*Reliability Estimates for the Natural Environment and Mental Health Scales*

<table>
<thead>
<tr>
<th>Scale</th>
<th>Number of items</th>
<th>Cronbach’s alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nature</td>
<td>14</td>
<td>.81</td>
</tr>
<tr>
<td>Outdoors</td>
<td>7</td>
<td>.73</td>
</tr>
<tr>
<td>Stress</td>
<td>20</td>
<td>.91</td>
</tr>
</tbody>
</table>

Table 5 displays the Cronbach’s alphas for the scales used in this study. For the Connectedness to Nature Scale, alpha was found to be .81, which indicates that 81% of the variation in scores was due to true differences in respondents’ Connectedness to Nature, and thus 19% of the variation in scores was due to measurement error. For the Time Spent Outdoors Scale, alpha was found to be .73, which indicates that 73% of the variation in scores was due to true differences in Time Spent Outdoors, with 27% of the variation due to measurement error. For the Stress Symptoms Scale, alpha was found to be .91 which indicates that 91% of the variation was due to true differences in respondents’ Stress Symptoms, and 9% was due to measurement error.

Estimates of internal-consistency reliability can be obtained based on the observed correlations among all the different items on a given scale. It measures whether several items that propose to measure the same general construct produce similar scores. If one tries to put a number to a construct, it is not a perfect measurement. One cannot say exactly what the measurement will be, but an estimate can be given. For this study, internal-consistency reliability was measured using Cronbach’s alpha (α). An accepted rule of thumb for interpreting such estimates of internal consistency is as follows: $\alpha \geq .9$ is excellent, $.9 > \alpha \geq .8$ is good, $.8 > \alpha \geq .7$ is acceptable, $.7 > \alpha \geq .6$ is questionable,
.6 > α ≥ .5 is poor, and .5 > α is unacceptable. Based on this rule of thumb, the internal consistency of the Connectedness to Nature Scale was considered to be quite good (.81); the internal consistency of the Time Spent Outdoors Scale was acceptable (.73); and, the internal consistency of the Stress Symptoms Scale was deemed excellent (.91).

Table 6

*Pearson Product-Moment Correlations among the Scales*

<table>
<thead>
<tr>
<th></th>
<th>Nature</th>
<th>Outdoors</th>
<th>Stress</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outdoors</td>
<td></td>
<td>.40*</td>
<td></td>
</tr>
<tr>
<td>Stress</td>
<td>-.18</td>
<td>-.21*</td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>.18</td>
<td>.12</td>
<td>-.09</td>
</tr>
</tbody>
</table>

*Note. N = 111, * p < .05

Table 6 illustrates the correlations among the scales. However, these scales are assumed to have measurement error, which in turn can attenuate the observed correlations (i.e., making them lower). In order to adjust for the bias in the correlations, one can use Spearman’s Correction for Attenuation formula to adjust scores (and correlations) for measurement error. Correlations resulting after the application of Spearman’s correction formula are referred to as disattenuated correlations. Such correlations can be interpreted as being free of measurement error. Table 7 displays the disattenuated correlations among the scales used in this study.
Table 7

Disattenuated Correlations among Natural Environment and Mental Health Scales

<table>
<thead>
<tr>
<th></th>
<th>Nature</th>
<th>Outdoors</th>
<th>Stress</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outdoors</td>
<td>.52*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stress</td>
<td>-.24</td>
<td>-.26*</td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>.20</td>
<td>.14</td>
<td>-.09</td>
</tr>
</tbody>
</table>

Note. N = 111, * p < .05

The disattenuated correlation between Time Spent Outdoors and Connectedness to Nature was .52, which resulted in an \( r^2 = .27 \). This indicates that 27% of the variation in the Connectedness to Nature Scale was explained by the Time Spent Outdoors Scale. By social science standards, this is a large effect size, thus, there was a positive association between Time Spent Outdoors and Connectedness to Nature. The disattenuated correlation between Time Spent Outdoors and Stress Symptoms was -.26, which resulted in an \( r^2 = .07 \) which indicates that 7% of the variation of Stress Symptoms was explained by Time Spent Outdoors. This results in a somewhat small effect size. There was a negative association between Time Spent Outdoors and Stress Symptoms, which indicates that the more time a student spends outdoors, the lower his or her stress. It should be noted that the relationship between Connectedness to Nature and Stress Symptoms was negative, however, because the result was not statistically significant at the .05 level, the effect size for this result should be interpreted with caution. The other disattenuated correlations in Table 7 were not significant at the .05 level, which suggests that the relationships among these scales were not significantly different from zero.
Figure 1. Distribution of scores for the Connectedness to Nature Scale.
Figure 2. Distribution of scores for the Time Spent Outdoors Scale.
Figure 3. Distribution of scores for the Stress Symptoms Scale.
Synthesis of the Research

The major findings of this study illustrate that the overarching hypotheses (that the greater a student’s connectedness to nature and the more time the student spends outdoors, the lower his or her frequency of stress symptoms will be) were upheld. However, one hypothesis was not upheld, because the result was not statistically significant at the .05 level. More specifically, there was a strong and positive relationship between Time Spent Outdoors and Connectedness to Nature. Hence, the hypothesis that the greater a student’s connectedness to nature, the more time the student spends outdoors, was tenable. Additionally, there was a negative relationship observed between Time Spent Outdoors and Stress Symptoms, which indicates that the more time a student spends outdoors, the lower his or her stress. Thus, the hypothesis that the more time a student spends outdoors, the lower his or her frequency of stress symptoms was upheld.

Finally, the relationship between Connectedness to Nature and Stress Symptoms was negative, which was consistent with one of the hypotheses of the study, however, because the result was not statistically significant at the .05 level, the result is interpreted with caution. Yet the overall results indicated that the higher the connectedness to nature, the lower the stress symptoms. Lastly, the age of the participant was found to be mostly unrelated to the three constructs estimated in this study (Connectedness to Nature, Time Spent Outdoors, and Stress Symptoms). Overall, what can be drawn from the results of this study is that connectedness to nature does affect how much time a student spends outdoors, and that connectedness to nature also has an influence on the frequency of stress symptoms that a student may experience. Also, the amount of time a student spends outdoors seems to reduce the frequency of stress symptoms of the student.
CHAPTER 5 CONCLUSION

The purpose of this research was to illustrate how human beings are interdependent upon the Earth which nurtured them into existence, and how trying to heal mental distress without taking the natural environment into consideration is self-destructive since human beings are an essential part of the web of nature (Brown, 1995).

According to psychotherapist Nick Totton (2011):

Therapy has so far tended to focus obsessively . . . on human beings and their relationships with each other, to the exclusion of the rest of the universe. Many people —including many practitioners— would in fact assume that the entire subject matter of therapy is human relationship and our feelings about it. But we don’t just have feelings about human beings. We have actual . . . relationships with animals, plants, trees, hills, rocks, rivers, winds, dreams, . . . spirits, and many other aspects of reality— and if we don’t have such relationships, their absence will have a profound bearing on our states of difficulty and distress. (p. 190)

In order to heal such difficulty and distress, nature can be used as a therapeutic partner in the process and it can be successfully integrated into treatment with any client who seeks to be nurtured and grow (Berger, 2008). Nature does not judge, thus, clients feel safe to be true to their feelings. Further, nature is a live organism that is neither controlled nor owned by the client or therapist; it is a space that has always existed and always will, even after the client and therapist depart from it (Berger, 2003). Such a notion in itself may have a soothing effect on a highly stressed client.

Due to increasing urbanization, the modern individual’s home has become further and further removed from natural environments (van den Berg, Mass, Verheij, & Groenewegen, 2010). According to Buzzell (2009), this completely unnatural and unceasingly stressful lifestyle that the modern individual is saturated in is usually treated by prescription drugs and traditional psychotherapy. However, Ecotherapists are taking a
different approach by asking more basic questions which include: What living conditions are normal and healthy for us? How can we make the transition from unhealthy living patterns to more natural lifestyles, given the culture we live in now? (Buzzell, 2009).

What mental health practitioners must consider is that the client may not expect the issues of the natural environment as important to him or her, thus, the client may act as though his or her personal distress is entirely split from the crisis taking place “out there” (Rust, 2009, p. 40). In this light, mental health practitioners must expand the definition of what a client’s space in life is defined as and help clients expand this to include the natural environment (Norton, 2009). According to the APA’s 2010 Stress in America survey, the number-one cause of stress in Americans’ lives is money (Clay, 2011). When people are stressed and they wish to seek to speak with a mental health professional, their finances may be holding them back from seeking therapy. Students are especially on rigid budgets, which may steer them away from therapy altogether. However, a person does not need to see a mental health professional in order to ease his or her stress. One can simply spend time outdoors and allow one’s connection to nature to ease the mind and heal the spirit. Unlike prescription medications, Ecotherapy is free, has no negative side effects, and is available to almost anyone. Given the research evidence, Ecotherapy is a credible, clinically-valid treatment option and needs to be prescribed by mental health practitioners especially when for many people access to treatments other than antidepressants is limited (Mind, 2007).

Ecotherapy is an important part of the future of mental healthcare and the present study further supports this notion given the results of this study. Drawing upon the history of psychology and the present-day environmental crisis as described in Chapter
One, and given the empirical studies detailed in Chapter Two, the current study hypothesized that the greater a student’s connectedness to nature and the more time the student spent outdoors, the lower his or her frequency of stress symptoms would be. Chapter Three explained the research design of this study, illustrating the population, instruments used, and procedures involved in the study. Chapter Four demonstrated major findings, which illustrated the overarching hypotheses.

**Discussion**

The overarching hypotheses (i.e., that the greater a student’s connectedness to nature and the more time the student spends outdoors, the lower his or her frequency of stress symptoms will be) was upheld, however, one hypothesis was not upheld because it was not statistically significant. More specifically, there was a positive association between Time Spent Outdoors and Connectedness to Nature. Thus, the hypothesis that the greater a student’s connectedness to nature, the more time the student spends outdoors was upheld. Additionally, there was a negative association between Time Spent Outdoors and Stress Symptoms, which indicated that the more time a student spends outdoors, the lower his or her stress. Thus, the hypothesis that the more time a student spends outdoors, the lower his or her frequency of stress symptoms was upheld. Finally, the relationship between Connectedness to Nature and Stress Symptoms was negative, which was consistent with one of the hypotheses of the study, however, the result was not statistically significant. Regardless, the results did indicate that the higher the student’s connectedness to nature, the lower his or her stress symptoms. Overall, what could be drawn from the data is that Connectedness to Nature does affect how much time a student spends outdoors, and Connectedness to Nature also has an effect on the frequency of
stress symptoms that a student experiences. Further, the amount of time a student spends outdoors reduces the frequency of stress symptoms of the student. It is important to note that these findings cannot be generalized to populations other than the one sampled in this study since the representation of the participants is crucial to the external validity of the study. Had the study used a larger sample population, including a greater variety of students (i.e., students from classes other than psychology-based classes), the results could be generalized further, but as they stand, they are limited.

**Future Research and Implications for Marriage and Family Therapists**

In light of the results presented in this study, there are important areas of research that should be pursued. In addition to extending the study to other populations such as young children and the elderly, it would be interesting to explore what role airborne aromatic chemicals found in nature play on students’ stress levels. Such findings would have important implications for mental health practitioners and college campus planners alike. Other important implications for mental health practitioners would be to study the relationship between people’s connection to nature and empathy and how immersion in nature can bolster resilience. Further research should explore this new important area of psychology by investigating how traditional therapies compare to Ecotherapy in how they are effective in healing clients’ mental distress. Perhaps investigating economic data would estimate the financial implications and savings for the healthcare industry from nature-centered therapy which would lead to a greater acceptance of Ecotherapy as a valid form of treatment.

The goal of Ecotherapy treatment is to assist in healing mental distress and create well-being for the client. Based on the findings of this study and based on previous
research, mental health practitioners are encouraged to become acquainted with Ecotherapeutic methods in treating their clients. Since psychotherapy often revolves around a client’s relationship to his or her home, the field must now expand the definition of home to include the world at large since Earth is our shared home and it unites us. More specifically, the environment organizes an individual’s neurological patterns and processes, and changes in the environmental world create changes in the consciousness of the people who live in it (Santostefano, 2008). Previous research findings and the present study’s results indicate that nearly all people are able to benefit from some type of nature-centered therapy. It is possible to invite clients to carry out the classic client hour in nearby nature such as a park or garden. The issues which must be addressed, however, are the limits of confidentiality, the safety of the client, and unpredictable weather conditions. It is also important to consider the limitations of such work with very young children, the elderly, and people with physical disabilities who may have a difficult time in such an open environment. Regardless, nature may expand the therapeutic process and open additional dimensions which may not be reached by working with a client in an enclosed room (Berger, 2008). According to Selhub and Logan (2012), counseling sessions in natural environments reduce stress, enhance cognitive function, and lessen attentional fatigue which strengthens what a skilled therapist has to offer. Simpler ways of incorporating Ecotherapy into practice are to include plants and water fountains and to display art that depicts nature scenes in one’s office or waiting room which allows clients to have a form of contact with nature.

Contact with nature has generally been categorized by viewing nature, being in the presence of nearby nature, and actively participating and being involved with nature.
In order to employ nature-centered therapy, mental health practitioners may consider the following guidelines: (a) safety first—identify potential hazards and dress appropriately for the weather and terrain; (b) receive appropriate training—take courses or workshops which are offered by seasoned Ecotherapists; (c) learn about nature—become familiar with the basics of ecology; (d) leave home—spend time outside in a nearby nature area on a continued basis; (e) work in a variety of natural areas—remember that people learn different lessons from forests, meadows, rivers, waterfalls, mountains, rocks, and oceans; (f) and, let nature do the therapy—allow clients to make their own discoveries and help relate those discoveries to their lives (Scull, 2009). By honoring Earth as a healing partner, mental health practitioners are able to positively change their own lives and the lives of their clients. In this light, they are also able to help heal the environmental devastation which is wounding Earth. Harvard-trained clinical psychologist and one of the founders of the Ecopsychology movement, Sarah Conn (1995) further illustrates the importance of this type of therapy:

When people are unable to grieve personal losses openly and with others, they numb themselves, even constricting their muscles in order not to let the grief show. This can become chronic, leading them to see, hear, feel, and breathe less. The same process of numbing and constriction occurs with our loss of connection to a sense of place in a viable, thriving ecosystem. Many of us have learned to walk, breathe, look, and listen less, to numb our senses to both the pain and the beauty of the natural world, living so-called personal lives, suffering in what we feel are “merely personal” ways, keeping our grief even from ourselves. Feeling empty, we then project our feelings onto others, or engage in compulsive, unsatisfactory activities that neither nourish us nor contribute to the healing of the larger context. Perhaps the currently high incidence of depression is in part a signal of our bleeding at the roots, being cut off from the natural world, no longer as able to cry at its pain or to thrill at its beauty. The challenge of an ecologically responsible psychotherapy is to develop ways to work with the “purely personal” problems brought by clients so that they can be seen not only as unique expressions but also as microcosms of the larger whole, of what is happening in the world. The goals of therapy then include not only the ability to find joy in the world, but also to hear the Earth speaking in one’s own suffering, to participate in
and contribute to the healing of the planet by finding one’s niche in the Earth’s living system and occupying it actively. (p. 171)

In addition to incorporating Ecotherapeutic methods into practice with clients, mental health graduate programs in marriage and family therapy, social work, psychology, and psychiatry are encouraged to include Ecopsychology courses in their curriculum. Such courses would not only benefit mental health practitioners in their work with clients in diverse clinical settings, but these classes have the potential of helping mental health practitioners cope with their own life stressors.

As mental health practitioners, we are called to help people heal the wounds they have acquired throughout their lives. One of the most profound manners in which we are able to help our clients mend and see beauty in the world is by showing them how to truly experience and appreciate our life on Earth. In addition to stepping out into nature, we can experience the Earth within us since we are nature; we were born out of the Earth, not into it. If we allow ourselves to slow down and pause to hear our breath, we hear the waves of the ocean. If we give ourselves the moment to appreciate the rivers of blood coursing throughout our bodies, exiting and entering the four chambers of our hearts, we feel vitality within us. If we stop to feel our flesh, our smooth skin, we remember the smoothness of the sands we played in as children. If we allow ourselves to feel gratitude that we exist at all, if we let ourselves cultivate and grow, and if we plant our seeds on this Earth, we can find meaning and peace.
REFERENCES


University research indicates flowers and plants promote innovation, ideas. (2007). *Souvenirs, Gifts, and Novelties*, 278.


Appendix A

Invitation Email to Professors for Participation in the Study

Dear [insert professor name],

My name is Maja Szachniewicz and I am a graduate student from CSUN’s Department of Educational Psychology and Counseling. I am currently a trainee in the Marriage and Family Therapy program and I am working on my masters thesis titled “Mother Nurture: Healing Stress through Nature.” Particularly interested in Ecotherapy, a form of psychotherapy that recognizes the role of nature in healing mental distress, I am interested in investigating the relationship between the amount of time a student spends outdoors and in what type of terrain, the student’s connectedness to nature, and the student’s frequency of stress symptoms. Based on previous literature, the present study hypothesizes that the greater a student’s connectedness to nature and the more time the student spends outdoors, the fewer stress symptoms the student will have. I am currently trying to recruit students who are interested in participating in the study, thus, I am kindly asking if it is possible to come into your classroom and take 25 minutes of your time to pass out a brief questionnaire to students who are interested in participating in the study. If you are willing to have your students participate, I kindly ask that you let me know what date and time work for you, and I would be absolutely grateful for your students participating in my research project.

I thank you for your time and look forward to hearing from you.

Every best wish, Maja Szachniewicz

Marriage and Family Therapy Trainee, California State University Northridge
Appendix B

Data Collection Materials

1. Participant Information
   Age: __________
   Sex: __________
   Student Status: (undergraduate or graduate) ________________

2. Connectedness to Nature Scale
   Please answer each of these questions in terms of the way you generally feel. There are no right or wrong answers. Using the following scale, in the space provided next to each question simply state as honestly and candidly as you can what you generally experience.

   1  2  3  4  5  6  7
   Strongly Disagree Neutral Strongly Agree

   ___ 1. I often feel a sense of oneness with the natural world around me.
   ___ 2. I think of the natural world as a community to which I belong.
   ___ 3. I recognize and appreciate the intelligence of other living organisms.
   ___ 4. I often feel disconnected from nature.
   ___ 5. When I think of my life, I imagine myself to be part of a larger cyclical process of living.
   ___ 6. I often feel a kinship with animals and plants.
   ___ 7. I feel as though I belong to the Earth as equally as it belongs to me.
   ___ 8. I have a deep understanding of how my actions affect the natural world.
   ___ 9. I often feel part of the web of life.
   ___ 10. I feel that all inhabitants of Earth, human and non-human, share a common “life force.”
   ___ 11. Like a tree can be part of a forest, I feel embedded within the broader natural world.
   ___ 12. When I think of my place on Earth, I consider myself to be a top member of a hierarchy that exists in nature.
   ___ 13. I often feel like I am only a small part of the natural world around me, and that I am no more important than the grass on the ground or the birds in the trees.
   ___ 14. My personal welfare is independent of the welfare of the natural world.

*Permission to use Connectedness to Nature Scale granted
### 3. Time Spent Outdoors
Using the following scale, in the space provided next to each type of terrain, please state how often you spend time in each environment.

<table>
<thead>
<tr>
<th></th>
<th>6</th>
<th>5</th>
<th>4</th>
<th>3</th>
<th>2</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Very Frequently</td>
<td>Occasionally</td>
<td>Rarely</td>
<td>Very</td>
<td>Never</td>
<td>Rarely</td>
</tr>
</tbody>
</table>

_____ 1. Ocean/beach
_____ 2. River/stream/lake/pond
_____ 3. Mountain/hill
_____ 4. Forest
_____ 5. Grassland/prairie
_____ 6. Recreational park
_____ 7. Desert
_____ 8. Other (please specify): _________________________

### 4. Stress Symptoms
Using the following scale, in the space provided next to each type of stress symptom, please state how often you experience the symptom.

<table>
<thead>
<tr>
<th></th>
<th>6</th>
<th>5</th>
<th>4</th>
<th>3</th>
<th>2</th>
<th>1</th>
</tr>
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<td>Occasionally</td>
<td>Rarely</td>
<td>Very</td>
<td>Never</td>
<td>Rarely</td>
</tr>
</tbody>
</table>

_____ 1. Memory problems
_____ 2. Difficulty concentrating
_____ 3. Anxious thoughts
_____ 4. Negative outlook on future
_____ 5. Constant worrying
_____ 6. Irritability
_____ 7. Fluctuations in mood
_____ 8. Inability to relax
_____ 9. Feelings of unhappiness
_____ 10. Feeling overwhelmed
_____ 11. Aches and pains in body
_____ 12. Upset stomach
_____ 13. Rapid heartbeat
_____ 14. Frequent colds
_____ 15. Loss of interest in sex
_____ 16. Changes in appetite (eating more or less)
_____ 17. Changes in sleeping patterns (sleeping too much or too little)
_____ 18. Avoiding responsibilities
_____ 19. Alcohol, cigarettes, or drug use
_____ 20. Isolating yourself from peers/family/friends
Appendix C

Adult Consent Form

California State University, Northridge
CONSENT TO ACT AS A HUMAN RESEARCH SUBJECT

Mother Nurture: Healing Stress through Nature

You are being asked to participate in a research study. Participation in this study is completely voluntary. Please read the information below and ask questions about anything that you do not understand before deciding if you want to participate. A researcher listed below will be available to answer your questions.

RESEARCH TEAM

Researcher:
Maja Szachniewicz, Marriage and Family Therapy Trainee
Educational Psychology and Counseling
(818) 677 – 6860 Ext. 9463

Faculty Advisor:
Dr. Michael Laurent, Ph.D.
Associate Professor and Director of Mitchell Family Counseling Clinic
Educational Psychology and Counseling
18111 Nordhoff St., Northridge, CA 91330- Department Mail Code 8265
(818) 677 – 2541

PURPOSE OF STUDY
The purpose of this research study is to investigate one’s connectedness to nature and the relationship between the time one spends outdoors and one’s frequency of stress symptoms.

SUBJECTS

Inclusion Requirements
You are eligible to participate in this study if you at least 18 years of age or older, and are a CSUN undergraduate or graduate student.

Time Commitment
This study will involve approximately 25 minutes of your time.

PROCEDURES
The following procedures will occur: You will sign the Adult Consent Form and the Bill of Rights. After these forms are collected, you will take approximately 10 minutes to fill out a questionnaire/survey.

RISKS AND DISCOMFORTS
This study involves no more than minimal risk. There are no known harms or discomforts associated with this study beyond those encountered in normal daily life.
BENEFITS

Subject Benefits
The possible benefits you may experience from the procedures described in this study include your awareness of your connectedness to nature, the time you spend outdoors, and your stress symptoms.

Benefits to Others or Society
The benefits of this study include a greater awareness of the healing benefits of nature which include, but are not limited to, decreased levels in stress symptoms.

ALTERNATIVES TO PARTICIPATION
The only alternative to participation in this study is not to participate.

COMPENSATION, COSTS AND REIMBURSEMENT

Compensation for Participation
If you are eligible, you may receive credit for an eligible course at the rate of 1 point per 15 minutes of participation. For this specific study, you will receive 2 points if you are eligible for course credit.

WITHDRAWAL OR TERMINATION FROM THE STUDY AND CONSEQUENCES
You are free to withdraw from this study at any time. There are no consequences for withdrawing.

CONFIDENTIALITY

Subject Identifiable Data
All identifiable information (your name and signature) will not be linked to the research. The questionnaire/survey is anonymous and only includes your age, sex, and student status.

Data Storage
All research data will be stored on a laptop computer that is password protected.

Data Access
The researcher and faculty advisor named on the first page of this form will have access to your study records. Any information derived from this research project that personally identifies you will not be voluntarily released or disclosed without your separate consent, except as specifically required by law. Publications and/or presentations that result from this study will not include identifiable information about you.

Data Retention
The researcher intends to keep the research data until analysis of the information is completed, and the master thesis is completed, and then the research data will be destroyed.

IF YOU HAVE QUESTIONS
If you have any comments, concerns, or questions regarding the conduct of this research please contact the research team listed on the first page of this form.

If you are unable to reach a member of the research team listed on the first page of the form and have general questions, or you have concerns or complaints about the research study, research team, or questions about your rights as a research subject, please contact Research and Sponsored Projects, 18111 Nordhoff Street, California State University, Northridge, Northridge, CA 91330-8232, or phone 818-677-2901.
VOLUNTARY PARTICIPATION STATEMENT
You should not sign this form unless you have read it and been given a copy of it to keep. 
**Participation in this study is voluntary.** You may refuse to answer any question or discontinue your involvement at any time without penalty or loss of benefits to which you might otherwise be entitled. Your decision will not affect your future relationship with California State University, Northridge. Your signature below indicates that you have read the information in this consent form and have had a chance to ask any questions that you have about the study.

_I agree to participate in the study._

___________________________________________________  ___________________
Subject Signature                        Date

___________________________________________________
Printed Name of Subject

___________________________________________________  ___________________
Researcher Signature                      Date

___________________________________________________
Printed Name of Researcher
Appendix D

Participant Bill of Rights

CALIFORNIA STATE UNIVERSITY, NORTHRIDGE
EXPERIMENTAL SUBJECTS
BILL OF RIGHTS

The rights below are the rights of every person who is asked to be in a research study. As an experimental subject I have the following rights:

1) To be told what the study is trying to find out,

2) To be told what will happen to me and whether any of the procedures, drugs, or devices is different from what would be used in standard practice,

3) To be told about the frequent and/or important risks, side effects or discomforts of the things that will happen to me for research purposes,

4) To be told if I can expect any benefit from participating, and, if so, what the benefit might be,

5) To be told the other choices I have and how they may be better or worse than being in the study,

6) To be allowed to ask any questions concerning the study both before agreeing to be involved and during the course of the study,

7) To be told what sort of medical treatment (if needed) is available if any complications arise,

8) To refuse to participate at all or to change my mind about participation after the study is started. This decision will not affect my right to receive the care I would receive if I were not in the study.

9) To receive a copy of the signed and dated consent form.

10) To be free of pressure when considering whether I wish to agree to be in the study.

If I have other questions I should ask the researcher or the research assistant, or contact Research and Sponsored Projects, California State University, Northridge, 18111 Nordhoff Street, Northridge, CA 91330-8232, or phone (818) 677-2901.

X
Signature of Subject

Date
Appendix E

Procedure Script

Once the researcher receives permission to come into an undergraduate or graduate class to conduct the study, the following procedure will take place:

A. Researcher walks into the classroom and greets the professor and students. This will take approximately 5 minutes.
   “Hello everyone. My name is Maja Szachniewicz and I am a Marriage and Family Therapy graduate student here at CSUN. I am currently working on my master’s thesis which will investigate people’s relationship to nature, that is, the natural world. Your professor has given me permission to use 15-25 minutes of your time to ask you to fill out a questionnaire. The only requirement to participate in this study is that you are at least 18 years of age. I really appreciate your time and thank you for your participation, if you choose to participate. Your participation may count as course/research credit, if this is applicable to you. If you do not wish to participate in the experiment, please do not take the handouts/papers I will be passing out. Instead, I ask that you please remain in your seat quietly as the others fill out the questionnaire. Are there any questions?”

B. Researcher passes out the Adult Consent Form and the Participant Bill of Rights. This will take approximately 5 minutes.
   “I will now pass out the Adult Consent Form and the Participant Bill of Rights. Please read both forms and sign your name and date the forms. Once you are done reading the forms and signing your names, please pass the forms to the front of your row and I will collect the forms. Are there any questions?”

C. After the researcher collects the Adult Consent Forms and the Participant Bill of Rights forms, the researcher will hand out the questionnaire, the data instrument, to the participants, and wait for the participants to complete the questionnaire. This will take approximately 10 minutes.
   “I will now pass out the questionnaire. Please do not put your name on this handout. There are no right or wrong answers, and so I ask that you please answer as honestly as you can. After you have completed the questionnaire, please turn it over on your desk. Once everyone has completed the questionnaire, I will come by and collect it.”

D. Once the participants have completed the questionnaire, the researcher will debrief the study. This will take approximately 5 minutes.
   “Thank you to those who have participated in this study. I appreciate and value your time. The objective of this study is to see if there is a connection between the amount of time students spend outdoors and in what type of terrain, their connectedness to nature, and their frequency of stress symptoms. Based on previous findings, the present study hypothesizes that the greater a student’s connectedness to nature and the more time the student spends outdoors, the less stress symptoms he or she will experience. The reason this is important is because there has been a growing disconnection from the natural world, and this may produce a variety of psychological symptoms that include anxiety, frustration, and depression, and studies show that the environment significantly impacts personal and social well-being (Chalquist, 2009). I encourage anyone who is feeling stressed to take some time to immerse yourself in an outdoor activity and see if this time benefits you. If you have any questions, please ask now, or you may contact me or my faculty advisor privately. Our contact information is on the first page of the Adult Consent Form. Thank you again for time. Have a wonderful day (or evening), everyone!”