# LOYOLA UNIVERSITY MARYLAND

— 1852 —

The dissertation of
**Heidi Schreiber-Pan**
entitled

**Well-being with Nature in Mind:**
**Connectedness to Nature and the Role of Spirituality in Predicting Well-Being and Resilience**

submitted to the Department of Pastoral Counseling in partial fulfillment of the requirements for the Degree of Doctor of Philosophy in the Loyola College of Arts and Sciences has been read and approved by the Committee:

L. Mickey Fenzel, Ph.D.
Committee Chair

Gina M. Magyar-Russell, Ph.D.
Associate Chair

Kari A. O'Grady, Ph.D.
Reader I

Deborah Haskins, Ph.D.
Reader II

L. Mickey Fenzel, Ph.D.
Department Chair

James J. Buckley, Ph.D.
Dean, Loyola College of Arts & Sciences

7 January 2015
Date

# Well-being with Nature in Mind:

# Connectedness to Nature and the Role of Spirituality

# in Predicting Well-Being and Resilience.

Heidi Schreiber-Pan

B. A. Towson University
M. S. Loyola College

Submitted to the Department of Pastoral Counseling
Loyola University Maryland
in Partial Fulfillment of the Requirements for the
Degree of Doctor of Philosophy

January, 2015

## DEDICATION

This research project is dedicated to my family and my friends. I am especially thankful to my husband, Morrison, who has above all others, supported me throughout this process. Thank you to my children, Sebastian and Payton, who have freely given me space and time to work on this project. A special feeling of gratitude to my loving parents, Kurt and Carol, and my sister, Petra, whose words of encouragement never ceased.

I also dedicate this dissertation to my friends here in the U.S. and in Germany. Their support and care have sustained me throughout the process. I will always appreciate all they have done, especially for helping me never lose sight of my connection to self, God, and Nature.

## ACKNOWLEDGEMENTS

This thesis appears in its current form due to the assistance and guidance of my committee. I would therefore like to offer my sincere thanks to all of them.

First of all, I would like to express my gratitude to my dissertation chair Dr. Leo “Mickey” Fenzel for his invaluable intellectual contributions to this project as well as continuous support and encouragement. Dr. Fenzel has shaped my intellectual development in various ways by introducing me to the intricacy of scholastic writing and research.

I am deeply indebted to Dr. Gina Maygar-Russell who has generously helped me with her mentorship, feedback and support in all phases of this dissertation. Thank you, especially for your patience and guidance with the data analysis.

Dr. Kari O’Grady, thank you for your trust, the insightful discussions, valuable advice, and especially for your belief in me throughout my entire time at Loyola.

I want to express my deep gratitude to my esteemed committee member Dr. Debbie Haskins for your support and guidance since the beginning of my graduate school journey many years ago.

I must also acknowledge Dr. Kim Shiffren, Dr. Paz Galupo and Ms. Maggie Lears for granting me access to their students at Towson University.

Lastly, I am particularly grateful to the Pastoral Counseling Department at Loyola University, Maryland. The experiences I have gained throughout this program have affected me in a highly positive manner.

## ABSTRACT

This quantitative study examined the intersection of three distinctive concepts: connection to nature, psychological well-being, and spirituality. Specifically, this study investigated if a person's connection to nature impacts his or her resilience and overall psychological well-being. This study also assessed the role of spirituality in the relationship between nature and psychological well-being. Connectedness to nature was measured using the Connectedness to Nature Scale (CNS) and the Nature Relatedness Scale (NRS). Psychological well-being was measure using the Connor-Davidson Resiliency Scale (CD-RISC) and the Scales of Psychological Well-Being (SPWB). Spirituality was measured using the Spiritual Transcendence Scale (STS) and the Sanctification Scale. The study sample included 163 undergraduate college students, ranging in age from 18 to 45 years. Analysis indicated that connectedness to nature was significantly correlated with psychological well-being but not with resilience. Similarly, connectedness to nature was positively correlated with spirituality. Hierarchical regression analyses revealed that both spirituality measures predicted well-being variables over and above connectedness to nature. Furthermore, this study's mediational analyses provided support for the role of spiritual transcendence as a partial mediator of connectedness to nature's effect on psychological well-being. Consequently, these findings confirm the mental health and spiritual value of a deep connection with nature. In addition, this study emphasized the substantial role of spirituality in the relationship between connectedness to nature and psychological well-being. Implications for clinicians and counseling educators are discussed.

# TABLE OF CONTENTS

Page

DEDICATION ........ ii

ACKNOWLEDGEMENTS ........ iii

ABSTRACT ........ iv

TABLE OF CONTENTS ........ v

LIST OF TABLES ........ viii

LIST OF FIGURES ........ x

CHAPTER I – Introduction ........ 1
- Introduction ........ 1
- Connectedness to Nature ........ 2
- Spirituality and Its Relationship with Nature ........ 4
- Construct of Spirituality ........ 5
  - Transcendence ........ 6
  - Sanctification ........ 6
- Psychological Well-being and Resilience ........ 7
- Research Aims and Questions ........ 9
- Significance of this Study ........ 10
- Limitations of the Study ........ 11

CHAPTER II – Review of the Literature ........ 12
- Nature and its Relationship with Spirituality ........ 12
- The Construct of Spirituality ........ 20
- Spirituality and Mental Health ........ 22
  - Psychological Well-being ........ 22
  - Resilience ........ 27
- Nature and Mental Health ........ 31
- Connectedness to Nature ........ 35
  - Connectedness to Nature and Psychological Well-being ........ 36
  - Connectedness to Nature and Resilience ........ 39
- Summary ........ 42
- Research Aims and Hypotheses ........ 43

CHAPTER III – Methods ........ 45
- Sample ........ 45
- Participants ........ 46
- Measures ........ 46
  - Demographics ........ 46
  - Connectedness to Nature ........ 47

Connectedness to Nature Scale ..... 47
Nature Relatedness Scale ..... 48
Spirituality ..... 49
Spiritual Transcendence Scale ..... 49
Sanctification Scale ..... 50
Sanctification of Nature Scale ..... 51
Psychological Well-being ..... 52
Scales of Psychological Well-being ..... 52
Connor-Davidson Resilience Scale ..... 54
Hypotheses ..... 55
Data Analysis ..... 56

CHAPTER IV – RESULTS ..... 58
Preliminary Analysis ..... 58
Demographics ..... 58
Descriptive Statistics ..... 59
Correlational Results ..... 60
Regression Results ..... 61
Mediation Results ..... 62

CHAPTER V – DISCUSSION ..... 65
Introduction ..... 65
Summary of Findings ..... 65
Connectedness to Nature and Well-being ..... 65
Connectedness to Nature and Spirituality ..... 67
Connectedness to Nature, Spirituality and Well-being ..... 68
Mediational Findings ..... 69
Contributions to Counseling Psychology ..... 70
Mental Health Value of Connection to Nature ..... 70
Spiritual Value of Connection to Nature ..... 71
Spirituality's Role In the Nature/Well-being Relationship ..... 72
Sanctification of Nature Scale ..... 72
Limitations of the Study ..... 73
Sampling Limitation ..... 73
Measurement Limitation ..... 74
Correlations Research Limitation ..... 76
Directions for Future Research ..... 77
Conclusion ..... 79

REFERENCES ..... 81

APPENDICES ..... 119

VITA AUCTORIS ..... 123

## LIST OF TABLES

Page

Table 1
Demographic Characteristics of Partiticpants..........................................49

Table 2
Global Religiousness Question 1-2........................................................60

Table 3
Global Religiousness Question 3 ............................................................63

Table 4
Global Religiousness Question 4 ............................................................63

Table 5
Overall Descriptive Statistics for Study Variable ...................................65

Table 6
Intercorrelation Matrix.............................................................................66

Table 7
Hierarchical Regression Analysis Predicting Resilience from
Demographic Variables, Connectedness to Nature, and Sanctification ..69

Table 8
Hierarchical Regression Analysis Predicting Resilience from Demographic
Variables, Connectedness to Nature, and Spiritual Transcendence.........71

Table 9
Hierarchical Regression Analysis Predicting Psychological Well-being from
Global Religiousness, Connectedness to Nature, and Sanctification .....72

Table 10
Hierarchical Regression Analysis Predicting Psychological Well-being from
Global Religiousness, Connectedness to Nature, and Spiritual
Transcendence..........................................................................................73

Table 11
Spiritual Transcendence as Mediator Variable between CN and
Psychological
Well-being...............................................................................................76

## LIST OF FIGURES

Page

Figure 1
Mediation Model for Spirituality as a Mediator between
Connectedness to Nature and Psychological Well-being ....................................60

Figure 2
Mediation Analysis for Spirituality as a Mediator between
Connectedness to Nature and Psychological Well-being ....................................75

# CHAPTER I

## Introduction

> Climb the mountains and get their good tidings.
>
> Nature's peace will flow into you as sunshine flows into trees.
>
> The winds will blow their own freshness into you...
>
> while cares will drop off like autumn leaves. (Muir, 1901, p. 56)

From Muir's standpoint, the value of exploring humankind's connection with the natural world is essential to the health of individuals, societies, and the planet as a whole. This dissertation examines the intersection of three distinctive concepts: connection to nature, psychological well-being, and spirituality. These three components have continuously been intertwined within the human experience. Since the earliest of days, human beings have experienced benefits from engagement with nature signifying that the connection between humankind and nature is inherent, multifaceted, meaningful, and essential.

The emerging fields of ecopsychology (Roszak, Gomes, & Kanner, 1995) and ecotherapy (Buzzell & Chalquist, 2009) highlight the scholastic attention and relevance of the connection between humans and nature. To date, however, no research has examined the links between sentiments of connectedness to the natural world and measures of psychological well-being. Specifically, this study investigates if the possibility exists that a person's connection to nature impacts his or her resilience and overall psychological well-being. Nature in this sense is defined as spaces big or small consisting predominantly of flora and fauna and having little or no human constructions (Schultz, 2002).

In addition to investigating the relationship between experiences in nature and psychological well-being, this study also explores the association between spirituality and nature. Specifically, how does a relationship with nature affect an individual's experience of spirituality? Francis of Assisi, long known as the patron saint of animals and plants, insisted that the presence of God was at hand in nature. Many people can identify with Francis as he encountered God in nature and consequently experienced spiritual consolation and nourishment, beauty, solitude, and well-being (Sorrell, 1988).

**Connectedness to Nature**

Every day countless individuals choose to spend time outdoors for recreation, play, or gardening. The human being is relentlessly drawn to nature, thus signifying an intrinsic connection between humans and the natural world. The phenomenology of connectedness to nature has been a topic of interest for many scholars. Environmentalists such as Muir (1911) and Thoreau (1893) wrote about the mental health benefits of connecting with nature. For the purpose of this study, connectedness to nature is defined as the extent to which the view of nature is part of an individual's perception of his or her own sense of self and "the extent to which an individual includes nature within his or her cognitive representation" (cited in Mayer & Frantz, 2004, p. 504). This broad definition includes physical, cognitive, and emotional elements of that relationship. Consequently, Mayer and Frantz (2004) created the Connectedness to Nature Scale (CNS) in order to measure an individual's affective, experiential connection to nature.

Feeling connected to nature has powerful implication on a person's health and wellbeing. In ancient China, gardens were created to benefit the physical and mental health of the people. Early American history points toward Dr. Benjamin Rush who stated that "digging in the soil has a curative effect on the mentally ill" (Louv, 2005, p. 45). Long-held beliefs of Native American cultures speak of the relationship between psychological well-being and interactions with the ecosystem.

Recently, mental health professionals have joined this subject matter of connectedness to nature. Ecotherapy has, in the past decade, become a rapidly growing field of psychotherapy (Buzzell & Chalquist, 2009). Ecotherapy utilizes nature to facilitate and enhance psychological well-being and regards interactions with nature to impart healing and growth. Scholars in the field of psychology have shown interest in examining the link between nature and psychological well-being. For example, Mayer, Bruehlman-Senecal, and Dolliver (2009) found that exposure to nature had a beneficial effect on the complex social-emotional process of dealing with life problems. The findings indicated that spending time in the natural world helped people gain insight into their problems as well as enhanced their ability to reflect on possible solutions. Consequently, mental health professionals might benefit from recognizing the therapeutic potential of working with nature. Perceiving nature as a therapeutic ally for the betterment of clients can take many forms. Some ecotherapists believe in bringing clients outdoors to foster the human-nature relationship; others use metaphors found in

nature and direct clients to spend time outdoors to re-connect with one's ecological self.

In addition to mental health benefits, the natural world shows restorative effects on the physical body; these physical health benefits have been widely researched over the last few years. Consequently, researchers have been able to show that engagement in and exposure to the natural world decreases symptoms of stress and provided restorative qualities (Berto, 2005; Hartig, Evans, Jammer, Davis, & Gaerling, 2003; Kaplan, 1995; Wells & Evans, 2003). An emphasis on nature connectedness by mental health professionals might lead to a more effective approach to mental health treatment, thus promoting health, restoration, and psychological wellness.

**Spirituality and Its Relationship with Nature**

Nature has frequently been recognized as a sacred and spiritually rich place. Popular historical naturalists such as Muir, Emerson, and Thoreau spoke to the compelling spiritual quality found in the natural world. Muir (1901) described this sentiment when he wrote:

> Sequoias, kings of their race, growing close together like grass in a meadow, poised their brave domes and spires in the sky three hundred feet above the ferns and lilies that enameled the ground; towering serene through the long centuries, preaching God's forestry fresh from heaven. (p. 331)

Continuous exposure to nature can enhance a person's recognition of the interconnectedness shared with all creation, an awareness of shared origin and a mutual creator (Cummings, 1991). Consequently, the connectedness and sense of

oneness with nature are often described as spiritual elements and can be seen as a characteristic of spiritual health (Hawks, 2004). Experiences in nature have been known to inspire reverence and wonder as well as the sense of being part of something greater than oneself (Stynes & Stokowski,1996). For example, when investigating college students' experiences in outdoor programs, Loeffler (2004) found that participants acknowledged "a sense of higher purpose or power," "awe," and "beauty" (p. 544). Furthermore, participants favored the word *spiritual* to depict the profound connection they felt with the divine as a result of being in nature.

Past research has indicated a significant connection between spirituality and resilience. Research on individuals who have experienced crises has shown that faith in God, as well as a belief that all things work together for good, is positively associated with better adaptation (Loewenthal, 1995). There are many suggestions within the literature that religious faith and spirituality are important when going through trauma (e.g. Pargament, 1997; Pargament, Smith, Koenig, & Perez, 1998). The benefits provided by a spiritual outlook may include having an enhanced meaning of life, increased social support, and acceptance of difficulties consequently leading to a resilient life style.

**Construct of Spirituality**

Spirituality has been defined in many distinct ways. Moreover, the differentiation between religion and spirituality has been widely debated in the past; it has only been in the last few decades that a characteristic difference has become apparent (Hill et al., 2000). Zinnbauer and Pargament (2005) suggested

that "spirituality is defined as a personal or group search for the sacred. Religiousness is defined as a personal or group search for the sacred that unfolds within a traditional sacred context" (p. 35). This study will focus on the concept of spirituality; therefore it is helpful to be familiar with the definition offered by Frame (2003): "Spirituality includes one's values, beliefs, mission, awareness, subjectivity, experiences, sense of purpose and direction, and a kind of striving toward something greater than oneself. It may or may not include a deity" (p. 3). For the purpose of this study the concept of spirituality will be examined from two distinct viewpoints, namely spiritual transcendence and sanctification.

**Transcendence**. Transcendence can be understood as "the capacity of individuals to stand outside of their immediate sense of time and place and to view life from a larger, more objective perspective" (Piedmont, 1999, p. 988). An array of influential scholars such as James (1902/1958), Maslow (1976/1998), Jung (1960), and Csikszentmihalyi (1990) have written about transcendent experiences occurring in natural environments. Accordingly, a study conducted by Fredrickson and Anderson (1999) suggested that natural places promote transcendence due to nature's wealth of visual, auditory, olfactory, gustatory, and kinesthetic stimuli. Consequently people have reported feeling as if the place itself had come alive, providing spiritual inspiration. Cummings, in his latest written work *Eco-Spirituality* (1991) wrote of countless mystical human reactions in response to awe-inspiring encounters in nature. He believed such *creature-feelings* symbolize a person's perceived littleness and nothingness before the glory of God. Perhaps nature offers a sense of authentic belonging: being part of a

larger reality. Spiritual transcendence "emphasizes a personal search for connection with a larger sacredness" (Piedmont, 1999, p. 6). According to Piedmont, Ciarrochi, Cy-Liacco, and Williams (2009), the Spiritual Transcendence Scale (STS) was developed to evaluate how spirituality transpires to be a motivational force and consequently infuses personal meaning in individual lives.

**Sanctification.** The second construct, sanctification, views nature as a holy object itself. When people acknowledge an object or situation as having divine character, it provides meaning and significance in their lives. The term sanctification has particular meaning for different faith traditions. For example, in Jewish belief, sanctification involves being set apart from sin and made pure (Evans & Sanders, 1998). This study views sanctification as a psycho-spiritual construct, rather than exploring the theological meaning. Pargament and Mahoney (2002) developed a theoretical model in which sanctification is a person’s perception of something having divine character and significance. Therefore, sanctification would constitute nature as a manifestation of the divine or containing sacred qualities. “Nature can also be sanctified (i.e., consider nature to possess sacred qualities and/or experience nature as a manifestation of God), and hence, treated with more reverence and respect” (Tarakeshwar, Swank, Pargament, & Mahoney, 2001, p. 389). Furthermore, the experience of sanctification evokes spiritual emotions such as love, adoration, gratitude, and trepidation as well as the investment of personal resources such as time and money. In addition, a sacred object or situation can be a great personal resource and source of support; hence

the loss of the sacred can have harmful effects on a person's psychosocial and spiritual well-being. (Pargament & Mahoney, 2002).

**Psychological Well-being and Resiliency**

It is essential to understand the elements that affect psychological well-being as they can aid in the prevention of mental illness (Felner, Felner, & Silverman, 2000). This study was interested in the relationship between two personal aspects (i.e., connectedness to nature and spirituality) and psychological well-being. This study conceptualized well-being by way of two constructs, namely psychological well-being and resilience. Psychological well-being can be understood as a personal evaluation of one's own state of being. Ryff (1995) conceptualized psychological well-being through converging concepts such as life satisfaction, the balance of positive and negative affect, and quality of life. As a result, six dimensions of psychological well-being emerged: autonomy, environmental mastery, personal growth, positive relations with others, purpose in life, and self-acceptance. This study used the Ryff Scales of Psychological Well-Being (SPWB) which is a theoretically grounded instrument that specifically focuses on measuring the previously mentioned six dimensions of psychological well-being.

Resilience has been described as a dynamic process where individuals display positive adaptation despite experiences of significant adversity or trauma (Luthar & Cicchetti, 2000). At the heart of resilience research is the wish to uncover safety measures that can proactively help individuals to handle life's adversities. Richardson (2002) described three waves of research interests. The

first wave explored internal factors of resiliency such as personal qualities and protective factors such as self-esteem or support systems. The second wave focused on the processes involved in achieving such qualities. The third wave was of particular interest to this study. The third wave of resiliency inquiry, also known as resilience theory, investigates the motivational force or energy within a person. Resilience theory asserts that a force exists within an individual that encourages the development of self-actualization, altruism, wisdom, and harmony with a spiritual source of strength (Richardson, 2002).

For the purpose of this dissertation, in regard to resilience, the Connor-Davidson Resilience Scale (CD-RISC) was used to measure an individual's ability to cope with stressful situations and hardship. Connor and Davidson (2003) designed a measure that depicted seven facets of resiliency. The items integrated themes of personal competence, tolerance of negative affect, positive acceptance of change, trust in one's instincts, sense of social support, spiritual faith, and an action-oriented approach to problem solving (Connor & Davidson, 2003; Connor, Davidson, & Lee, 2003).

**Research Aims and Questions**

Previous research has established correlations between nature experiences and mental health (Berto, 2005; Kaplan, 1995; Nisbet, Zelenski, & Murphy, 2010; Shiota & Keltner, 2007; Wells & Evans, 2003); furthermore, a link has been established between spirituality and promotion of mental health (Koenig & Larson, 2001; Pargament, 1997; Richard & Bergin, 2005; Tarakeshwar et al., 2001). In addition, research has shown that being in nature can evoke strong

feelings of spirituality (Stringer & McAvoy, 1992; Williams & Harvey, 2001). The aim of this study is to investigate the interconnectedness of all these constructs. Specifically, this study will examine the relationship between connectedness to nature and psychological well-being in order to add empirical support to the theory that nature has the ability to help people develop buoyancy and consequently to maintain or improve their mental health. Moreover, this study is interested in assessing if spirituality partially mediates the relationship between connectedness to nature and psychological well-being and resilience. The general lack of empirical studies that have investigated nature's role in developing resilience, points to the under appreciation and neglect by the scientific community of the curative potential of nature (Mayer et al., 2009).

In accordance with these research aims, the following research questions emerged:

(a) Is there a relationship between connectedness to nature and overall psychological well-being?
(b) Is there a relationship between connectedness to nature and resilience?
(c) Is there a relationship between connectedness to nature and spirituality?
(d) What roles does spirituality play in the relationship between connectedness to nature and psychological well-being?

**Significance of this Study**

In an effort to demonstrate the relevance of this investigation to the counseling field, it is helpful to look at the wilderness therapy model, a form of outdoor travel that uses psychotherapeutic interventions. Wilderness therapy has

drawn its success from an integrative treatment model that assimilates well-established therapeutic interventions such as cognitive behavior modification with wilderness encounters (Russell, 2006). Consequently, such models have introduced mental health professionals to a new way of conducting therapy. This study continues the work of the wilderness therapy model while adding the crucial element of spirituality.

This study intends to highlight the healing potential of nature, used in a therapeutic setting. Presenting an experience of nature to a client may infuse the therapy with needed vigor and change of pace. Furthermore, conducting therapy in nature is an unorthodox approach which can ease many discomforts associated with traditional therapeutic counseling such as the often austere atmosphere of the counseling room. In a natural setting, the therapist can be perceived as a collaborator rather than an authority figure.

Mental health professionals are familiar with the perils of work-related stress and consequent burnout. Wicks (1998) has spoken of feeling at home in the peaceful surrounding of an English garden. He stressed the importance of finding quiet places to breathe deeply and insisted that counselors, in order to avoid burnout and foster personal resilience, need to make an effort to keep alive psychologically and spiritually. Nature is designed to meet that innermost need; the natural world is teeming with places that provide an ambience of peace and serenity. The implications of resilience and nature connectedness are wide reaching. They range from the ability to handling every day stressors to circumventing burnout of mental health professionals. Emphasizing the benefits

of connection to nature could lead to interventions designed to increase such connection, which in turn may contribute to increases in psychological well-being and resilience, resulting in overall enhancement of quality of life.

**Limitations of this Study**

Several limitations of this study must be taken into account. Regarding the use of student participants, a difference may exist between the participants who feel drawn to this type of research and those who took part exclusively because of the extra credit incentive. Those differences may impact the internal and external validity of the study. Furthermore, the representativeness of the sample is not guaranteed due to a lack of control over demographic variables and the possibility of sampling bias. In addition, this study did not capitalize on the benefits of true experimental research in which participants are exposed to or immersed in nature. This study investigates the connection to nature from merely a cognitive lens. Therefore people may not fully recognize and understand what connectedness to nature entails unless experienced on a physiological level.

# CHAPTER II

## Review of the Literature

This study aims to raise awareness of the unique and powerful integration of spirituality, ecology, and psychology. This combination is of extraordinary significance because it incorporates three profound levels of human connectedness: connectedness to the sacred, connectedness to nature, and connectedness to the human mind. Specifically, this study investigates how a connection to nature enhances psychological well-being, resilience, and spirituality. Previous research has established a positive relationship between being connected to nature and mental health; however this current study hypothesizes that an individual's spirituality is partially responsible for that positive relationship.

This review begins with an appraisal of the association between nature and spirituality. Next, the review explores the link between the concept of spirituality and its effects on mental health. Particularly, spirituality will be delineated by examining the constructs of spiritual transcendence and sanctification. Lastly, the literature review focuses on the concept of nature connectedness and its various mental health benefits in particular the effects of nature connectedness on resilience and psychological well-being.

### Nature and its Relationship with Spirituality

Every year millions of people flock to national parks, seeking wonder and awe, rest and tranquility. The possibility exists that people's desire to engage with nature is linked to a spiritual impulse. People frequently mention nature when referring to their personal spirituality; therefore, it is surprising how few empirical studies have explored the connection between nature experiences and spirituality. In addition, encountering the transcendent in nature is a sentiment shared by many people, yet there has been little

attention given to it by researchers. Frequent encounters in nature can be depicted as spiritual due to the sacred quality of a place. For example, Mazumdar and Mazumdar (1993) viewed the sacredness of people-place attachment and the consequent spiritual inspiration of that natural place as a global sentiment shared among the majority of religious people. The authors pointed out that most religious faiths share strong attachments to elements in nature such as the Judeo-Christian faith and the mountain of Zion, the Hindu faith and the attachment to the Ganges River, as well as the Buddhist faith and the Bodhi tree under which the Buddha meditated.

Frequently, individuals speak of spiritual experiences when recalling a time immersed in nature. For example, a study conducted by Stringer and McAvoy (1992) investigated whether the wilderness environment is contributing to spiritual experiences and development. The methodology used was based on the qualitative concept of naturalistic inquiry proposed by Lincoln and Guba (1985). Two wilderness adventure programs were offered to 26 participants. Group A consisted of 13 individuals who went on an 8-day canoeing trip. Group B consisted of 13 university students who went on a 10-day backpacking trip. The investigators conducted pre-trip questionnaires, on-site observations, and post-trip interviews. Participants in both groups shared common feelings such as excitement, happiness, joy, and self-confidence and felt cleansed and renewed in spirit. More specifically, most participants acknowledged that their awareness of spirituality increased while in the wilderness. In addition, participants shared the common theme of experiencing moments of intense emotions prompted by interaction with the natural environment. Important to note is also the widespread experience of powerful emotions associated with interactions with other participants. In addition to the

spiritual sensation of the wilderness environment, participants also perceived the connection with others and the sharing of a common spirit as a highly spiritual experience. Common themes emerged in both groups such as shared or common spirit between and among people; a power or authority greater than self; clarity of inner knowledge; inner feelings of peace, oneness, and strength; awareness of and attunement to the world and one's place in it; the way in which one relates to fellow humans and to the environment; and intangibility. During the interview process, participants shared profound insights such as the recognition of the unconquerable power of nature that elicits a sense of aliveness, inner peace, and closeness to God. Stringer and McAvoy's (1992) study found that nature is not only conducive to spiritual development but also intensifies spiritual experiences and the sense of connection to others. The researchers proposed to mental health professionals that nature outings have the potential to benefit clients in physical, mental, and spiritual ways.

Other studies in nature have focused on the experience of transcendence or "the capacity of individuals to stand outside of their immediate sense of time and place and to view life from a larger, more objective perspective" (Piedmont, 1999, p. 988). For the purposes of this study, spirituality is understood as a connection to a power greater than oneself; stated in relational terms, spirituality is seen as the transcendent relationship to the sacred or divine (Plante, Saucedo, & Rice, 2001). In recent years, a growing body of research strongly suggested that natural environments elicit transcendent experiences (Davis, Lockwood, & Wright, 1991; Williams & Harvey, 2001). Notable scholars of transcendent experiences such as William James, Margharita Laski, and Abraham Maslow found that nature has a close relationship with transcendent experience. Laski

(1961) reported that nature generates feelings of ecstasy more than any other trigger for non-religious people. Wilderness itself as well as wilderness activities (e.g., hiking, mountain biking) seem to serve as a conduits to such spiritual experiences.

Transcendence is often a powerful ingredient of spiritual experiences in environments such a wilderness or forest areas. For instance, a noteworthy qualitative study done by Marsh (2008) examined the spiritual meaning of backcountry wilderness experiences. Sixty-three participants, ranging in age from 26 to 35 years partook in the means-end laddering interviews. The interview questions concentrated on uncovering why people describe backcountry adventures as spiritual, particularly inquiring about values of the backcountry experience. The study identified transcendent experience (63%) as the main valued sensation, along with increased awareness of nature (46%) and a sense of fulfillment (29%). In another study, Williams and Harvey (2001) examined experiences of transcendence in forest environments. Participants were asked to describe a transcendent moment in a forest and rate the experience on a number of scales. The authors described transcendence as moments of extreme happiness, a feeling of lightness, freedom, and a sense of harmony with the whole world. Participants ($N$ = 131) were instructed to bring an episode of a transcendent moment in a forest to mind. The qualitative approach included a series of open ended questions regarding the transcendent experience. Data analysis revealed three underlying dimensions which characterized transcendent experiences in nature: fascination, novelty, and compatibility. These three factors were associated with certain positive experiences such as feeling humbled by nature's grandeur, feeling of being one with nature, heightened awareness of nature, and experience of peace and quiet.

Williams and Harvey (2001) found that there was a significant relationship between being in a forest environment and "feeling overwhelmed and fascinated by the forest, belief that the experience was caused by the forest and acute awareness of feelings in body and mind" (p. 252). The research further identified that transcendent experiences in nature instigate strong feelings of personal insignificance and humility when confronted with the enormity and vastness of the landscape. In summary, this study emphasized that transcendent experiences in nature are often characteristic of strong feelings of insignificance (diminutive) and strong feelings of compatibility and familiarity (flow).

Transcendence, as it applies to nature, is strongly related to the concept of awe. Awe can be understood as a feeling of wonder when experiencing something greater than oneself (Keltner & Haidt, 2003). According to Van Cappellen and Saroglou (2012), awe, love, and admiration are self-transcendent emotions because the emphasis is outside the self. Shiota, Keltner, and Mossman (2007) explored this concept and reported that nature (e.g., mountains, vistas, oceans) was the most common cause of the experience of awe. Furthermore, Shiota et al. (2007) were interested in the extent to which natural beauty elicits awe and the appraisal themes associated with the experience of awe. Next, the study compared experiences of awe with experiences of pride. Participants ($N = 60$) were undergraduate students enrolled in psychology classes at a university on the West Coast. Participants were randomly assigned to either the Nature or Accomplishment group and asked to recall a specific event in which they encountered a natural scene that was really beautiful (Nature group) or when they felt pride (Accomplishment group). Following the recall of the event, researchers asked the participants to describe their emotions by rating

the following words on a scale from 1 (*not appropriate at all*) to 7 (*very appropriate*): awe, contentment, excitement, fear, joy, love, pride, rapture, sadness, and surprise. In addition, participants were asked to rate how intense, personally meaningful, novel, challenging, and tiring the experience was. Participants in the Nature condition rated the words awe, rapture, love, and contentment more appropriate than the participants in the Accomplishment condition. Furthermore, the Nature condition participants gave higher ratings to “I felt small or insignificant,” “I felt the presence of something greater than myself,” “I felt connected with the world around me,” “I was unaware of my day-to-day concerns,” and “I did not want the experience to end.”

Nature not only elicits transcendence and fosters spiritual experiences, it also promotes a type of spiritual connection as research by Loeffler (2004) showed. Participants depicted their outdoor experiences using photo elicitation in which photographic images (taken by the participants during an expedition) helped the investigators gain insight into people’s sense of spiritual connection at the end of a wilderness expedition. For the study, 14 undergraduate students discussed the attributes of the experience and value of the photographs in explaining the experience. From an inductive thematic analysis, Loeffler discovered three themes that repeatedly surfaced from the data: (a) spiritual connection to the outdoors, (b) connection with others, and (c) self-discovery and gaining perspective. Participants frequently described a contemplative mindset in which the out-of-doors inspired connection to a higher purpose or power. Furthermore, the author found that participants used words such as awe, beauty, and spiritual to express the feeling of deep connection to the divine. One participant shared that:

> It is hard trying to explain the religious sense in nature. And you can use all the words like wonderful or awe but it is hard to really find the poetics that I think describe nature in words. It is more like communing with the land and this sense of awe that you get …it is kind of spiritual. (p. 545)

Most participants expressed frustration with finding the correct words to describe that spiritual sentiment. Some participants stated that their spiritual connection to the outdoor experience is the main motivation for entering into nature.

A potential element of spiritual connection is spiritual development and growth. For instance, Bobilya, Akey, and Mitchell (2009) conducted a study in which freshman students (*N*=11) at a Christian college participated in a wilderness orientation course. Their participation revealed one prominent theme: increased spiritual development through greater connection with God. In addition, the students' post-trip essays and interviews explained that their wilderness journey promoted spiritual development through an increased trust in God, an increased communion with God, an increased awareness of one's personal faith, and an environment that supports faith development. The previous studies revealed that nature has the ability to evoke feelings of transcendence and intense spiritual experiences and to foster a sense of connectedness between nature, the divine, and others.

The previously discussed research studies did not distinguish between the experiences of men and women. The following two studies were conducted with single gender participants; they echoed the previous findings, thus implying that people have powerful spiritual experiences in nature whether they are male or female. The first single gender study focused on the wilderness experiences of 12 female working professionals

between the ages of 26 and 55 who were willing to venture on an outdoor recreational trip (Fredrickson &Andersons, 1999). This qualitative investigation focused on wilderness experiences as a source of spiritual development, particularly spiritual inspiration or encouragement. The targeted participants were travelling exclusively with women and were steered towards engaging in more contemplative aspects of nature rather than participating in purely physical activities. This study collected data through on-site observations, personal field journals, and follow-up interviews. The personal trip journals revealed that certain words (e.g. uninhibited, peaceful, whole, refreshed, joyful, in tune, and enraptured) were used with significant frequency. The analysis of the interviews found that most participants experienced spiritual inspiration as a result of being in the wilderness. Also, most participants acknowledged becoming aware of and having made contact with a power greater than themselves. Participants described intense feelings of insignificance and interrelatedness of all life forms, which ultimately led to feelings of peace. Overall, this study found that most participants experienced spiritual inspiration, which was facilitated by the wilderness experience.

In a similar vein, Heintzman (2007) conducted a study with six men to investigate the wilderness experience and spirituality in a men-only group. The authors were interested in the long-term effects of the experience and, therefore, held the interviews 5 months after the completion of the trips. The data analysis detected six emerging themes: peacefulness, recollection, wilderness setting, variety of social settings, variable impact of spiritual activities, and ambivalence about a men-only group. Many results were consistent with the previous research, suggesting that wilderness settings are conducive to spiritual inspiration, growth, and development and the elicitation of awe.

These two single gender studies suggested that people regardless of gender enjoy spiritual development, spiritual experiences, and inspiration when in wilderness environments. An interesting difference to note here is that half of the male participants found the single sex grouping not an important aspect of the experience whereas most female participants endorsed the female only group as an important contribution to their positive experience.

As studies reported here have shown, nature has a multifaceted relationship with spirituality. Nature has the ability to evoke intense spiritual experiences such as interconnectedness, spiritual inspiration, and transcendence. Furthermore the Shiota et al. (2007) studies demonstrated that people frequently experience awe when engaging in nature. Participants used words such as awe, oneness, interrelatedness, and feelings of peace to depict their experiences. It seems that being in nature promotes connection to one's inner spiritual being in addition to facilitating spiritual growth. Therefore, the possibility exists that people's desire to engage with nature is linked to a spiritual impulse.

**The Concept of Spirituality**

A vast majority of people consider spirituality an essential ingredient of the holistic human experience. It is essential because a large number of individuals consider themselves as spiritual. In the United States, approximately 91% of Americans believe in God, and about 43% of all Americans attend religious services on a weekly basis (Newport, 2010/2011). In recent years, the distinction between religion and spirituality has become more pronounced. Spirituality is now more often described as personally transcending and meaningful, whereas religion is identified through the participation in formal, structural institutions such as a church or temple (Pargament, 1997; Spilka,

McIntosh, Milmoe, & Bickel, 1996). Furthermore, in 2001, a Gallup poll reported that people viewed spirituality as personal and individual rather than organized religion and church doctrine (Gallup, 2002). Spirituality has been considered a broader construct than religion. This broadness is reflected by the definition offered by Frame (2003): “Spirituality includes one’s values, beliefs, mission, awareness, subjectivity, experience, sense of purpose and direction, and a kind of striving toward something greater than oneself. It may or may not include the divine” (p.3).

Notably, spirituality is an exceedingly broad concept and has been defined in numerous ways. This study will examine the concept of spirituality from two distinct viewpoints namely spiritual transcendence and sanctification. Spiritual transcendence "emphasizes a personal search for connection with a larger sacredness" (Piedmont, 1999, p. 988). This transcendent nature of human spirituality "refers to the capacity of individuals to stand outside of their immediate sense of time and place to view life from a larger, more objective perspective" (Piedmont, 1999, p. 988). The second construct, sanctification, views nature as a holy object itself. When people acknowledge an object or situation as having divine character, it provides meaning and significance in their lives. Pargament and Mahoney (2002) developed a theoretical model in which sanctification is a person’s perception of something having divine character and significance. Therefore, it is hypothesized that sanctification would constitute nature as a manifestation of the divine or containing sacred qualities.

Spirituality is of interest to this study because of its connection to psychological well-being. The majority of people report that religious or spiritual beliefs provide meaning and purpose to their lives and aid in coping with life’s stressors (Oman &

Thoresen, 2003). In 1999, the American Psychological Association (APA) sponsored the National Multicultural Conference and Summit which recognized the importance of spirituality as a vital aspect of human life. Spirituality has been an area of fascination to notable scholars since the beginning of the field of psychology. For example, James (1902/1958) remarked that personal religious experiences are important facets of the subject of psychology and urged further investigations into the role of religion in mental health.

## Spirituality and Mental Health

**Psychological well-being**. In the present study, mental health is assessed through the concepts of psychological well-being and resilience. Psychological well-being has been of interest to the scholarly community for many years. Bradburn (1969) described psychological well-being as an act of balance between negative and positive affect. Additionally, a number of scholars (Andrews & McKennell, 1980; Andrews & Withey, 1976; Bryant & Veroff, 1982) have insisted that life satisfaction was essential in understanding happiness and psychological well-being. Clinical psychologists enhanced the understanding by adding descriptions of well-being through Maslow's (1943/1969) theory of self-actualization, Roger's (1961) narrative of the fully functioning person, Jung's (1933) concept of individuation, and Allport's (1961) formulation of maturity. Ryff and her colleagues (Ryff & Keyes, 1995; Ryff & Singer, 1996, 1998) analyzed the preceding theories and recognized specific areas of convergence in regard to positive psychological functioning. Consequently, the authors distinguished the most recurrent criteria of well-being and generated a multidimensional model of psychological wellness, which included six components. These components of positive psychological functioning

took account of positive evaluations of oneself and one's past life (Self-Acceptance), a sense of continuing growth and development as a person (Personal Growth), the belief that one's life is purposeful and meaningful (Purpose in Life), the possession of quality relations with others (Positive Relation with Others), to capacity to manage effectively one's life and surrounding world (Environmental Mastery), and a sense of self-determination (Autonomy; Ryff & Keyes, 1995, p. 720). According to Ryff's (1989, 1995) studies, the greater the fulfillment of these positive psychological functions, the higher one's overall psychological wellness. This study used the six subscales of the Psychological Well-Being Scales (Ryff, 1995) to assess the conceptual variable of psychological well-being. A more detailed description of the scale can be found in Chapter III.

Numerous studies have examined the multifaceted relationship between spirituality and well-being. Research in this area has supported the notion that spirituality has a positive effect on psychological well-being. According to research, people with active spiritual lives tend to be healthier and happier, maintain beneficial habits, and enjoy more social support (Harrison, Koenig, Hays, Eme-Akwari & Pargament, 2001; Pargament, 1997; Plante & Sherman, 2001; Plante & Thoresen, 2007; Richard & Bergin, 2005). Harrison, et al. (2001) investigated the association between religious or spiritual participation and psychological well-being; the review resulted in finding a significant relationship between religion or spirituality and well-being outcomes such as happiness, life satisfaction, and positive moods. The impact of the spiritual dimension of quality of life was captured in the following excerpt by Plante (2009):

> Overall, compelling high-quality research clearly supports the many mental, physical, and community health associations for those who engage in religious-spiritual activities. It may be likely that religious-spiritual people generally lead lifestyles that are more health promoting and less health damaging than those who are not religious or spiritual. The former also generally have a social support system through their church for religious community involvement. They may have a productive mechanism to cope with troubles through both intrinsic (e.g., personal prayer, mediation) and extrinsic (e.g., attending church services) religious-spiritual behaviors. (p. 28)

Van Dierendonck (2012) wanted to examine the relationship between spirituality and psychological well-being in more detail. Therefore, he attempted to identify spirituality as a key element of psychological well-being referred to as the *good life*. Furthermore, the author investigated the role of spirituality in Ryan and Deci's (2000) self-determination theory. Self-determination theory proposed that there are three basic psychological needs (autonomy, relatedness, and competence) each human being requires to achieve well-being and personal flourishing. The author hypothesized that spirituality is an additional determinant of the good life and will contribute variance above and beyond autonomy, relatedness, and competence. The study used an experimental scenario study design in which participants judged an imaginary person's well-being as desirable and morally good. Desirability can be understood as the extent to which one aspires to such a life. Moral goodness was described as possessing high ethical and moral values. The results from both samples found that spirituality added explained variance in addition to influencing the relationship among autonomy, competence, and relatedness to having a

good life. Overall, the authors found that spirituality may provide an extra psychological dimension for people to live the good life, both in terms of desirability and moral goodness. Van Dierendonck's (2012) study established that individuals tend to perceive spirituality as its own dimension of psychological well-being and an important resource in remaining psychologically healthy.

The review of the following two studies shows that spiritual coping, in particular, has a significant impact on psychological well-being. The first and most recent study (Lee, Besthorn, Bolin, & Jun, 2012) explored the role of stress and coping strategies on depression and life satisfaction in older adults. Specifically, the authors investigated how stress, support coping, spiritual coping, active coping, and avoidance coping are related to psychological well-being. In this study, psychological well-being was measured by assessing participants' depressive symptoms along with self-rating of life satisfaction. Participants (*N* = 316) were older adults (mean age of 82.6) who lived in assisted living facilities in Kansa, Missouri. Important measures used in this study included the Perceived Stress Scale (PSS10; Cohen, Kamarck, & Mermelstein, 1983); the Religious or Spiritual Coping Scale, one of six subscales from the Brief Multidimensional Measures of Religiousness Spirituality (Fetzer Institute & National Institute on Aging Working Group, 1999; Yoon & Lee, 2006); the Brief COPE scale, used to measure support, active, and avoidance coping (Meyer, 2001; Prado et al., 2004); the Geriatric Depression Scale-Short Form, used to measure levels of depression (Jang, Bergman, Schonfeld, & Molinari, 2006; Yesavage & Sheikh, 1986); and the Satisfaction With Life Scale, used to measure life satisfaction of older adults (Diener, Emmons, Larsen, & Griffin, 1985). Lee et al. (2012) conducted a hierarchical multiple regression, which indicated that spiritual

coping was significantly related to lower depression. The authors concluded that their study identified the significance of spiritual coping to the psychological well-being of inhabitants of assisted living facilities.

With respect to coping and well-being, Ahrens, Abeling, Ahmad, and Hinman (2010) investigated positive and negative religious coping on psychological well-being among female sexual assault survivors. The participants were at least 18 years of age (mean age 37.55), and the rape occurred after age 14. The recruitment process took part in Long Beach, California in communities with a high concentration of racially diverse, lower income population. This study used the Religious Coping Activities Scales or RCOPE (Pargament, Ensing, Falgout, & Olsen 1990). Specifically, the authors used the RCOPE's subscales of spiritual based coping, good deeds, and religious support that formed the positive religious coping scale. On the other hand, the subscales of discontent, plead, and religious avoidance formed the negative religious coping scale. In addition, the Center for Epidemiologic Studies Depression Scale (CES-D) was used to assess depression symptoms (Radloff, 1977); the Posttraumatic Diagnostic Scale was used to assess posttraumatic stress (Foa, Cashman, Jaycox, & Perry 1997); the positive affect subscale of Kammann and Flett's (1983) Affectometer 2 was used to measure psychological well-being; and the Posttraumatic Growth Inventory was used to assess posttraumatic growth (Tedeschi & Calhoun, 1996). In general, the results revealed that these sexual assault victims utilized spiritually based coping on an extremely high level. Spiritually based coping includes a sense of connection with a transcendent force and the belief in a greater benevolent meaning of life. A series of hierarchical linear regressions revealed that as levels of positive religious coping increased, levels of depression

decreased. Conversely, as levels of negative religious coping increased, levels of depression also increased. Lastly, hierarchical regression discovered that only positive religious coping was significantly related to psychological well-being; specifically, higher levels of positive religious coping were associated with an increased level of psychological well-being. In conclusion, the authors suggested that therapists and clergy be prepared to use positive religious coping with sexual assault victims because that might help the victims achieve higher levels of psychological well-being.

The previous studies reflected the impact of spirituality on psychological well-being. Specifically, spiritual and positive religious coping emerged as powerful components of psychological well-being. Sexual assault victims as well as elderly adults frequently used this type of coping; the study with the elderly population even reported that spiritual coping was significantly related to lower levels of depression. In general, spiritual coping is seen as a resource for living a psychologically health life.

**Resilience.** The concept of resilience is another substantial element of mental health. According to Benard (1995), resilience can be understood as a person's successful adaptation despite difficult or threatening conditions. Early research on resilience focused primarily on explaining the construct of resilience and identifying certain factors that enhance psychological thriving after adversity. Rutter (1985) was able to recognize that resilient people use past successes and positive emotions to contend with present adversities. In an extension of Rutter's study, Lyons (1991) discovered that qualities such as patience, tolerance, and optimism are also key factors in developing resilience.

Richardson (2002) described three waves of contemporary resiliency research. The first wave explored internal factors of resiliency such as personal qualities, assets, or

protective factors such as self-esteem or support systems. The second wave focused on the processes involved in achieving such qualities. The third wave is of particular interest to this study. The third wave of resiliency inquiry, also known as resilience theory, investigated the motivational force or energy within a person. Resilience theory asserts that a force exists within an individual that encourages the development of self-actualization, altruism, wisdom, and harmony with a spiritual source of strength (Richardson, 2002). Connor and Davidson (2003) designed a resiliency measure, which depicts seven facets of resiliency. The Connor-Davidson Resilience Scale (CD-RISC), described in detail in Chapter III, includes themes such as sense of personal competence, tolerance of negative affect, positive acceptance of change, trust in one’s instincts, sense of social support, spiritual faith, and an action-oriented approach to problem solving.

Particularly pertinent to this study, Walsh (2003) identified another important factor of resilient people: the spiritual concept of meaning-making. Walsh discussed that resilience is cultivated when family members are able to attach meaning to a challenging event and consequently view the situation in a positive way. Spirituality is able to infuse meaning to the suffering, and therefore it is a valuable resource during times of stress. Furthermore, Benard (1995) proposed that resilience encompasses social competence, problem-solving, critical consciousness, autonomy, and sense of purpose. Sense of purpose closely relates to the spiritual dimension of the meaning in life. Therefore, resilience and spirituality share fundamental qualities. McIntosh, Silver, and Wortman (1993) interviewed 124 parents who lost an infant to Sudden Infant Death Syndrome and found that the importance of one’s religion was directly related to more cognitive

processing of the loss and meaning attached to the suffering. When meaning was attached to the loss, less distress and greater well-being were reported.

In a more recent study, Greeff and Loubser (2008) qualitatively examined the concept of coping and meaning-making in the continent of Africa. Over 50 South African families were interviewed to investigate the role of spirituality in coping with adversity (e.g., death of a child or serious financial setback). Three open-ended questions were posed to assess coping as a family unit. The emerging themes clearly indicated spirituality as an important coping mechanism, in particular appreciation to God for the gift of family, God-given love for family members during crisis, divine guidance, trust in divine providence, divine presence, mobility, and prayer.

Spirituality is an important resource in developing resilience especially when struggling with devastating adversity such as the loss of a child. However, spiritual resources have a noteworthy impact on resiliency even when considering daily low-points. In a study conducted by Raftopoulos and Bates (2011), the role of spirituality in the development of resilience in adolescent boys and girls was investigated. Qualitative research interviews explored the participants' understanding of spirituality and its relevance to their day-to-day lives. They inquired about a low-point in their lives and coping skills used, in particular the role of spirituality, when dealing with the low-point situation. The low-points reported by the participants included changes in friendships including: break ups, bullying, family illness, grief, unplanned pregnancy, family conflict, uncertainty about the future, and exam stress. Furthermore, questions inquired about ways the participants experience spirituality. Subsequently they were presented with a list of spiritual attitudes or approaches and asked to indicate their preference. Grounded

theory techniques were used to analyze the data, and three key themes emerged. Predominately, three spiritual approaches emerged as noteworthy: sense of meaning and purpose, transcendental perspective, and connection to the inner self. The majority of participants described experiencing personal growth when looking at their ordeal from a perspective that “meaning and purpose are behind all events” (p. 160). The belief that difficult events have purpose facilitated adaptation in the face of adversity in this group of adolescents. Furthermore, participants described that a relationship with a higher power (categorized as transcendental perspective) provided them with the sense of unconditional love, support, and reassurance. One participant shared “[Spirituality] helps you with pathways. Spirit helps lead the way. Shows you what’s correct and right thing to do. It’s that knowing that you are not alone. That someone is there” (p. 161). Raftopoulos and Bates (2011) suggested that resiliency was positively influenced by the adolescent’s belief that a higher power was constantly there to provide love, guidance, and support. Five participants described coping with a low-point situation by connection to the inner self. The adolescents described finding inner connection by spending time alone with nature, music, and meditation/prayer. One participant described being in nature during difficult times:

> [The bush] is peaceful. There’s no cars, no noise and you just walk along the path and think and look at all the surroundings and it’s so peaceful . . . like the birds you have no worries. You can walk for as long as you want. There’s no deadline and no rush, everything is easy going. More relaxed I guess. (p. 162)

Connection with the inner self transpired when participants were spending time alone, which provided feelings of calm and consequently enabled them to develop self-

awareness, which also fosters problem solving abilities. Overall, this study provides considerable support for the beneficial role of spirituality in fostering resiliency in adolescents.

Spirituality has been established as an essential ingredient of overall human physical and mental health. Numerous individuals have beliefs of a spiritual nature and use spiritual coping in times of stress and unease. Spirituality has been empirically investigated and shown to positively relate to psychological well-being and resilience.

**Nature and Mental Health**

Nature is not only an underused psychotherapeutic resource but an important component of optimal functioning (Besthorn, 2005). The belief that contact with nature has extensive physical and a mental health benefit, is a long-standing and widespread notion. Recent efforts in the field of psychology are exploring a therapy model in which counselors guide clients towards the abundance of natural environments to facilitate mental health. This form of therapy has been advocated by respected philosophers and writers alike. Muir, Thoreau, and St. Francis frequently wrote passionately about the positive emotions that arose out of direct communion with nature. Muir’s (1916) writings described in great depth the connection between nature and wellness:

> Thousands of tired, nerve-shaken, over-civilized people are beginning to find out that going to the mountains is going home; that wilderness is a necessity; and that mountain parks and reservations are useful not only as fountains of timber, but as fountains of life…getting in touch with the nerves of the Mother Earth; jumping from rock to rock, feeling the life of them, learning

> the songs of them, panting in the whole-souled exercise, and
> rejoicing in deep, long-drawn breaths of pure wilderness. (p.4)

Muir's writings described an emotional relationship between individuals and the natural world. Ecopsychological theory places human psychology into an ecological context in which this emotional relationship is emphasized. Psychological processes are employed to understand this emotional bond. Consequently, ecopychology proposes an expansion of our sense of self to include all of nature (Fisher, 2002). In addition, ecopsychology contemplates the interplay between human psychology and humankind's extensively destructive environmental behavior.

Furthermore, Muir (1916) depicted the concept of biophilia, which suggests that all human beings share a deep-seated need to connect with nature. This ecological-evolutionary viewpoint assumes that human affiliation with nature has been advantageous to the survival of the species. Consequently, people continue to need contact with nature. This biological imperative is evident as people are continually drawn to the outdoors. Kellert and Wilson (1995) hypothesized that every human being experiences some degree of biophilia; that notion in turn generates scholarly interest in understanding the reasons behind humans' intrinsic connection to nature. An individual's inherent biophilia impacts his or her thoughts and feelings. The strength of connection varies and often depends on factors such as exposure to nature; however, it is still assumed that every human being possesses some degree of biophilia (Kellert & Wilson, 1995, Wilson, 1984). Therefore, it is imperative that empirical investigations continue to gain greater understanding of this instinctive and inborn connection to nature.

Time in nature is a valuable therapeutic resource for many people who suffer from anxiety, depression, and other mental health disorders that are exacerbated by the stresses of living in an overbuilt industrialized environment (Buzzell & Chalquist, 2009). The natural world and its restorative effects have been widely researched over the last few years. As a result, researchers have been able to show that engagement and exposure to the natural world decreases stress and provides restorative qualities (Berto, 2005; Hartig, et al., 2003; Kaplan, 1995; Wells & Evans, 2003).

An elaborate study done by Kaplan and Talbot (1983) investigated the psychological effects of engaging in a wilderness experience program. Participants reported an increase in awareness of a relationship with the natural environment and an increase in attention. Furthermore, participants reported an increase in self-confidence and feelings of tranquility, along with “a sense of union with something that is lasting, that is of enormous importance, and that they perceive larger than they are” (Kaplan & Talbot, 1983, p. 195). In addition, they found that wilderness experiences have the capacity to contribute to restoring people who feel overburdened by daily demands and facilitates coping with stressors. In accordance with Kaplan and Talbot’s (1983) research, an international research project demonstrated that contact with natural environments offered effective ways of obtaining restoration from stress and mental fatigue compared to outdoor urban environments (Health Council of The Netherlands, 2004). For example, the Health Council of the Netherlands has systematically reviewed such studies covering roughly 20 experimental studies in which participants were exposed to either natural environments or urban environments (simulated or real) with various types of measures

used (cognitive, physiological, or affective). All of these studies found superior recuperative outcomes from the natural environments compared to urban environments.

A more recent study done by Hartig et al. (2003) provided further evidence of the restorative properties of nature. Following extensive cognitive tasks, participants who walked along a wooded nature trail exhibited decreased blood pressure, whereas people who walked along city streets revealed an increase in blood pressure. Furthermore, this study found that performance on an attention test improved for people in the nature trail condition, while attention decline was noted for the urban walkers.

Scholarly evidence established a sizeable association between exposure to nature and a sense of restoration and ability to cope with stressors. Physiological and psychological recovery is an additional aspect of the nature-mental health relationship. Two classic studies conducted by Ulrich (1984) investigated the recovery process of hospital patients recovering from recent surgery. The study found that patients whose hospital rooms offered a window with views of trees required fewer painkillers compared to those whose window faced a brick wall. Patients with the nature view were able to leave the hospital approximately one day earlier and had less disapproval of the hospital staff. In the second classic study, Ulrich et al. (1991) had 120 participants view a stress evoking film in which automobile accidents and human violence were simulated. Afterwards the participants were exposed to either slides of nature images (e.g., a forest landscape with a stream) or a slide of urban environments (e.g., a commercial street with a shopping mall). Physiological measures such as an EKG and a muscle tension monitor, as well as a self assessment survey, examined the participant’s reactions to the stressful film and the consequent recovery images. The study found that recovery was faster and

more complete for the participants who were exposed to the nature images. Research has established that nature has a considerable impact on physiological and psychological restoration and recovery.

**Connectedness to Nature**

Connectedness to nature can be described as emotional affinity, attraction, or love toward nature. It is an individual's affective, experiential connection to nature. Nature connectedness, similar to a personality trait, is stable over time and is part of an individual's identity. (Hinds & Sparks, 2009; Mayer et al., 2009; Mayer & Frantz, 2004; Schultz, 2002). The concept of being connected to nature has recently gained scholastic interest, but research on this topic continues to be sparse. Connectedness to nature has been described and referred to in various ways (e.g., biophilia, sense of belonging to the nature world, nature relatedness, etc.) Therefore, it can be challenging to comprehend what the concept of connectedness to nature contains. For the purpose of this dissertation, connectedness to nature is conceptualized as an experiential sense of oneness or state of being in which a relational bond is felt toward nature. In other words, connectedness to nature is "an individual's sense of connection to the natural world" (Mayer & Frantz, 2004, p. 608). Consequently, connectedness to nature research investigates a person's emotional affiliation with nature rather than cognitions or viewpoints. Highly nature-connected individuals believe that they are part of nature to the same degree that animals and plants are part of nature, rather than viewing themselves as superior to nature (Schulz, 2004). Schultz (2002) perceived connectedness to nature as the "extent to which an individual includes nature within his or her cognitive representation of self" (cited in Mayer & Frantz, 2004, p. 504). Connectedness to nature has enjoyed recent recognition

as research is beginning to investigate this construct in relationship to the various elements of psychological well-being.

**Connectedness to nature and psychological well-being.** Several recent studies, conducted within the past 5 years, illuminated the relationship between connectedness to nature and psychological well-being. For example, Nisbet et al. (2010) emphasized the affective, cognitive, and experiential aspects of the human to nature relationship. The first study recruited 184 undergraduate students to complete measures of nature relatedness and well-being. In addition, there were measures of attitude and beliefs regarding the environment. This study assessed well-being by looking at emotional experience, sense of satisfaction, vitality, and psychological well-being. The second study replicated this design; however, the participants were 145 executive business people. Both studies established that nature relatedness was positively correlated with positive affect, vitality, autonomy, personal growth, and purpose in life after controlling for other environmental attitudes. Furthermore, the third study found that students enrolled in environmental classes throughout the fall semester were able to maintain a sense of connectedness to nature and in turn retain vitality, whereas the control group participants showed a decrease in nature relatedness and vitality. In all three studies, nature relatedness correlated with positive affect but was unrelated to negative affect.

Furthermore, Mayer et al. (2009) investigated nature’s beneficial effect on the complex socio-emotional process of dealing with life problems. The main purpose of that study was to explore connectedness to nature as a mediator variable between exposure to nature and the outcome variables of positive affect and ability to reflect. Seventy-six psychology students participated in this two-celled study (nature vs. urban). Initially, all

participants completed the Connectedness to Nature Scale (CNS) during class time. Subsequently, participants were randomly assigned to board two buses, one bus heading to an urban downtown area; the other bus drove to a nature preserve. Each group was instructed to "take in the scene" in silence and solitude. In addition, they were asked to "reflect on a loose end in their life" (p. 615). Following this, the participants completed the PANAS measuring positive and negative affect, connectedness to nature scale (CNS), situational self-awareness scale (SSAS), and an attention capacity measure. Furthermore, they rated their ability to reflect by indicating how prepared they felt to solve a specific problem. Findings indicated that spending time in nature was related to significantly more positive emotions and significantly greater ability to reflect on their loose ends than those in the urban environment. In addition, participants in the nature preserve made significantly fewer errors with the attention capacity measure. In addition, this study investigated the difference between real and virtual nature in relation to positive affect and ability to reflect. The second study largely replicated the effects of the first study; exposure to nature was positively correlated with connectedness to nature, positive affect, and the ability to reflect and negatively correlated with public self-awareness. However, this study found that participants in the real nature condition developed greater psychological benefits than did the individuals in the virtual nature conditions. Specifically, people actually in nature performed better on the reflection task. Both studies indicated that spending time in the natural world helps people gain insight into their problems as well as enhances one's ability to reflect on solutions.

In addition to vitality, positive emotions, and ability to reflect, mindfulness is also considered an element of psychological well-being. Two recent studies conducted by

Howell, Dopko, Passmore, and Buro (2011) examined the associations among connectedness to nature, well-being, and mindfulness. This analysis was based on data from a large (*N* = 452) undergraduate sample from an urban Canadian university. The scales used in the first study included the Connectedness to Nature Scale (Mayer & Frantz, 2004) and the Mindfulness Attention Awareness Scale (Brown & Ryan, 2003). In addition, a three factor structure to measure well-being was used (Keyes, 2005). The measure incorporated emotional well-being (e.g., positive affect, life satisfaction), psychological well-being (Ryff, 1989), and social well-being (e.g., social acceptance, social contribution, social coherence, and social interactions). Furthermore, Paulhus's (1994) Balanced Inquiry of Desired Responding was included to measure self-deceptive enhancement and impression management. A consistent positive correlation among nature connectedness and psychological well-being, and among nature connectedness and social well-being was found; however, nature connectedness and emotional well-being as well as nature connectedness and mindfulness were not significantly correlated. The second study continued to examine correlations among connectedness to nature, three-structure measure of well-being, and mindfulness; however, a more thorough analysis was conducted in which multiple indicators of each construct were employed. Again, the participants (*n* = 275) were recruited from the undergraduate population of a Canadian urban university. Once more, nature connectedness showed a positive association with psychological well-being and social well-being. Interestingly, mindfulness also had a significant correlation with nature connectedness when assessed by scales that highlighted the awareness component of mindfulness rather than the acceptance component. To conclude, the confirmatory factor analysis conducted on nature

connectedness, well-being, and mindfulness substantiated that "all three factors were significantly inter-related, such that higher degrees of connectedness to nature were associated with greater well-being and greater mindfulness" (p.169). Two consistent findings emerged across both studies. First, a significant positive correlation between nature connectedness and psychological well-being emerged. Second, a significant correlation between nature connectedness and social well-being emerged. These statistical relationships remained even when social desirability was controlled.

Research has established a positive correlated between connectedness to nature and numerous psychological well-being indicators. The previously reviewed studies indicated that various facets of psychological well-being such as mindfulness, vitality, autonomy, personal growth, purpose in life, positive emotions, and ability to reflect have an association with being connected to nature.

**Connectedness to nature and resilience.** Besthorn (2005), a pioneer in the field of nature integrated social work, has shared a strong belief in nature's ability to be a positive force and contributing element in the development of resilience. His words reflect the uncompromising conviction that helping professions are neglecting a great therapeutic potential: "human beings have a need – a biological imperative to connect with nature in order to maximize their potential and lead productive, fulfilling lives" (p.124). This study considers connectedness to nature an active agent in a person's development of resiliency. This hypothesis suggests that a strong emotional or attitudinal bond with nature will be positively associated with a high degree of resilience. The limited quantity of studies that investigate nature's role in developing resilience points to the under appreciation and failure by the social science community to notice the curative

potential of nature. The following studies provide evidence of the association between nature and resilience in child, adolescent, and adult populations.

An investigation of resiliency done by Wells and Evans (2003) examined rural children who were experiencing stressful life events such as family relocation, being bullied, and peer pressure. The study developed hypotheses to explore the capacity of nature to act as a buffer to life stresses. Two measures, maternal report and child self-report, were utilized to find out if adverse impacts of stressful life events would be less severe when nearby nature was drawn upon. The results of the study illustrated that stressful life events have less negative impacts under high nature conditions than low nature conditions. The noted effect was most pronounced among children who experienced the highest stress levels. The findings indicated that nature has the ability to provide a safeguard from stress for children who enjoy a lot of exposure to the outdoors. Wells and Evan's investigation provides a landmark for this study since it is unique in contributing evidence of nature's ability to enhance resilience. Furthermore, Ungar, Dumond, and McDonald (2005) investigated a number of outdoor interventions designed for at-risk youth and the consequential impact of the interventions on the development of resilience. Winter Treasures, (WT) an earth education model grounded in experiential education, facilitated numerous outdoor interventions during a one day excursion. Investigators designed a series of qualitative interview questions for 14 participants that inquired about their experiences and how they influenced their mental health. The majority of participants articulated a realization of a bond with the natural world. In addition, the themes of respect, exploration of identity, leadership roles, and meaningfulness emerged. Choice Wilderness Programming used outdoor interventions as

a form of wilderness therapy for treatment of drug addicted youth. At the most basic level, nature's forces demand team effort to secure shelter and consequent comfort. Written evaluation by the participants documented the overall sense of accomplishment and pride and willingness to participate in counseling sessions. Evaluations of participants' reactions to these outdoor programs showed that many themes associated with resilience emerged as positive outcomes from involvement with the outdoor based curriculum.

In a study conducted by Neill and Dias (2001), they found that exposure to challenges in nature boosted resiliency. The investigators studied resilience in a group of people who partook in a 22 day Outward Bound expedition and compared it with a control group. Neill and Dias proposed that resilience can be enhanced through the regular conquering of challenges in nature. They contended that:

> Development of psychological resilience can be seen as analogous to the immunization process. Just as immunity to infections is gained through the controlled exposure to a pathogen (rather than avoiding the pathogen), so too successful encountering of difficult challenges can provide a form of psychological inoculation. (p. 36)

Adventure programs such as Outward Bound provide numerous outdoor challenges, yet challenges can be met amidst social support and expert guidance. Forty-nine participants of the experimental group completed a resiliency assessment on the first and last day of the outdoor excursion. The control group consisted of college students who took the resilience measure on two different dates with a 3-week break in between. The overall change in resilience scores for the experimental group was very large, where the control group demonstrated small to moderate changes. All participants in the outdoor excursion

reported an increase in resiliency. Moreover, perceived social support was positively related to the growth in resilience during the excursion.

The previous findings lend credence to this study's hypothesis, which indicates that an individual's connectedness to nature is positively correlated to an individual's sense of resilience. In other words, this hypothesis suggests that a strongly resilient mindset that assists people in coping with and preparing for future adversity can be influenced by that person's bond to nature. Additionally, the findings from the Outward Bound study (Neill & Dias, 2001) revealed that confronting challenges in nature has a unique and positive effect on the development of resilience.

## Summary

The review of past research has demonstrated a strong link between (a) nature experiences and spirituality, (b) spirituality and psychological well-being and resilience, and (c) nature experiences and psychological well-being and resilience. In addition, researchers are now just beginning to move in the direction of directly applying measures of connectedness to nature to the categories of mental health and wellness. However, while recent research has touched upon some of the potential benefits of possessing strong sentiments of connectedness to nature such as vitality, positive emotions, and greater cognitive abilities, no studies have examined the explicit connection between sentiments of connectedness to nature, spirituality, and specific indicators of well-being, namely, psychological well-being and resilience. Therefore, the following specific aims and research questions were proposed.

## Research Aims and Hypotheses

This study addressed three specific research aims: (a) to explore the relationship between connectedness to nature and well-being, specifically psychological well-being and resilience; (b) to explore the relationship between connectedness to nature and spirituality, specifically spiritual transcendence and sanctification; (c) to explore spirituality as a potential mediator between connectedness to nature and well-being.

The details of the relationship between connectedness to nature and mental health are not clear. For instance, what mechanism underlies the connection between experiences in nature and well-being? This study aims to address this question. A major goal of this study is to determine what mediates the relationship between connectedness to nature and well-being. In particular, this investigation examines whether spirituality, measured by a spiritual transcendence scale and a sanctification of nature scale, mediates the relationship between connectedness to nature and well-being. This study expects to find a significant relationship between the predictor (connectedness to nature) and outcome variable (well-being), while also examining the potential mediator effect of spirituality. This study addresses the research aims by investigating six hypotheses:

Hypothesis 1: Higher levels of Connectedness to nature (CN) will be associated with (a) higher levels of resilience and (b) higher levels of psychological well-being.

Hypothesis 2: Higher levels of CN will be associated with higher levels of spiritual transcendence.

Hypothesis 3: Higher levels of CN will be associated with higher levels of sanctification of nature.

Hypothesis 4: (4a) Sanctification and (4b) Spiritual Transcendence will predict resilience above and beyond CN (even after controlling for significant covariates including demographic variables and global religiousness).

Hypothesis 5: (5a) Sanctification and (5b) Spiritual Transcendence will predict psychological well-being above and beyond CN (even after controlling for significant covariates including demographic variables and global religiousness).

Hypothesis 6: Spirituality will act as a partial mediator between CN and resilience and between CN and psychological well-being. (6a). Sanctification of nature will act as a partial mediator between CN and resilience. (6b) Sanctification of nature will act as a partial mediator between CN and psychological well-being. (6c) Spiritual Transcendence will act as a partial mediator between CN and resilience. (6d) Spiritual Transcendence will act as a partial mediator between CN and psychological well-being.

This study may contribute meaningfully to the research base because it will clarify the relationship between engagement in nature and indicators of psychological well-being. If these hypotheses are supported, an argument could be made that the mental health field would benefit from integrating nature and spirituality into treatment. This could lead to interventions designed to increase nature exposure, which in turn, may contribute to increases in spiritual and psychological health.

# CHAPTER III

## Method

The purpose of this chapter is to present the methodology that was used in the proposed study. This includes a description of the sample, procedures, measures, and the research hypotheses.

### Sample

The participants of this study were undergraduate psychology and communications students from a mid-size public university in a suburban area of central Maryland. These students received an invitation from their class instructor to participate in a study on connectedness to nature during the spring semester of 2014. In order to promote diversity of students, participants were recruited from various sections of psychology and communications classes. In the class presentation, the students were given the opportunity to participate in this study as one possible way to obtain course credit. The instructors of the classes stated that the university valued continued research and that there was an opportunity to enhance the scientific understanding of the construct of connectedness to nature. Furthermore, the students were informed of the study's title (*Connectedness to Nature*) and the time commitment required (approximately 30 minutes). Interested students were given a link to access Psych Data. The Psych Data website provided all relevant information, including informed consent and survey materials. The consent form (see Appendix A) included information on the study, the risks and benefits of the study, the information on confidentiality, and the procedure for participating in the study. Furthermore, the participants were informed of the approximately 30 minute time commitment. All measures were collected online using Psych Data.

## Participants

The study sample included 163 undergraduate students, ranging in age from 18 to 45 years (mean = 20.8). The majority of participants were female (82 %), White (75%), and living in suburban environments (66%), and over one-half (52%) worked part-time. Several religious affiliations were endorsed including Protestant (31%), Catholic (29%), Jewish (8%), Buddhist (2%), Orthodox (1%), Other/Atheistic/Agnostic/ Pantheism/Deism (12%), and None (17%). See Table 1 for detailed demographic data.

This sample, to some extent, resembled the student body as the university's diversity profile demonstrates 65% White enrollment in addition to 60% women (Towson University Office of Institutional Research, 2013). Therefore, the current sample slightly over represents the White and female student body.

Although there have been no previous studies that provide directly comparable data, the effect size estimate was based on one previous investigation which noted a correlation of $r$ (76) = .54 between connection to nature and positive affect (Mayer et al., 2009). Power analysis was conducted using GPower 3.1 software. The α for the test of this model was set at .05. To achieve power of .80 and a medium effect size ($f^2 = .15$), a sample size of 119 is required to detect significance. Thus, the sample size of 163 was larger than needed to detect significance associated between variables.

## Measures

**Demographics.** Participants were given a demographic form (see Appendix B) that addressed age, gender, ethnicity, college major, religious affiliation (if any), and location of the current place of residence (urban vs. suburban vs. rural). In addition to these basic demographics, other characteristics related to religious preference, degree of

religiousness, degree of spirituality, amount of private prayer, and religious or spiritual service attendance were assessed.

Table 1

*Demographic Characteristics of Participants (N = 163)*

| Characteristic | n | % |
|---|---|---|
| Age at time of survey (years) | | |
| 18-20 | 101 | 62.1 |
| 21-23 | 46 | 28.2 |
| 24-26 | 11 | 6.7 |
| 27-29 | 2 | 1.2 |
| 30+ | 3 | 1.8 |
| Gender | | |
| Female | 134 | 82.2 |
| Male | 29 | 17.8 |
| Living environment | | |
| Rural | 17 | 10.4 |
| Suburban | 107 | 65.6 |
| Urban | 38 | 23.3 |
| Other | 1 | .6 |
| Race/Ethnicity | | |
| Asian | 6 | 3.7 |
| African American | 19 | 11.7 |
| Hispanic | 4 | 2.5 |
| White | 122 | 74.8 |
| Mixed race | 12 | 7.4 |
| Employment | | |
| Full-time | 11 | 6.7 |
| Part-time | 86 | 52.8 |
| Seasonally | 26 | 16.0 |
| No, can't find job | 10 | 6.1 |
| No, choose not to work | 30 | 18.4 |
| Religion | | |
| Protestant | 51 | 31.3 |
| Catholic | 47 | 28.8 |
| Jewish | 13 | 8.0 |
| Buddhist | 3 | 1.8 |
| Orthodox | 2 | 1.2 |
| Other * | 47 | 28.9 |
| None | 28 | 17.2 |

*Note:* * "Other" included Agnostic, Atheist, Pantheist, and Deism.

**Connectedness to Nature Scale**. Two measures were used to assess this concept: the Connectedness to Nature Scale (CNS) and the Nature Relatedness scale (NR). Mayer and Frantz (2004) created the 14-item CNS in order to measure an individual's affective, experiential connection to nature. The CNS was built on the work of Leopold (1949) who believed that nature-connected people care more deeply about the state of the earth. Mayer and Frantz (2004) operationalized connectedness to nature to examine a person's sense of relatedness to nature. The scale has shown acceptable internal consistency ($\alpha$ = .84) and test-retest reliability ($r$ = .79). Sample items include, "I often feel a sense of oneness with the natural world around me," "I think of the natural world as a community to which I belong," and "I often feel a kinship with animals and plants" (Mayer & Frantz, 2004). In addition, the scale has also demonstrated a correlation with values that focus on the well-being of living things ($r$ =.49; Schultz, 2000) and the New Ecological Paradigm Scale ($r$ = .35; Stern & Dietz, 1994), which measures pro environmental attitudes such as concern for the welfare of the planet. Six data sets (Frantz, Mayer, Norton, & Rock, 2005; Mayer & Frantz, 2004) have confirmed the relationships between the CNS and degree of life satisfaction and the CNS and overall happiness in student and community samples, respectively. In the current study, the CNS showed good internal consistency ($\alpha$ = .80). However, some research (Perrin & Benassi, 2009) has suggested that the measure has inherent limitations. Perrin and Benassi reanalyzed Mayer and Frantz's (2004) data and conducted a content analysis of the CNS scale items. They concluded that the CNS actually assesses cognitive attitudes rather than emotional connectedness. Further results indicated that the self-referential nature of the CNS items may be responsible for the weak to moderate correlation between the CNS and New Ecological Paradigm Scale.

Another noteworthy limitation is that the CNS does not include a physical component of connectedness to nature. Nisbet et al. (2009) insisted that such a physical component is crucial in determining an operational definition of connectedness to nature.

**Nature Relatedness Scale.** Because of these limitations and concerns this study used an additional scale to measure connectedness to nature, the Nature Relatedness scale (NR). Nisbet et al. (2009) designed this to measure the affective, cognitive, and physical relationships between nature and humans. The scale consists of 21 items and was rated on a 5-point Likert scale. This measure assesses the interconnectedness of life by exploring a person's sense of appreciation and understanding of such interconnectedness. The NR loaded onto three distinct factors: NR Self, NR Perspective, and NR Experience. NR Self includes an internal identification with nature, "My relationship to nature is an important part of who I am." NR Perspective included an external connection to nature that highlights the human impact on the natural worlds, "Human's have the right to use natural resources any way they want." NR Experience included the physical interaction with nature, "I enjoy being outdoors, even in unpleasant weather." Nisbet et al. (2009) reported Chronbach's alpha for the full NR scale was .87, .84 for NR-Self, .66 for NR-Perspective, and .80 for NR-Experience, demonstrating acceptable internal consistency. In addition, the current study's alpha for the full NR scale was .85, .80 for the NR-Self, .54 for NR-Perspective, and .84 for NR-Experience. Test-retest correlations over a 6-to-8 week period were .85 for NR, .81 for NR Self, .65 for NR-Perspective, and .85 for NR-Experience (Nisbet et al., 2009). Furthermore, the authors established construct validity by demonstrating that higher NR scores were linked to constructs such as concern for the environment and identification as an environmental activist or outdoor enthusiast.

**Spiritual Transcendence Scale.** Two measures were used to assess participants' spirituality, namely the Spiritual Transcendence Scale and the Sanctification Scale. The 24-item Spiritual Transcendence Scale (STS; Piedmont et al., 2009) was created to describe personal characteristics that are not contained within the Five-Factor Model of Personality. The STS was developed in 1999 by Piedmont who conducted a study using two separate samples, a developmental sample of 379 college students and a validation sample of 356 students. Piedmont (2009) argued that spiritual transcendence is a separate domain of personality. He described the three components of spiritual transcendence as:

> A sense of *connectedness*, a belief that one is part of a larger human orchestra whose contribution is indispensable in creating life's continuing harmony; *universality*, a belief in the unitize nature of life; *prayer fulfillment*, feelings of joy, and contentment that result from personal encounters with a transcendent reality (p. 989).

Sample items include: "I meditate and/ or pray so that I can reach a higher spiritual plane of consciousness (prayer fulfillment)," "There is a higher plane of consciousness or spirituality that binds all people (universality)," and "It is important for me to give something back to my community(connectedness)." Piedmont (1999) also developed a version of the STS that allows for peer evaluation. Both the self-report and peer version have shown acceptable reliabilities: .83, .87, and .64 for Universality, Prayer Fulfillment, and Connectedness, respectively for the self-report version and .91, .87, and .72, respectively for the peer version. In 2001, Piedmont continued to assess the psychometric validity of the STS. Using a similar sample of college students, 322 subjects completed the STS as well as several other assessments that measured attitudes

and personality traits commonly associated with spirituality and religion (Piedmont, 2001). Furthermore, each participant was asked to recruit two acquaintances who rated them on several scales. The psychometric results found that the STS had acceptable reliability, except for the Connectedness subscale, which exhibited a gender difference (Piedmont, 2001). Women scored significantly higher than men on the self-reported version of the Connectedness subscale $t(318) = 2.38$, $p < .05$. For the self report version, the Universality and Prayer Fulfillment subscales both had good internal consistency alpha of .82. The Connectedness subscale had a much lower internal consistency alpha of .58.The current study demonstrated alpha reliabilities of .85 for the full scale, .82 for Universality; and .78 for Prayer Fulfillment; the Connectedness subscale had a much lower internal consistency alpha of .53, which is considered poor. Therefore, after examination of the internal consistency of the Connectedness scale in this sample, the Universality and Prayer Fulfillment subscales were used exclusively.

**Sanctification Scale**. Sanctification occurs when an individual perceives an aspect of life as having sacred or divine meaning. The Sanctification scale consists of two discrete measures: the non-theistic Perceived Sacred Qualities (PSQ) Scale and the theistic Manifestations of God (MOG) scale (Mahoney et al., 1999; Pargament & Mahoney, 2002). The PSQ focuses on sacred qualities or characteristics associated with the divine. For example, the PSQ was used in an investigation of the sanctification of marriage (Mahoney et al., 1999) which examined spousal perceptions regarding sacred qualities of the marital relationship. The scale asked participants to endorse the degree to which sacred qualities such as holy or blessed applied to their marriage. The second scale included in the sanctification scale was the MOG scale which explored an individual's

experience of God in relation to the construct of interest. For example, in the sanctification of marriage study one item asked if God is present in one's marriage. This scale measured a person's perception of the manifestation of God and investigated the experience of a higher being. The MOG scale did not endorse a particular type of God.

All items of the sanctification scale were developed for the use with an adult population. Initial psychometric evaluations of the scales indicated strong reliability with Cronbach's alphas of the MOG and PSQ scales: .97 and .87 (Mahoney et al., 1999). An extensive series of sanctification studies, each with its own adaptation of the sanctification scale based on the topic of study, has been conducted. Consistently high Cronbach's alphas have been reported such as in Phillips and Pargament (2002) sanctification of dreaming (.96, .90), Mahoney, Carels, et al. (2005) sanctification of the body (.98, .95), Mahoney, Pargament, et al. (2005) sanctification of personal striving (.96, .93), Murray-Swank, Mahoney, and Pargament (2006) sanctification of parenting (.98, .74) and Murray-Swank, Pargament, and Mahoney (2005) sanctification of sexuality (.95, .90). Furthermore, both scales have possessed strong internal reliability with each adaptation, which indicates sanctification is a robust psychological construct. The current study also demonstrated good internal consistency (.89, .98).

**Sanctification of Nature Scale.** Sanctification of nature was assessed by adapting the scales from the work on sanctification of the body by Mahoney, Carels, et al. (2005) which, for the purposes of this research, were called Perceived Sacred Qualities of Nature scale and Manifestations of God in Nature scale. In other words, the present study adapted the Mahoney, Carels et al. (2005) scales to correspond with the construct of

sanctification of nature. Minimal changes to the scales were made; the majority of alteration consisted of substituting the word “body” with “nature.”

*Manifestation of God in Nature Scale*. Participants used the 7-point Likert scale with the anchor points of *strongly disagree* (1) and *strongly agree* (7) to express their concurrence with the following 12 statements: nature is a temple of God; nature is created in God's image; nature is a gift from God; God is present in nature; God uses nature to do God's will; nature is united with God; nature is bonded to the everlasting Spirit of God; a spark of the divine resides in nature; God lives through nature; God is glorified through nature; nature is an instrument of God; and the power of God moves through nature.

*Sacred Qualities of Nature Scale.* Participants completed a 10-item Sacred Qualities of Nature Scale to assess the degree to which nature is recognized as having sacred qualities. Participants used a 7-point Likert scale with the anchor points of *does not describe at all* (1) and *very closely describes* (7) to indicate the degree to which the following words applied to the nature: “blessed," “holy,” “sacred," “mysterious,” "miraculous," "divine," "awesome," "spirit-filled," "heavenly," and "religious."

**Psychological Well-being.** Two measures were used to assess participants’ psychological well-being, namely the Scales of Psychological Well-Being (SPWB; Ryff, 1995) and the Connor-Davidson Resilience Scale (CD-RISC; Connor & Davidson, 2003). In 1985, Ryff began to design an instrument to measure the fundamental properties of psychological well-being. According to Ryff, psychological well-being could be accurately assessed through the 54-item *Psychological Well-Being Scales* (Ryff, 1995). This measure contained six subscales. Ryff (1995) conceptualized psychological wellness as the satisfaction of particular needs. These needs encompass six dimensions: autonomy,

environmental mastery, personal growth, positive relations with others, purpose in life, and self-acceptance. Ryff and Keyes (1995) provided an example to illustrate this conceptualization:

> a high scorer on self-acceptance possesses a positive attitude toward the self; acknowledges and accepts multiple aspects of self including good and bad qualities; [and] feels positive about past life, while a low scorer on this same scale feels dissatisfied with self; is disappointed with what has occurred with past life; is troubled about certain personal qualities; [and] wishes to be different than what he or she is. (p. 1071)

Examples of items from each dimension are: “I like most aspects of my personality” (self acceptance), “People would describe me as a giving person, willing to share my time with others” (positive relations with others), “My decisions are not usually influenced by what everyone else is doing”( autonomy), “In general, I feel I am in charge of the situation in which I live” (environmental mastery), “I am an active person in carrying out the plans I set for myself“ (purpose in life), and “I have a sense that I have developed a lot as a person over time” (personal growth). The participants were asked to evaluate each statement with the 6-point Likert scale, (1) *strongly disagree,* (2) *disagree,* (3) *disagree slightly,* (4) *agree slightly,* (5) *agree,* and (6) *strongly agree*. Each subscale consists of nine items. Internal consistency reliability for each of the subscales is good to excellent: autonomy ($\alpha$ =.82), environmental mastery ($\alpha$ =.91), personal growth ($\alpha$ =.91), positive relations with others ($\alpha$ =.87), purpose in life ($\alpha$ = 0.91), and self-acceptance ($\alpha$ = 0.92). Furthermore, the SPWB scale showed good 6 week test-retest reliability of .81-.88

(Ryff, 1995). As indicated in table 5, the current study also demonstrated high alpha reliability greater than .80 for all SPWB subscales.

**Connor-Davidson Resilience Scale.** The Connor-Davidson Resilience Scale; CD-RISC (Connor & Davidson, 2003) was used to measure resiliency. The content of the scale was drawn from previous studies on the characteristics of resilient individuals. The authors embraced Kobasa's (1979) work on hardiness, control, commitment, and change viewed as challenge. Furthermore, the scale included elements of Rutter's (1985) work such as action orientation, goal setting, self-esteem, confidence, problem solving skills, and humor in the face of stress. The 25-item CD-RISC was designed for use in adult populations. Participants rated how true each statement was for them. Sample items included: "I am able to adapt when changes occur," "I try to see the humorous side of things when I am faced with problems," "Sometimes fate or God can help me," "I can deal with whatever comes," and "Past success give me confidence for new challenge." A Likert scale was used where (0) *is not true at all,* (1) *is rarely true,* (2) *is sometimes true,* (3) *is often true,* and (4) *is true nearly all the time* (Connor & Davidson, 2003).

The CD-RISC has demonstrated good internal consistency ($\alpha = .89$) and high test-retest reliability (.81-.88) with an adult population(Connor & Davidson, 2003). Convergent validity was confirmed by significant positive correlations with the Kobasa hardiness measure (Kobasa, 1979) and the Sheehan Social Support Scale (Sheehan, Raj, Harnett, & Sheehan, 1990) and significant negative correlations with the Perceived Stress Scale (Cohen et al., 1983), the Stress Vulnerability Scale (Sheehan et al., 1990), and Disability Scales (Sheehan, 1983). Furthermore, the current study also demonstrated high internal consistency ($\alpha = .93$). Discriminant validity was demonstrated in the CD-RISC

using the Arizona Sexual Experience Scale (McGahuey, Gelenberg, Laukes, Moreno, & Delgado, 2000).

**Research Design and Procedures**

Permission to conduct this study was obtained from Loyola University's Institutional Review Board (IRB). Data collection took place at a medium size public university in Maryland. Preliminary analyses were performed to examine the distribution of scores, screen the data, and examine reliability. Bivariate correlations were conducted to test hypotheses 1 through 3. To test the incremental validity of Sanctification and Spiritual Transcendence in the prediction of resilience and psychological well-being, hierarchical multiple regression was conducted for hypotheses 4 and 5. Specifically, a three-step regression equation was conducted for each dependent variable; (Resilience & Psychological Well-Being). Step 1 included control variables, step 2 included CN, and step 3 included Sanctification. The same model was carried out again with the modification that Sanctification was replaced with Spiritual Transcendence. A major goal of this study was to determine if spirituality mediated the relationship between CN and well-being. Baron and Kenny's (1986) procedure was used for establishing whether mediation had occurred. To test for mediation, the Independent Variable (IV) must be significantly related to the potential mediator and the DV; the mediator must have a significant relationship with the DV, and the relationship between the IV and DV should be partially eliminated when the mediator is controlled for (see Figure 1 for mediation pathway). A series of regression equations and the Sobel test (Sobel, 1982) were used to test for mediation. Three separate regression equations were calculated. First, the potential mediator (spirituality) was regressed on the IV; secondly the DV was regressed

on the IV. Thirdly, the DV was regressed on the IV and the potential mediator. Mediation is indicated when the effect of the IV on the DV is less in the third equation than in the second (Baron & Kenny, 1986). This is determined by comparing standardized beta coefficients from equations 2 and 3 (the standardized beta coefficient should be less in equation 3 than in equation 2). To provide a more formal assessment of mediation effects, Sobel (1982) tests were also conducted. This test assessed whether the indirect effect of the IV on the DV via the mediator was significantly different from zero (see also MacKinnon, Lockwood, Hoffman, West, & Sheets, 2002).

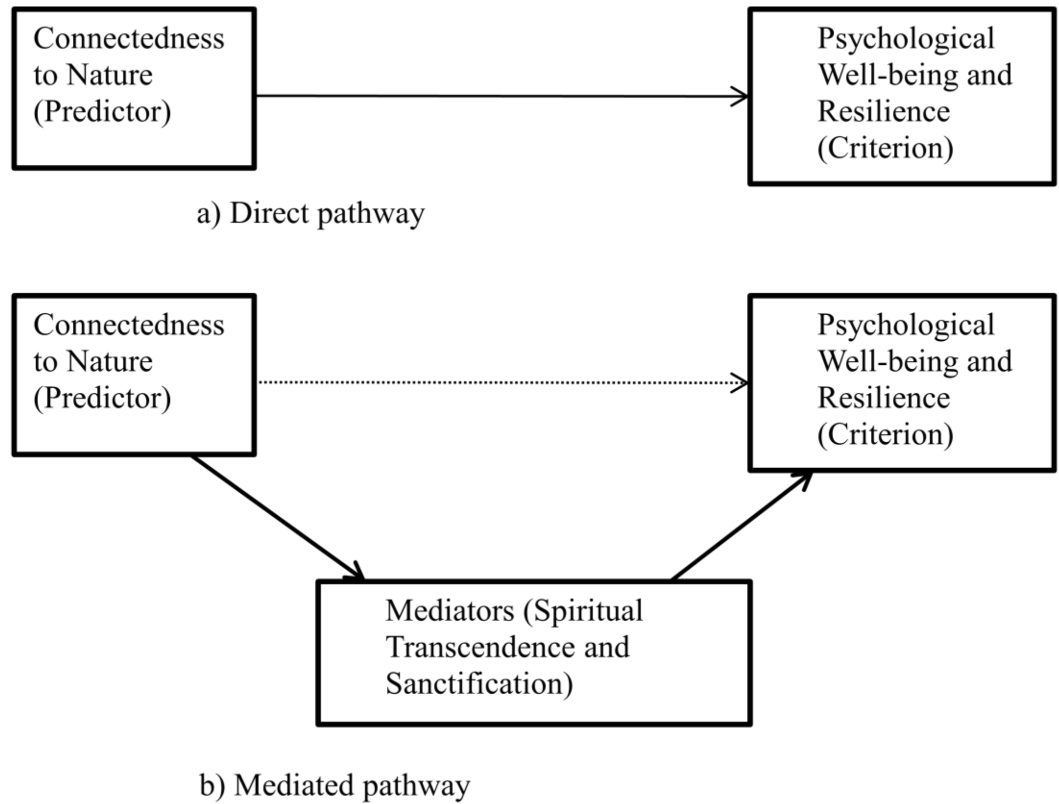


*Figure 1.* Mediation Model for Spirituality as a Mediator of the Relationship between Connectedness to Nature and Psychological Well-being.

# CHAPTER IV

## Results

### Preliminary Analysis

The first section of the results provides a description of the preliminary analyses that were conducted to examine the distribution of the scores, screen the data, and examine reliability. Data were collected from 181 individual respondents, of whom 18 did not complete the majority of study questions and were removed from analyses. Additionally, missing values for respondents (N= 28) who gave answers to at least 85% of items on a scale were replaced with the mean score of the sample for that variable (George & Mallery, 2010). The subsequent sample size of 163 was sufficient to conduct all analyses. Furthermore, appropriate scale items were reverse scored and summed before proceeding with analyses.

Frequency distributions for all variables were obtained in order to assess skewness, kurtosis, and the normalcy of the distribution. In addition, histograms, box plots, and scatter plots were constructed and revealed that all variables met the assumptions of linearity and normality required for subsequent analyses. These procedures identified all potential outliers and concluded that they were within an acceptable range of three standard deviations from the respective means.

### Demographics

In addition to the race, gender, and religious affiliation (described in the previous chapter), further demographic inquiries included global religiousness. Tables 2 through 4 display the frequency of global religiousness behaviors and self-perceptions endorsed by participants. Of the sample 68.1% considered themselves as at least slightly religious compared to 31.9% of the sample who identified as either not at all religious (30.7%) or

Table 2

*Global Religiousness Question 1-2*

| | Very | Moderately | Slightly | Not at all | N/A |
|---|---|---|---|---|---|
| To what extent do you consider yourself a religious person? | 4.9% | 32.5% | 30.7% | 30.7% | 1.2% |
| To what extent do you consider yourself a spiritual person? | 14.7% | 40.5% | 31.9% | 9.8% | 3.1% |

*Note. N=163*

Table 3

*Global Religiousness Question 3*

| | Once a day | More than once a day | Once a week | A few times a week | Once a month | A few times a month | Less than once a month | Never |
|---|---|---|---|---|---|---|---|---|
| How often do you pray privately in places other than a church or synagogue? | 11.7% | 12.9% | 12.9% | 9.8% | 8.6% | 3.7% | 16.6% | 23.9% |

*Note*. *N*=163.

Table 4

*Global Religiousness Question 4*

| | Several times a week | Every week | Nearly every week | 2-3 times per month | About once a month | Several times a year | About 1-2 times a year | Less than once a year | N Neve r |
|---|---|---|---|---|---|---|---|---|---|
| How often do you attend religious or spiritual services? | 1.8% | 11% | 8% | 16.6% | 3.1% | 19% | 7.4% | 15.3% | 17.8 |

*Note*. N=163

religiousness was not applicable (1.2%). Furthermore, 87.1% considered themselves as at least slightly spiritual compared to 12.9% of the sample who identified as either not at all spiritual (9.8%) or spirituality was not applicable (3.1%).

As indicated in Table 3, when responses to "How often do you pray privately in places other than a church or synagogue" were examined, more than three-quarters (75.5%) of the participants reported praying on a daily, weekly or monthly basis. Furthermore, 82.2% of participants reported at least some degree of attendance in religious or spiritual services (see Table 4).

**Descriptive Statistics**

The means, standard deviations, and alpha reliability coefficients for both predictor and outcome variables are presented in Table 5. All except two subscales had alpha reliability coefficients greater than .80, demonstrating an acceptable level of internal consistency (Field, 2013). The two subscales with lower reliability were the Connectedness subscale ($\alpha = .53$) of the Spiritual Transcendence Scale and the NR Perspective ($\alpha = .54$) of the Nature Relatedness Scale. These lower alpha reliability coefficients are consistent with findings from other studies and suggest either limited understanding of the concept or misinterpretation of scale items due to distinctive cultural context (Nisbet et al., 2009; Piedmont, 2004a, 2004b; Piedmont et al., 2009).

**Correlational Results**

Bivariate correlations were conducted to test hypotheses 1 through 3. Correlations between study variables are displayed in Table 6. First, it was hypothesized that connectedness to nature would be positively correlated with (a) resilience and (b)

psychological well-being. The hypothesis related to (a) was not supported due to the lack of a significant correlation between connectedness to nature and resilience. None of the measures of connectedness to nature, CNS or NRS, demonstrated statistical significance with resilience, *r* (163) = .11, and; *r* (163) =.10, respectively.

Table 5

*Overall Descriptive Statistics for Study Variables*

| Variable | *M* | *SD* | α |
|---|---|---|---|
| Global Religiousness Index (GRI) | 0 | 3.23 | .73 |
| Spiritual Transcendence Scale (STS) | 86.68 | 12.02 | .85 |
| Prayer Fulfillment | 28.54 | 6.14 | .78 |
| Universality | 34.93 | 5.46 | .82 |
| Connectedness | 23.35 | 3.44 | .53 |
| Sanctification of Nature Scale (SNS) | 107.70 | 29.01 | .96 |
| Perceived Sacred Qualities (PSQ) | 49.03 | 11.76 | .89 |
| Manifestation of God (MOG) | 58.67 | 20.02 | .98 |
| Nature Relatedness Scale (NRS) | 72.97 | 11.42 | .85 |
| NR Self | 31.12 | 5.63 | .80 |
| NR Perspective | 22.10 | 3.52 | .54 |
| NR Experience | 19.80 | 5.47 | .84 |
| Connectedness to Nature Scale (CNS) | 49.28 | 7.25 | .80 |
| Connor-Davidson Resiliency Scale (CD-RISC) | 98.44 | 13.49 | .93 |
| Scales of Psychological Well-being (SPWB) | 233.16 | 28.12 | .92 |
| Self-acceptance | 39.67 | 6.66 | .80 |
| Positive Relations with Others | 39.09 | 5.39 | .87 |
| Autonomy | 37.87 | 6.37 | .80 |
| Environmental Mastery | 37.72 | 5.81 | .90 |
| Purpose In Life | 37.74 | 4.77 | .91 |
| Personal Growth | 41.05 | 6.72 | .89 |

*Note: N* = 163

Table 6

*Intercorrelation Matrix*

| Measure | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|---|
| 1. Age | _ | | | | | | | | |
| 2. GRI | .22** | _ | | | | | | | |
| 3. CNS | .08 | -.06 | _ | | | | | | |
| 4. NRS | .10 | -.05 | .69** | _ | | | | | |
| 5. STS | .08 | .48*** | .28*** | .24** | _ | | | | |
| 6. SNS:PSQ | .09 | .43*** | .27*** | .26*** | .46*** | _ | | | |
| 7. SNS:MOG | .12 | .62*** | -.02 | -.07 | .51*** | .64*** | _ | | |
| 8. CD-RISC | .16* | .23** | .11 | .10 | .44*** | .26** | .33*** | _ | |
| 9. SPWB | .07 | .06 | .13 | .22** | .28*** | -.04 | .03 | .59*** | _ |

*Note*. *N*=163. 1 = Age, 2 = Global Religiousness Index, 3 = Connectedness to Nature Scale, 4 = Nature Relatedness Scale, 5 = Spiritual Transcendence Scale, 6 = Sanctification of Nature Scale: Perceived Sacred Qualities, 7 = Sanctification of Nature Scale: Manifestations of God, 8 = Connor – Davidson Resilience Scale, 9 = Scales of Psychological Well-being. * $p < .05$; p** <.01; *** $p < .001$.

However, the hypothesis related to (b) was partially supported; connectedness to nature when measured with the Nature Relatedness Scale was significantly correlated with psychological well-being, $r$ (163) = .22, $p < .01$. The correlation between connectedness to nature (when measured by the CNS) and psychological well-being, $r$ (163) = .13, did not reach statistical significance.

Secondly, it was hypothesized that connectedness to nature would be positively correlated with spiritual transcendence. This hypothesis was supported. Both measures of connectedness to nature, the CNS and NRS, were significantly related to spiritual transcendence, $r$ (163) = .28, $p < .001$, and; $r$ (163) = .24, $p < .01$, respectively.

Thirdly, connectedness to nature was hypothesized to be linked to sanctification of nature. Pearson's correlation analyses showed that only the PSQ sanctification subscale was significantly related to the two measures of connectedness to nature: $r$ (163) = .26, $p <.01$ (NRS), and $r$ (163) = .27, $p < .001$ (CNS).

Additional analyses revealed statistically significant positive relationships between spiritual transcendence and both outcome variables: resilience $r$ (163) = .44, $p < .001$, and psychological well-being $r$ (163) = .28, $p < .001$. In addition, resilience exhibited significant relationships with both sanctification subscales, $r$ (163) = .28, $p < .001$(PSQ), $r$ (163) = .33, $p < .001$ (MOG). Both spirituality measures, STS and SN were significantly correlated with each other $r$ (163) = .51, $p < .001$, as were both outcome measures, the CD-RISC and SPWB $r$ (161) = .59, $p < .001$. Furthermore, global religiousness showed strong correlations with both sanctification measures; $r$ (163) = .43, $p < .001$(PSQ), and $r$ (163) = .62, $p < .001$ (MOG). Moreover, global religiousness was moderately correlated with STS, $r$ (163) = .48, $p < .001$.

**Regression Results**

**Resilience Findings**. Hypothesis 4 indicated that Sanctification of Nature (SN) and Spiritual Transcendence (STS) would predict resilience above and beyond CN after controlling for significant covariates including demographic variables. Preliminary analyses revealed that age correlated with resilience, $r$ (163) = .16, $p$ = .040 and was therefore included in the regression model. Furthermore, since participant gender was not related to resilience, $t$ (161) = .19, it was not included in the regression analyses. In addition, the four global religiousness questions were transformed into $z$-scores and combined to form the Global Religiousness Index (GRI). The GRI revealed a statistically significant relationship with resilience $r$ (163) = .23, $p$ = .003; consequently, the GRI was included in the regression model.

A series of four hierarchical multiple regression analyses were performed to evaluate the unique contribution of two different forms of spirituality (measured by the STS and the SN) in the prediction of the criterion variable. In the first model, the demographic variables of age and global religiousness were entered in step one, both measures of connectedness to nature were entered in step two, and both measures of sanctification of nature were entered in step three, with resilience as the dependent variable. Table 7 summarizes the results of these analyses. Sanctification of Nature, contributed unique variance in the prediction of resilience beyond CN, age, and level of global religiousness, $\Delta R^2 = .06$, $F$ (6, 156) = 4.18, $p$ =.005. The same approach was carried out for the second regression analysis with the modification that SN replaced STS.

Table 7

*Hierarchical Regression Analysis Predicting Resilience from Demographic Variables, Connectedness to Nature, and Sanctification*

| Step and predictor variable | *B* | *SE B* | *β* | $R^2$ | $\Delta R^2$ |
|---|---|---|---|---|---|
| Step 1 | | | | .07 | .07* |
| Age | .45 | .32 | .11 | | |
| Global Religiousness | .09 | .48 | .02 | | |
| Step 2 | | | | .08 | .01 |
| Connectedness to Nature Scale | .12 | .19 | .06 | | |
| Nature Relatedness Scale | .08 | .12 | .06 | | |
| Step 3 | | | | .12 | .06** |
| Sanctification MOG | .21 | .08 | .31 | | |
| Sanctification PSQ | .01 | .12 | .01 | | |

*Note.* MOG = Manifestation of God Scale, PSQ = Perceived Sacred Qualities Scale; *N=163.*
* $p$ =.004; ** $p$ = .005

As presented in Table 8, after controlling for the effects of demographics and connectedness to nature, STS added unique variance in the prediction of resilience, $\Delta R^2$ = .14, $F$ (5, 157) = 8.56, $p < .001$.

Table 8

*Hierarchical Regression Analysis Predicting Resilience from Demographic Variables, Connectedness to Nature, and Spiritual Transcendence*

| Step and predictor variable | *B* | *SE B* | *β* | *R²* | *ΔR²* |
|---|---|---|---|---|---|
| Step 1 | | | | .07 | .07* |
| Age | .56 | .31 | .13 | | |
| Global Religiousness | -.07 | .42 | -.01 | | |
| Step 2 | | | | .08 | .01 |
| Connectedness to Nature Scale | -.03 | .19 | .02 | | |
| Nature Relatedness Scale | -.02 | .17 | -.08 | | |
| Step 3 | | | | .21 | .14** |
| Spiritual Transcendence | .50 | .10 | .45 | | |

*Note: N=163*. * $p = .004$; ** $p < .001$.

**Psychological well-being findings**. Two additional hierarchical regression analyses were performed to examine the role of spirituality in predicting well-being.

As seen in Table 9, the third regression model tested the hypothesis that SN would predict psychological well-being above and beyond CN after controlling for significant covariates including demographic variables. None of the demographic variables examined showed a significant relationship with psychological well-being and were therefore excluded from the regression model. However, global religiousness was included as a control variable in all regression analyses to differentiate it from the other

Table 9

*Hierarchical Regression Analysis Predicting Psychological Well-being from Global Religiousness, Connectedness to Nature, and Sanctification*

| Step and predictor variable | *B* | *SE B* | $\beta$ | $R^2$ | $\Delta R^2$ |
|---|---|---|---|---|---|
| Step 1 | | | | .00 | .00 |
| Global Religiousness | .75 | 1.00 | .07 | | |
| Step 2 | | | | .05 | .05* |
| Connectedness to Nature Scale | .00 | .41 | .00 | | |
| Nature Relatedness Scale | .75 | .27 | .30 | | |
| Step 3 | | | | .09 | .03** |
| Sanctification MOG | .25 | .17 | .18 | | |
| Sanctification PSQ | -.63 | .26 | -.27 | | |

*Note:* MOG = Manifestation of God Scale, PSQ = Perceived Sacred Qualities Scale; *N=163*.
* $p = .016$; ** $p = .057$

spirituality measures. Therefore, global religiousness was entered in step one of the regression model, both measures of connectedness to nature were entered in step two, and both indices of SN were entered in step three, while psychological well-being served as the dependent variable for the regression model. After controlling for the effects of GRI and connectedness to nature, it was found that when entered together in step 3, measures of SN added unique variance in the prediction of psychological well-being, $\Delta R^2 = .03$, $F$ (5, 157) = 3.00, $p = .057$.

The same approach was used for the fourth regression analysis with the modification that SN was replaced with STS. As shown in Table 10, the analyses revealed that STS contributed unique variance in the prediction of psychological well-being beyond CN and global religiousness, $\Delta R^2 = .06$, $F$ (4. 158) = 4.89, $p$ = 002.

Table 10

*Hierarchical Regression Analysis Predicting Psychological Well-being from Global Religiousness, Connectedness to Nature, and Spiritual Transcendence*

| Step and predictor variable | *B* | *SE B* | *β* | $R^2$ | $\Delta R^2$ |
|---|---|---|---|---|---|
| Step 1 | | | | .00 | .00 |
| Global Religiousness | -.82 | .90 | -.08 | | |
| Step 2 | | | | .05 | .05* |
| Connectedness to Nature Scale | -.40 | .41 | -.10 | | |
| Nature Relatedness Scale | .53 | .26 | .28 | | |
| Step 3 | | | | .11 | .06** |
| Spiritual Transcendence | .68 | .21 | .29 | | |

*Note: N=163*.
* $p = .016$; ** $p = .002$

**Mediation Results**

Mediation hypotheses were that spirituality would act as a partial mediator between connectedness to nature (CN) and resilience and between CN and psychological well-being. According to Baron and Kenny's (1986) mediation model, the independent variable (IV), the dependent variable (DV), and potential mediator all need to show significant correlations. Due to the lack of significant correlational findings involving some of these variables (see Table 6), mediational analyses were limited to hypothesis 6d which stated that spiritual transcendence would act as a partial mediator between

connectedness to nature and psychological well-being. As Figure 2 illustrates, the standardized regression coefficient between connectedness to nature and psychological well-being was statistically significant, as were the standardized regression coefficients between connectedness to nature and spiritual transcendence and between spiritual transcendence and psychological well-being. Three separate regression equations were calculated (see Table 11). In Step 1 of the mediation model, the regression of STS on CN, was significant, $\beta = .24$, $t\ (161) = 3.1$, $p = .002$. Step 2 showed that the regression of psychological well-being on CN was also significant, $\beta = .22$, $t\ (161) = 2.86$, $p = .005$. In step 3 of the analysis psychological well-being was regressed on both CN and the mediator variable, STS. When CN and spirituality were both used to predict psychological well-being, the relationship between CN and psychological well-being was significantly weakened. Specifically, analyses revealed that, when the mediator STS was controlled for, connectedness to nature was still a significant predictor of psychological well-being, $\beta = .16$, $t\ (160) = 2.11$, $p = .037$. However, the relationship between CN and psychological well-being was significantly reduced when the mediator, STS, was controlled for in the equation. Partial mediation was indicated as the effect of CN on psychological well-being was less in the third equation (B =.16) than in the second (B =.22) as indicated by the standardized beta coefficient. A Sobel test was conducted and confirmed the partial mediation in the model ($z = 2.21$, $p = .027$). These analyses provide support for the role of STS as a partial mediator of CN's effect on psychological well-being.

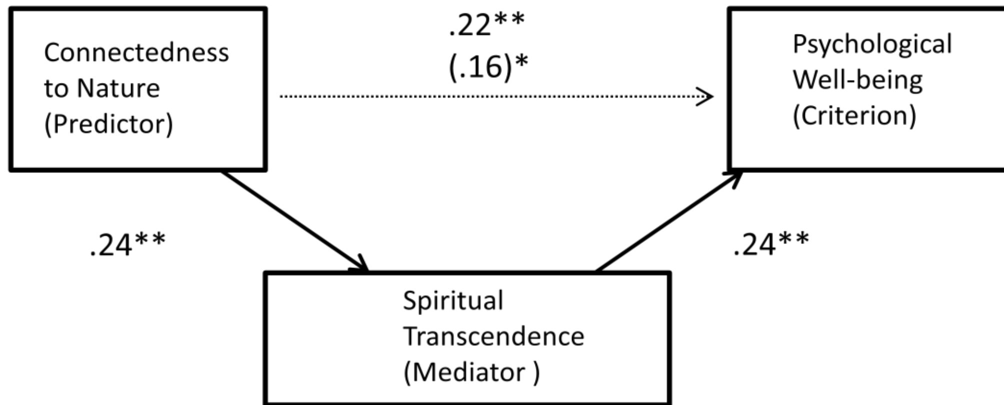


*Figure 2*. Standardized regression coefficients for the relationship between connectedness to nature and psychological well-being as mediated by spiritual transcendence. Connectedness to nature measured by the Nature Relatedness Scale.
*$p$ < .05. **$p$ < .01.

Table 11

*Spiritual Transcendence as Mediator Variable between CN and Psychological Well-being*

| Independent Variable | Mediator Variable | Dependent Variable |
|---|---|---|
| | | Psychological Well-being |
| Connectedness to Nature | Spiritual Transcendence | 1. $R^2 = .06$; $\beta = .24$** |
| | | 2. $R^2 = .05$; $\beta = .22$** |
| | | 3. $R^2 = .10$; $\beta = .16$** |
| | | $\Delta\ \beta = -.06$; $Z = 2.21$* |

*Note:* Equation 1: Mediator regressed on independent variable; Equation 2: Dependent variable regressed on independent variable; Equation 3: Dependent variable regressed on independent variable and mediator; $\Delta\ \beta$ change in standardized beta from Equation 2 to 3; $Z$ = Sobel test to examine if mediator effect is significantly different from zero; $N = 163$. ** $p < .01$; * $p < .05$

# CHAPTER V

## Discussion

John Muir once said, “Everybody needs beauty as well as bread, places to play in and pray in, where nature may heal and give strength to body and soul alike” (Muir, 1912, p. 256). Does research support Muir’s belief that nature has the power to heal one’s soul? This study attempted to support the theory that nature has the ability to help people develop buoyancy; and consequently maintain or improve their mental health. In accordance with Muir’s belief, this quantitative study has provided new insight into the important role of nature in people’s lives. Hence, this study explored of the role of connectedness to nature and spirituality in predicting well-being and resilience. The findings presented empirical evidence to advance understanding of the construct of connectedness to nature and its contribution to well-being.

A discussion of the six hypotheses is presented here by considering the findings related to (a) connectedness to nature and well-being, (b) connectedness to nature and spirituality, (c) connectedness to nature, spirituality, and well-being, and (d) mediational results. Furthermore, this chapter offers a discussion of the study’s contributions to the field of psychology, along with possible implications for the mental health field. The chapter concludes with a brief discussion of the limitations of the study and recommendations for future research.

### Summary of Findings

**Connectedness to nature and well-being. .** Results showed a positive correlation between connectedness to nature and psychological well-being; a finding that is

supported by several recent studies (Howell et al., 2011; Mayer et al., 2009; Nisbet et al., 2010). More specifically, the current findings support previous research that connectedness to nature has a significant influence on numerous aspects of mental health such as personal growth and overall quality of life (Hartig et al., 2003; Louv, 2005). The connection between nature and well-being found in the current study relates to Hartig's (2003) findings which highlight nature's restorative qualities as a powerful resource to decrease stress and restore life balance.

In addition, it is important to note that connectedness to nature was positively correlated with psychological well-being only when measured by the Nature Relatedness Scale (NRS), not the Connectedness to Nature Scale (CNS). CNS measures cognitive attitudes rather than emotional connectedness (Perrin & Benassi, 2009), which has been noted as a limitation of the CNS. Another noteworthy limitation is that the CNS does not include a physical component of connectedness to nature. Nisbet et al. (2010) insisted that such a physical component is crucial in determining an operational definition of connectedness to nature. For example, the CNS included survey items such as: "I feel a kinship with animals," or "I feel part of the web of life." Whereas the NRS worded items as: "I enjoy being outdoors," or "My ideal vacation spot would be a remote wilderness area." This physical component of the NRS made the survey items tangible and concrete which corresponds to Perrin and Benassi's (2009) suggestions of creating an effective measure of emotional connection to nature. In several previous studies, the NRS has been verified as a suitable measure of connectedness to nature with undergraduate students (Creedon, 2013; Nisbet et al., 2009; Tauber, 2012). Consequently, the NRS was a fitting

addition to the measurement of connectedness to nature for this research. No previous studies of connectedness to nature have used the NRS and CNS together. Future research could compare the effectiveness of both scales.

Furthermore, the results from this study revealed that connectedness to nature was associated with psychological well-being but not associated with resilience. This finding was somewhat unexpected due to the prior studies that found positive correlations between connectedness to nature and resilience (Ingulli & Lindbloom, 2013; Neill & Dias, 2001; Wells & Evans, 2003). Previous research, however, used a fundamentally different sample population which consisted of children, young adolescents, or adults associated with outdoor organizations; not undergraduate student. Furthermore, prior samples included participants who experienced challenging life events such as family relocation, bullying, poverty, and violence (Wells & Evans, 2003). Additionally, the two landmark studies of the relationship between nature and resilience used experimental education components where participants encountered challenges while being outdoors (Neill & Dias, 2001; Ungar et al., 2005).

A possible explanation for the absence of significant results may be related to the low-risk nature of the sample. It is possible that in the general population, the triumph over adverse life events such as mental illness or loss is associated with resilience (Greeff & Loubser, 2008; Rutter, 1985). The present study did not assess whether participants previously encountered such adverse events. Luthar, Cicchetti and Becker (2000) pointed out that within the literature the experience of an adverse event is seen as a critical condition to evaluate resilience. Limited encounters of adversity may have impacted the

participants' relationship between connectedness to nature and resilience. Consequently, further studies comparing resiliency in college students in privileged areas with college students in hardship areas (e.g. community violence and poverty) can prove to be beneficial. These comparisons can lead to a more enhanced and comprehensive understanding of the characteristics of privileged college students' resiliency. Overall, the participants' difference in age, stage-of-life, and lack of adversity may have contributed to this study's non- significant association between connectedness to nature and resilience.

It is also plausible that the way in which resilience was conceptualized in this study may not have fully captured coping with stressful situations. Luthar and Cicchetti (2000) noted that the meaning of a particular adverse event to the individual experiencing it can differ substantially from that of the resilience researcher. Moreover, recent resiliency scholars have proposed moving away from the trait model to a new way of conceptualizing resilience, namely resilience-as-process. That is, individuals who demonstrate higher levels of resilience also exhibit ongoing adaptation to life's daily stressors (Montepetit, Bergeman, Deboeck, Tiberio & Boker, 2010). When considering resilience from a dynamical system approach, it is possible that participants in the current study have not yet developed a method of adaptive functioning.

Likewise, reflecting on one's connection to nature may not correspond to resilience as accurately as concrete nature experiences. According to Ungar et al. (2005) experiential learning programs in nature are associated with resilience because challenges demand immediate responses. For example, if it rains and a shelter has been built,

individuals experience instant reward and a sense of accomplishment. Thus, an actual outdoor experience tends to generate an association with resilience.

In addition, it is important to note that recent studies have demonstrated instabilities with the CD-RISC (Burns & Anstey, 2010; Campbell-Sills & Stein, 2007). A modification of this scale has included aspect of resilience such as social support in hopes of a more comprehensive version of the CD-RISC. Furthermore, the modified CD-RISC utilizes first person verbiage to initiate a sense of personal applicability of the scale items (Dong, Nelson, Shah-Haque, Khan & Ablah, 2013). Consequently, the modified scale “achieved a stable factor structure and high internal consistency, and generated a more interpretable result than the original CD-RISC” (p. 20). Even though the current study demonstrated high internal consistency with the original CD-RISC, the newly included facets of resilience in the modified version may impact the relationship between connectedness to nature and resilience.

This particular sample of undergraduate students, most of who resided in suburban or urban (88%) environments, did not report a substantial level of affect of being connected to nature. Even though connectedness to nature was significantly correlated with psychological well-being, the correlation was relatively weak. Given that connectedness to nature had a low impact on this population sample in general, these students may have related better to the construct of psychological well-being in relation to being in nature. For instance, resilience was measured by the Connor-Davidson Resilience Scale (CD-RISC), which included phrases such as stress, pressure, challenges, problem solving, and hardship (Connor & Davison, 2003). In contrast to the CD-RISC,

the Scales of Psychological Well-being, (SPWB; Ryff, 1995) inquire about topics such as self-acceptance, personal growth, and autonomy which may have been easier for these undergraduates to associate with than being in nature. Human development researchers have confirmed the unique inclination of emerging adults to focus on self, explore identity, and seek out self-sufficiency (Arnett & Tanner, 2006).

**Connectedness to nature & spirituality.** In the present study, spirituality was defined and measured as sanctification and spiritual transcendence. Corresponding to preceding literature, the findings of this study showed that connectedness to nature is associated with greater spiritual transcendence and sanctification of nature. Prior studies highlighted the substantial relationship between encounters in nature and consequent intense emotions such as feelings of personal insignificance and humility when confronted with the enormity of nature (Davis et al., 1991; Stringer & McAvoy, 1992; Williams & Harvey, 2001). Specifically, this study supports previous transcendence research in suggesting that experiences in natural places promote a transcendent feeling of "standing outside of one's immediate sense of time and place to view life from a larger, more objective perspective (Piedmont, 1999, p. 988). These findings are consistent with the larger body of research showing a significant relationship between transcendence and experiences in nature (Davis et al., 1991; Marsh, 2008; Williams & Harvey, 2001). Although the results of the study support Piedmont's spiritual transcendence theory, there are limitations with the connectedness subscale. In accordance with various research (Joshanloo, 2012; Piedmont, 2001; Piedmont, Werdel & Fernando, 2009), this subscale shows continually poor internal consistency suggesting

not all items, on the connectedness subscale, are measuring the same underlying construct in the same way. Future research may want to explore possible revisions to the connectedness subscale of the STS.

Numerous studies have examined the multifaceted relationship between spirituality and well-being. The current study's findings offer support for the notion that spirituality has a positive impact on psychological well-being (Plante & Thoresen, 2007; Richard & Bergin, 2005). Findings revealed significant positive relationships between STS and both well-being measures. In addition, resilience exhibited significant relationships with both sanctification subscales. These findings offer important implication for mental health professionals. Counselors should consider that including a client's spirituality into treatment could increase that person's psychological well-being and foster resiliency. It is important to note that sanctification of nature showed no significant correlation with psychological well-being. To this date, no previous studies have examined the direct link between sanctification and psychological well-being. Rather, sanctification has repeatedly shown to correlate with personal investment of time and resources. Individuals who sanctity the environment, parenting, marriage, or the body tend to place a higher priority on the care and protection of these sacred aspects (Mahoney, et al., 2003; Mahoney, Carels, et al., 2005; Murray-Swank, Mahoney, & Pargament, 2006; Tarakeshwar et al, 2001). The lack of significant findings between sanctification of nature and psychological well-being is somewhat unexpected since Mahoney, Pargament et al. (2005) established that sanctification of personal strivings (i.e. daily goals) was related to psychological benefits such as joy, happiness and meaning.

This lack of correspondence may be due, in part, to the different sample. Whereas Mahoney, Pargament's study was conducted with a community sample of adults age 25 to 55, this study used predominately undergraduate students. Furthermore, Mahoney et al. (2003) have mentioned the potential of a negative aspect of sanctification. Greater sanctification of an aspect of life could be associated with greater intolerance and greater sense of loss. Individuals may suffer greatly when a sacred object is lost or being destroyed. Environmental degradation has consistently been highlighted in popular media. This sense of current destruction and impending loss may have influenced the relationship between sanctification of nature and psychological well-being in this case. Correspondingly, Clinebell (1996) has previously highlighted the relationship between environmental degradation and mental health problems.

In general, the results of this study reveal new implications for sanctification research. This study represents the first research on sanctification of nature by means of the Sanctification of Nature scale. The current study improved the understanding of people's conceptualization of nature, namely through perceiving nature as sacred. Therefore, the study's findings are of great consequence to mental health professionals, indicating that people's spirituality and nature are interconnected. Furthermore, this study demonstrates the relevance of sanctification of nature research within the domain of psychological well-being. The current results support previous research conducted by Mahoney et al. (1999) and Swank et al. (1999) which suggests that the sacredness of human pursuits such as marriage and sexuality can lead to greater mental health. For

clinicians, the significant relationship between connectedness to nature and well-being highlights a new form of therapeutic interventions.

The sample offered some interesting findings in regard to the two sanctification subscales. Correlation between connectedness to nature and sanctification of nature was only present when sanctification was measured with the Perceived Sacred Qualities (PSQ) subscale. Participants may have differentiated between the two subscales because the Manifestations of God (MOG) subscale is phrased in terms that favor a monotheistic view of spirituality such as “Nature is a temple of God,” “God is present in nature,” and “Nature is an instrument of God”. Conceptually, it is important to note that the demographic data of this study are consistent with the larger trend of college students who classify as spiritual rather than religious when asked about global religiousness (Overstreet, 2013). Recent research supports this trend which indicates that individuals are making a clear distinction between religion and spirituality and consequently aligning with spirituality (Fleming, Overstreet, & Chappe, 2006). College students’ disengagement from religious affiliation and practices parallels the work of Bryant, Choi, and Yasuno (2003). Therefore, this study along with previous literature proposes that mental health professionals assess, manage, and treat young adults with an emphasis on spiritual exploration and development apart from the traditional understanding of religion. Consequently, participants might have had difficult relating to the monotheistically phrased MOG subscale. Suggestions for future sanctification research with young adults may include a revision of the MOG subscale reflecting a more spiritually inclusive verbiage.

**Connectedness to nature, spirituality, and well-being.** While most studies in this area have tended to focus on the relationship between connection with nature and psychological well-being (Howell et al., 2011; Mayer et al., 2009), this study included spirituality as a way of further understanding how people think about and experience nature in relation to their spirituality and overall well-being. This study extends existing research in this area by including the two spirituality measures of spiritual transcendence and sanctification of nature that directly assess aspects of spiritual experiences in relation to well-being. Both spirituality measures predicted well-being variables over and above connectedness to nature. Additionally, the result of the regression analyses revealed that connectedness to nature was predictive of psychological well-being until spirituality was entered into the regression model. Consistent with hypotheses, spirituality (both spiritual transcendence and sanctification of nature) added unique variance in the prediction of resilience and psychological well-being after taking connectedness to nature into consideration.

Since no previous research has looked at connectedness to nature, spiritual transcendence, sanctification of nature, and psychological well-being variables together, this method of analysis is novel in the literature. Thus, it is difficult to compare this finding to any previous research. It can be noted, however, that spiritual transcendence and sanctification are crucial ingredients for psychological well-being, above and beyond connectedness to nature. These findings build on the work of Harrison et al. (2001), Plante et al. (2001), and Plante and Thoresen (2007), who highlight the importance of spirituality in relation to positive mental health.

**Mediational findings.** A principal feature of this particular study is the unique role of spiritual transcendence as a partial mediator between connectedness to nature and psychological well-being. As a result, these findings offer support of Piedmont's (1999) assumption that transcendence may be the underlying foundation of human strivings. Furthermore, spiritual transcendence as a mediator presents additional empirical evidence for the unique contribution of spiritual transcendence to well-being (Ahrens et al., 2010; Piedmont & Leach, 2002). These findings suggested that connectedness to nature is associated with psychological well-being via the pathway of spiritual transcendence. This is the first study to demonstrate the role of spiritual transcendence as a mediator between connectedness to nature and psychological well-being. Future research would be valuable in further understanding the interaction between connectedness to nature, spiritual transcendence and well-being.

The findings from this study helped facilitate greater understanding of the dynamic role of spirituality in regard to connectedness to nature and psychological well-being. Mediation results suggest that connectedness to nature affects spiritual transcendence which in turn affects psychological well-being. It may well be that being connected to nature can initiate an experience of spiritual transcendence and as a result facilitate greater psychological well-being. Given that no studies to date have investigated spiritual transcendence as a mediator in this way, there is a lack of comparable results. Perhaps the most convincing support to the notion that spiritual transcendence may be a factor that explains the relationship between connectedness to nature and well-being is that spirituality has consistently shown a strong association with both variables: nature

and well-being (Greeff & Loubser, 2008; Lee et al., 2012; Raftopoulos & Bates, 2011; Van Dierendonck, 2012).

At the same time, it should be noted that only one of the four hypothesized mediator relationships was found to be significant. Mediation hypotheses were that both spirituality measures would act as partial mediators between connectedness to nature (CN) and resilience and between CN and psychological well-being. The lack of a significant relationship between CN and resilience eliminated two mediator analyses. Possible explanations for the absence of significant results between CN and resilience are discussed, in detail, early in the chapter. Furthermore, the lack of a significant relationship between sanctification of nature and psychological well-being eliminated another mediator analysis. The lack of association between these variables is somewhat unexpected and is further discussed early in the chapter. The implications of finding only one significant mediator relationship point to the preciseness of the mechanism that underlies the relationship between connectedness to nature and psychological well-being. Consequently, current results suggested that only spiritual transcendence serves as the intervening variable between connectedness to nature and psychological well-being.

In summary, most hypotheses were confirmed and in accordance with previous literature. Therefore, this study and preceding literature point towards nature’s strong affiliation with psychological well-being and with spirituality. In other words, an increase in connection to nature has the potential to correspond with an increase in psychological well-being in addition to nurturing one’s spirituality. Predominantly, this study demonstrated the substantial role of spirituality in the relationship between connectedness

to nature and psychological well-being. Moreover, the mediational findings that spiritual transcendence acted as a significant mediator between connectedness to nature and psychological well-being has indicated that individuals who are connected to nature are more likely to experience spiritual transcendence which in turn is linked to greater psychological well-being. Therefore, exploring people's connection with the natural world is crucial for all mental health care providers because this connection is intimately related to the psychological and spiritual health of individuals, societies, and the planet as a whole. These results support previous studies which explored the links between connectedness to nature and psychological well-being, connectedness to nature and spirituality, and psychological well-being and spirituality (Besthorn, 2005; Bobilya et al., 2009; Harrison et al., 2001).

## Contribution to Counseling Psychology

One of the goals of this study was to bring awareness to the relationship people experience with nature and consequently to recognize the therapeutic potential of the outdoors. This study contributed to the field of counseling by (a) confirming the mental health value of a deep connection to nature, (b) confirming the spiritual value of a deep connection to nature, (c) elucidating the role of spirituality in the relationship between well-being and connectedness to nature, and (d) adapting the Sanctification scale (Mahoney et al., 2005) to form the Sanctification of Nature Scale. The next section describes each contribution briefly.

**Mental health value of connection to nature.** The results of this study support the work of renowned environmentalists from the past such as Muir (1911) and Thoreau

(1893), alongside abundant research that highlighted the powerful bond between mental health and connection to nature (Clinebell, 1996; Louv, 2005; Mayer et al., 2009; Mayer & Frantz, 2004). Current findings have supported the notion that people's connection with the natural world has the potential to contribute meaningfully to the work of mental health care providers. As this type of research grows in volume, it is likely to draw additional scholastic attention resulting in possible academic training programs centered on the integration of nature into the counseling process. In other words, if research supports the mental health benefits of connecting with nature, counselors will be more inclined to utilize nature as a therapeutic resource. As this study showed, people's well-being is impacted by their connection to nature; therefore it is sensible to include an ecological component into various clients' treatment plans. Furthermore, the mental health and nature bond hints at the possibility that counselors who guide their clients to strengthen this bond would encourage them to experience *nurture by nature*. Contrary to nature's mental health benefits are the threats of eco-alienation which underscore the negative effects of disconnection from nature. Thus, a deep connection to nature is advantageous to people's well-being and therefore necessitates the attention of all mental health professionals.

**Spiritual value of connection to nature**. In the midst of the horrors of the Nazi regime, Anne Frank (1995) wrote these words in her journal:

> The best remedy for those who are frightened, lonely or unhappy is to go outside, somewhere they can be alone, alone with the sky, nature and God. For then and

> only then can you feel that everything is as it should be and that God wants people to be happy amid nature's beauty and simplicity. (p. 196)

Findings from this study have endorsed the notion that nature has the ability to facilitate deep spiritual encounters which are an inherent part of the human experiences. Also, past research has indicated a substantial connection between spirituality and mental health (Loewenthal, 1995; Pargament, 1997; Pargament et al., 1998). Therefore, mental health professionals, especially pastoral counselors, can enhance their therapeutic effectiveness by encouraging clients to immerse in nature; this has the potential to foster spiritual development and in turn mental health (Harrison et al., 2001; Stringer & McAvoy, 1992). Thus, it may be beneficial if counselors attend to their clients in a holistic, integrative manner by including topics of spiritual and environmental nature into the counseling process. The association between connection to nature and spirituality has been given little attention by researchers. The current study provides modest support by expanding awareness of the comprehensive potential of a nature connection.

***Spirituality's role in the nature/well-being relationship.*** The current study was a unique examination of the complex interactions among the variables of connectedness to nature, psychological well-being, and spirituality. Although this study is of an exploratory nature, these findings offered support for the notion that spiritual experiences in nature, not simply one's connection to nature, provide mental health benefits. Therefore, one's spiritual experience can be regarded as the key element in the relationship between well-being and connectedness to nature. This finding indicates that spirituality has a distinct relationship with connectedness to nature in regard to well-

being. In particular, this study further supported the notion that spiritual transcendence is partly responsible for the link between connectedness to nature and psychological well-being. This finding raises the following questions: Are mental health benefits from encounters in nature likely due to nature itself being perceived as a spiritual entity? Is it possible that nature does not simply facilitate spiritual experiences but nature itself is spiritual? Such ponderings may motivate researchers to shift the literature from a more limited look at health benefits of nature to a more holistic view of nature and its dynamic relationship with spirituality.

***Sanctification of nature scale***. Finally, another contribution of this study is the adaptation of the Sanctification scale (Mahoney et al., 2005) to form the Sanctification of Nature scale. Two scales were adapted to assess the construct of sanctification of nature. The first measure, labeled the Perceived Sacred Qualities of Nature Scale, was designed to assess how much individuals perceived nature as having divine qualities. The second measure, labeled Manifestation of God Scale, was adapted to assess the degree to which people perceived nature to be a manifestation of God. This adaptation has offered a considerable advance of sanctification research into a new domain of psychosocial research: nature. The Sanctification of Nature adaptation highlighted the relevance of this construct by demonstrating strong psychometric properties including robust alpha reliability. The Sanctification of Nature Scale exhibited strong incremental validity in this study in the prediction of levels of well-being after controlling for demographics, global religiousness, and connectedness to nature. These strong psychometric properties provide

further empirical confirmation of the relevance of sanctification of human pursuits and experiences.

On average, students described nature as having sacred qualities (e.g., “divine, awesome”) and expressed that nature embodies God (e.g., “God lives through nature”). This outcome has provided evidence that students frequently view nature as having a spiritual dimension. Previous research has also demonstrated that, in general, people believe that nature is sacred (Tarakeshwar et al., 2001). Consequently, these results suggest that this construct can provide a valuable empirical tool for examining the relationship between spirituality and well-being. This study expanded on earlier sanctification research that investigated the relationship between sanctification of nature and environmental activism (Tarakeshwar et al., 2001), offering evidence of sanctification’s influence on behaviors and attitudes. These results suggest that sanctification of nature is likely to become a significant construct of future psycho-social research.

## Limitations of the Study

This study has several limitations that need to be considered when generalizing the findings. The following summary provides a discussion of these limitations.

**Sampling limitation.** The sample of the current research study included undergraduate students from a mid-size public university in Maryland which lacked diversity in several areas: race, gender, and living environments. The majority of participants were female, White, and living in suburban environments. Furthermore, the majority of participants identified with one of the major theistic religions or classified as

not religious. Individuals with diverse backgrounds and religious beliefs can be an important factor in understanding the relationship between connectedness to nature, spirituality, and psychological well-being. Furthermore, the inclusion of individuals of various age groups would have created a more representative sample. The college age group may differ considerably from more mature ages in their relationship to nature. It is possible that individuals need to develop in their appreciation of nature. According to Arnett (2000), emerging adulthood is a time of exploration, seeking, and discovery. For example, emerging adults spend more time and energy exploring multiple beliefs and worldviews then at any other time in their lives. An individual's connection to nature, at this time of identity exploration, may have not fully developed. Therefore, the exclusion of different age groups has limited the scope of these research findings.

Lastly, the current study's sample population was obtained from a single geographic location: a mid-size urban area in Maryland. Due to the content of this study, it may have been beneficial to include participants from rural areas. Klassen's (2010) research on rural versus urban residents found that youth living in rural settings reported a stronger connection to nature than youth residing in urban environments. Moreover, this study was restricted to the U.S. which eliminated the comparison of nature connectedness with other countries. Is it possible that other countries report a deeper or lesser affiliation with nature? Gregoire (2013) reported that Germans, for example, have a deep-seated affiliation with nature.

**Measurement limitations**. Construct validity was addressed by choosing measures that have shown a history of reliability, validity, and use in previous research.

While the CD-RISC and SPWB have demonstrated strong internal and external validity and have been extensively utilized in the literature, less scholarly usage is associated with the CNS and NR scales. The use of both connectedness to nature scales has been limited to a small number of studies and narrow sample populations (Frantz, Mayer, Norton, & Rock, 2005; Mayer & Frantz, 2004; Nisbet et al., 2010; Nisbet & Zelenski, 2011). The NR-self's lower alpha reliability coefficient is consistent with other findings (Nisbet et al., 2009) and suggests either limited understanding of the concept or misinterpretation of scale items due to a distinctive cultural context. Perrin and Benassi (2009) pointed out that the CNS limitation involves its inability to assess emotional connectedness as well as the lack of a physical component of connectedness to nature. Nisbet et al. (2010) insisted that such a physical component is crucial in determining an operational definition of connectedness to nature.

In regard to the STS, the Connectedness subscales showed lower reliability; this lower alpha reliability coefficient has been consistent throughout previous research (Piedmont, 1999; Piedmont, 2001; Piedmont, 2004a) and suggests either limited understanding of the concept or misinterpretation of scale items due to a distinctive cultural context. Furthermore, the use of self-report inventories has inherent restrictions such as social desirability, bias, or agreement acquiescence (the tendency to agree with all types of items). For this study, undergraduate students received extra credit for participation. It is unknown how this incentive impacted the responses given; however it may have invited students to hurry through the surveys without reflecting on the survey items. This may have been evident in the current study as a large number of participants

did not complete the majority of study questions or skipped over questions. Furthermore, self-report inventories can contain language that is abstract, ambiguous, or limiting. As seen in the current study, respondents took the initiative to express their opinions when asked about global religiousness with statements such as “No statement applies but I am a child of the universe” or “I am a spiritual seeker.” Consequently, the inclusion of additional identification choices could expand the understanding of participants’ beliefs regarding religious affiliation. The results indicated 46.1% of participants chose to identify as “None” or “Other” (“Other” included Agnostic, Atheist, Pantheist, and Deism) when inquiring about religiously affiliation.

**Limitations of correlational research.** This research study investigated the nature of the relationship among connectedness to nature, spirituality, and psychological well-being. This study showed, in part, that these variables significantly correlate with each other, but it does not allow for causal inference. This study’s correlational design is foundational in nature in terms of developing a theoretical model involving the variables of interest and in turn provides the basis for future experimental research studies.

## Directions for Future Research

Temperatures are rising; air and water pollution is worsening. Glaciers are melting and sea levels are increasing. Environmental degradation is a topic of constant discussion and has recently given rise to the “greening” of our society as people are making more eco-conscious choices. This study, among others, has demonstrated the importance of nature in the well-being of individuals. Correspondingly, Clinebell (1996) proposed an intrinsic link between the increase in environmental degradation and societal

increase in mental health problems. Therefore, it would be useful for future research to take an in-depth look at the relationship between environmental degradation and mental illness, as well as between ecological efforts to improve the environment and psychological well-being.

On a similar note, government officials recent focus on reforms of the nationwide health care system. The investigation of preventative health care methods, such as wellness promoting behaviors has sparked the interest of the health care field (Maciosek, Coffield, Flottemesch, Edwards & Solberg, 2010). As this study suggests, connecting with nature can promote wellness. Therefore, it would be useful to examine in more detail the role of connection with nature in mental and physical health, especially on a long term basis. Is it possible that people who regularly engage with nature enjoy long term health benefits? Longitudinal research may help establish the value of connection with nature as a preventative health care approach.

It may also prove fruitful to investigate the construct of connectedness to nature through qualitative or experimental research design. An individual’s relationship with nature is complex and warrants an in-depth analysis of the actual experience. A quantitative investigation of this construct is limited by the rigidity of definable variables. Ideally, future studies could apply mixed method research to gain a more comprehensive understanding of connectedness to nature. Furthermore, future experimental research would promote drawing causal conclusions between connectedness to nature and other relevant variables. In addition, adding an actual outdoor experimental condition may promote greater comprehension of this construct. The sentiment of feeling connected to

nature is impossible to manipulate; however, exposure to the outdoors and consequent reaction or sensations may yield findings of significance.

Given that the sample population was insufficiently diverse, future research should include a wider range of racial, socioeconomic, and faith backgrounds to see how connectedness to nature is perceived within various populations. Strife and Downey (2009) pointed out that poor and minority youth are less likely to spend time engaging with nature. In some way, outdoor pursuits such as hiking are associated with certain economic standings, therefore attracting individuals of specific racial and economic backgrounds. It is certain that environmental inequality impacts one's connection to nature; however, future research could investigate on the nature of such an impact. Furthermore, research should generate scholastic interest in the effectiveness of programs such as Outward Bound or Blue Sky Fund who provide outdoor experiences to urban at-risk-youth. On a related note, it would be interesting to examine what stage of Maslow's (1943) hierarchy of needs links up with nature-connection. Is it likely that one must satisfy the lower levels of basic needs before nature involvement becomes effective? Or is nature such an instinctual ingredient of the human experience that it is part of biological and physical needs?

Equally important to the human-nature connection is the relationship between humans and spirit. Seventy-five percent of participants reported religious affiliation, this parallels the data found in 2001 by the Higher Education Research Institute which reports 84.2 % of college freshman indicating religious affiliation (Sax, Lindholm, Astin, Korn, & Mahoney, 2001). It seems that in general, the U.S. college population is more

religiously inclined than in other countries. For example, 50% of Americans have deemed religion as very important whereas only 17% of individuals in Britain are in agreement with that statement (Pew Research Center, 2011). Even though religiousness in the U.S is considerably high, the attention of popular media has recently been captured by the widespread tendency of young Americans to identify as spiritual rather than religious. The present study has affirmed this trend. Future studies may want to investigate this inclination which indicates that individuals are making a clear distinction between religion and spirituality and consequently aligning with spirituality. Overstreet (2013) suggested that there is a "deep desire among students, no matter what their self-understanding of being religious and/or spiritual, to search for the transcendent and live lives directed toward the common good" (p. 260). Therefore, future research may help mental health professionals assess, manage, and treat young adults with an emphasis on spiritual exploration and development apart from the traditional understanding of religion.

This study joins previous literature in highlighting the benefits of engaging in nature. The sensible next step for mental health professionals may be to incorporate nature experiences into therapy. Unfortunately, there is an inadequate amount of research looking at practical effects of using nature in therapy. Berger and McLeod (2006) proposed that nature therapy can advance traditional therapy by introducing clients to nature as a therapeutic setting, nature as a facilitator of rituals, and nature as a means to reconnect body, spirit, and mind. At present, very few studies have investigated these

proposed nature therapy interventions. Therefore, future research is essential in verifying the effectiveness of using nature as an ally in therapy.

## Conclusion

This study investigated the interconnectedness of three constructs: connectedness to nature, spirituality, and well-being. Specifically, this study examined the relationship between connectivity to nature and psychological well-being. Consequent to the findings, this study is able to offer empirical support to the theory that nature has the ability to positively affect one's mental health. Results showed that connectedness to nature was associated with psychological well-being but not associated with resilience. In line with preceding literature, further findings of this study suggest that connectedness to nature is associated with greater spiritual transcendence and sanctification of nature. Additionally, this study suggests that an individual's spiritual experience can be regarded as a powerful element in the relationship between well-being and connectedness to nature. Moreover, this study established spirituality (spiritual transcendence) as a partial mediator in the relationship between connectedness to nature and psychological well-being. Taken as a whole, this study highlighted the healing potential of nature and raises interest in using nature in therapeutic settings. Emphasis on the benefits of connection to nature could lead to interventions designed to increase such connection, which in turn may contribute to increases in psychological well-being, resulting in overall enhancement of quality of life.

**REFERENCES**

Ahrens, C. E., Abeling, S., Ahmad, S., & Hinman, J. (2010). Spirituality and well-being: The relationship between religious coping and recovery from sexual assault. *Journal of interpersonal violence, 25,*7, 1242-1263. doi:10.1177/0886260509340533

Allport, G. W. (1961). *Pattern and growth in personality*. New York, NY: Holt, Rinehart & Winston.

Andrews, F. M., & McKennell, A. C. (1980). Measures of self-reported well-being. *Social Indicators Research, 8*, 127-156. doi:10.1007/BF00286474

Andrews, F. M., & Withey, S. B. (1976). *Social indicators of well-being: America's perception of life quality*. New York: Plenum. doi:10.1007/978-1-4684-2253-5

Arnett, J. J. (2000). Emerging adulthood: A theory of development from the late teens through the twenties. *American Psychologist, 55*(5), 469-480. doi:10.1037/0003-066x.55.5.469

Arnett, J. J., & Tanner, J. L. (Eds.). (2006). *Emerging adults in America: Coming of age in the 21st century*. Washington, DC: American Psychological Association.

Baron, R. M., & Kenny, D. A. (1986). The moderator–mediator variable distinction in social psychological research: Conceptual, strategic, and statistical

considerations. *Journal of Personality and Social Psychology*, *51*(6), 1173-1182. doi:10.1037/0022-3514.51.6.1173

Benard, B. (1995). *Fostering resilience in children.* Urbana, IL: University of Illinois.

Berger, R., & McLeod, J. (2006). Incorporating nature into therapy: A framework for practice. *Journal of Systemic Therapies, 25*(2), 80–94. doi:10.1521/jsyt.2006.25.2.80

Berto, R. (2005). Exposure to restorative environments helps restore attentional capacity. *Journal of Environmental Psychology, 25,* 249–259. doi:10.1016/j.jenvp.2005.07.001

Besthorn, F. (2005). Beetles, bullfrog, and butterflies: Contributions of natural environment to childhood development and resilience. In M. Ungar (ed.), *Handbook for working with children and youth*. p 121-132. Thousand Oakes, CA: Sage Publications.

Bobilya, A., Akey, L., & Mitchell, D. (2009) Outcomes of a spiritually focused wilderness orientation program. *Journal of Experiential Education, 31,* 440-443. doi:10.5193/jee33.4.301

Bradburn, N. M. (1969). *The structure of psychological well-being*. Chicago: Aldine. doi:10.1017/s0033291700007637

Brown, K. W., & Ryan, R. M. (2003). The benefits of being present: mindfulness and its role in psychological well-being. *Journal of Personality and Social Psychology*, *84*(4), 822-848. doi:10.1037/0022-3514.84.4.822

Bryant, F. B., & Veroff, J. (1982). The structure of psychological wellbeing: A sociohistorical analysis. *Journal of Personality and Social Psychology, 43*, 653-673. doi:10.1037/0022-3514.43.4.653

Bryant, A. N., Choi, J. Y., & Yasuno, M. (2003). Understanding the religious and spiritual dimensions of students' lives in the first year of college. *Journal of College Student Development, 44*(6), 723-745. doi:10.1353/csd.2003.0063

Burns R.A., & Anstey K.J. (2010). The Connor-Davidson Resilience Scale (CD-RISC): Testing the invariance of a uni-dimensional resilience measure that is independent of positive and negative affect. *Personality Individual Differences*, 48(5):527-531. doi.org/10.1016/j.paid.2009.11.026

Buzzell, L., & Chalquist, C. (2009). *Ecotherapy: Healing with nature in mind*. San Francisco, CA: Sierra Club.

Campbell-Sills L., & Stein M.B. (2007). Psychometric analysis and refinement of the Connor-Davidson Resilience Scale (CD-RISC): Validation of a 10-item measure of resilience. *Journal of Trauma Stress*, 20(6):1019-1028. doi.org/10.1002/jts.20271.

Clinebell, H. (1996). *Ecotherapy: Healing ourselves, healing the earth.* New York: Haworth Press. doi:10.4324/9781315799773

Cohen, S., Kamarck, T., & Mermelstein, R. (1983). A global measure of perceived stress. *Journal of Health and Social Behavior*, 385-396. doi:10.2307/2136404

Connor, K. M., & Davidson, J. R. T. (2003). Development of a new resilience scale: The Connor–Davidson Resilience Scale (CD-RISC). *Depression and Anxiety*, *18*, 76–82. doi:10.1002/da.10113

Connor, K. M., Davidson, J. R. T., & Lee, L. (2003). Spirituality, resilience, and anger in survivors of violent trauma. *Journal of Traumatic Stress*, *16*, 487–494. doi:10.1023/A:1025762512279

Creedon, M. A. (2013). Connectedness to nature and its relationship to meaning in life Doctoral dissertation, Massachusetts School of Professional Psychology.

Csikzentmihalyi, M. (1990). *Flow: The psychology of optimal experience*. New York, NY: Harper & Row.

Cummings, C. (1991). *Eco-spirituality: Toward a reverent life*. New York, NY: Paulist Press.

Davis, J, Lockwood, L. & Wright, C. (1991) Reasons for not reporting peak experiences. *Journal of Humanistic Psychology, 31*(1), 86-94. doi:10.1177/0022167891311008

Diener, E. D., Emmons, R. A., Larsen, R. J., & Griffin, S. (1985). The Satisfaction with Life Scale. *Journal of personality assessment*, *49*(1), 71-75. doi:10.1207/s15327752jpa4901_13

Dong, F., Ablah, E., Nelson, C., Shah, S., & Khan, A. (2013). Validation of a Modified CD-RISC: Including Previously Unaccounted for Resilience Variables. *Kansas Journal of Medicine,* 11-20. url: http://hdl.handle.net/2271/1131

Evans, C. A., & Sanders, J. (Eds.). (1998). *The function of scripture in early Jewish and Christian tradition*. London, England: Bloomsbury Publishing.

Felner, R. D., Felner, T. Y., & Silverman, M. M. (2000). *Prevention in mental health and social intervention.* In Handbook of Community Psychology (pp. 9-42). Springer US. doi:10.1007/978-1-4615-4193-6_1

Fetzer, I. (1999). *Multidimensional measurement of religiousness/spirituality for use in health research: A report of the Fetzer Institute/National Institute on aging working group*. Kalamazoo, Michigan: John E. Fetzer Institute.

Field, A. (2013). *Discovering statistics using IBM SPSS statistics*. Thousand Oakes, CA: Sage.

Fisher, A. (2002). *Radical ecopsychology*: *Psychology in the service of life*. New York, NY: SUNY

Fleming, J. J., Overstreet, D. V., & Chappe, S. L. (2006). Measuring the Mission: Insights Gained Through the Boston College Questionnaire about the

Undergraduate Experience. *Current Issues in Catholic Higher Education, 25*(2), 237-263. http://jche.journals.villanova.edu/

Foa, E. B., Cashman, L., Jaycox, L., & Perry, K. (1997). The validation of a self-report measure of posttraumatic stress disorder: the Posttraumatic Diagnostic Scale. *Psychological Assessment*, *9*(4), 445. doi:10.1037/1040-3590.9.4.445

Frank, A. (1995). *The Diary of a Young Girl*, ed. Otto H. Frank and Miriam Pressler. New York, NY: Doubleday.

Frantz, C., Mayer, F. S., Norton, C., & Rock, M. (2005). There is no “I” in nature: The influence of self-awareness on connectedness to nature. *Journal of Environmental Psychology*, *25*(4), 427-436. doi:10.1016/j.jenvp.2005.10.002

Frederickson, L., & Anderson, D. (1999). A qualitative exploration of the wilderness experience as a source of spiritual inspiration. *Journal of Environmental Psychology, 19.* 21-39. doi:10.1006/jevp.1998.0110

Frame, M. W. (2003). *Integrating religion and spirituality into counseling: An approach.* Pacific Grove, CA: Brooks/Cole.

Gallup, G. H., (2002). *The Gallup poll: Public opinion 2001.* Wilmington, DE: Scholarly Resources.

George, D., & Mallery, P. (2010). *SPSS for Windows Step by Step: A Simple Guide and Reference, 18.0 Update*. Boston, MA: Pearson Education.

Greeff, A. P. & Loubser, K. (2008). Spirituality as a resiliency quality in Xhosa-speaking families in South Africa. *Journal of Religious Health, 47*, 288–301. doi:10.1007/s10943-007-9157-7

Gregoire, C. (2013, October 13). What German wisdom can teach the rest of the world about the good life. *The Huffington Post*. Retrieved from http://www.huffingtonpost.com.

Harrison, O. M., Koenig, H.G., Hays, J.C., Eme-Akwari, A. G., & Pargament, K. (2001). The epidemiology of religious coping: A review of recent literature. *International Review of Psychiatry*, *13*(2), 86-93. doi:10.1080/09540260120037317

Hartig, T., Evans, G. W., Jamner, L. D., Davis, D. S., & Gaerling, T. (2003). Tracking restoration in natural and urban field settings. *Journal of Environmental Psychology, 23,* 109-123. doi:10.1016/S0272-4944(02)00109-3

Hawks, S. (2004). Spiritual wellness, holistic health, and the practice of health education. *American Journal of Health Education*, *35*(1), 11-18. doi:10.1080/19325037.2004.10603599

Health Council of the Netherlands and Dutch Advisory Council for Research on Spatial Planning, Nature, and the Environment. (2004). *Nature and health: The influence of nature on social, psychological and physical well-being*. The Hague, Netherlands: Health Council of the Netherlands and RMNO.

Heintzman, P. (2007). Men's wilderness experience and spirituality: Further explorations. In *Proceedings of the 2007 Northeastern Recreation Research Symposium* (pp. 55-59).

Hill, P.C., Pargament, K. I., Hood, R.W., McCullough, M.E., Swyers, J.P., Larson, D.B., & Zinnbauer, B.J. (2000). Conceptualizing religion and spirituality. Points of commonality, points of departure. *Journal for the Theory of Social Behavior, 30*, 51-77. doi: 0.1111/1468-5914.00119

Hinds, J. & Sparks, P. (2009) Investigating environmental identity, well-being, and meaning. *Ecopsychology,1*(4), 181-186. doi:10.1089/eco.2009.0026

Howell, A. J., Dopko, R. L., Passmore, H. A., & Buro, K. (2011). Nature connectedness: Associations with well-being and mindfulness. *Personality and Individual Differences, 51*(2), 166-171. doi:10.1016/j.paid.2011.03.037

Ingulli, K., & Lindbloom, G. (2013). Connection to nature and psychological resilience. *Ecopsychology*, *5*(1), 52-55. doi:10.1089/eco.2012.0042.

James, W. (1902/1958). *The varieties of religious experience.* New York, NY: The New American Library.

Jang, Y., Bergman, E., Schonfeld, L., & Molinari, V. (2006). Depressive symptoms among older residents in assisted living facilities. *The International Journal of Aging and Human Development*, *63*(4), 299-315. doi:10.2190/7TTA-DQWR-T429-C4N4

Joshanloo, M. (2012). Investigation of the factor structure of spirituality and religiosity in Iranian Shiite university students. *International Journal of Psychology*, 47(3), 211-221. doi.org/10.1080/00207594.2011.617372

Jung, C. G. (1933). Modern man in search of a soul (W. S. Dell & C. F. Baynes, Trans.). New York, NY: Hartcourt, Brace & World

Jung, C. G. (1960). *On the nature of the psyche*. In H.Read et al. Eds. The Collected Works of C. G. Jung, Vol. 8. New York, NY: Pantheon Press. doi:10.4324/9780203278819

Kammann, R., & Flett, R. (1983). Affectometer 2: A scale to measure current level of general happiness. *Australian journal of psychology*, *35*(2), 259-265. doi:10.1080/00049538308255070

Kaplan, S. (1995). The restorative benefits of nature: Towards an integrative framework. *Journal of Environmental Psychology, 15*, 169-182. doi:10.1016/0272-4944(95)90001-2

Kaplan, S., & Talbot, J. F. (1983). Psychological benefits of a wilderness experience. In *Behavior and the natural environment* (pp. 163-203). Springer US. doi:10.1007/978-1-4613-3539-9_6

Kellert, S. R., & Wilson, E. O. (Eds.). (1995). *The biophilia hypothesis*. Washington, D.C.: Island Press.

Keltner, D., & Haidt, J. (2003). Approaching awe, a moral, spiritual, and aesthetic emotion. *Cognition & Emotion*, *17*(2), 297-314. doi:10.1080/02699930302297

Keyes, C. L. M. (2005). Mental illness and/or mental health? Investigating the axioms of the complete state model of health. *Journal of Consulting and Clinical Psychology, 73*, 539–548. doi:10.1037/0022-006X.73.3.539

Klassen, M. J. (2010). *Connectedness to nature: comparing rural and urban youths 'relationships with nature* (Unpublished doctoral dissertation). Royal Roads University, British Columbia.

Kobasa, S. C. (1979). Stressful life events, personality, and health: an inquiry into hardiness. *Journal of Personality and Social Psychology*, 37(1), 1. doi:10.1037/0022-3514.37.1.1

Koenig, G. & Larson, H. (2001). Religion and mental health: Evidence for an association. *International Review of Psychiatry*, 13(2), 67-78. doi:10.1080/09540260124661

Laski, M. (1961). *Ecstasy in secular and religious experiences*. London, England: The Cresset Press.

Lee, K. H., Besthorn, F. H., Bolin, B. L., & Jun, J. S. (2012). Stress, spiritual, and support coping, and psychological well-being among older adults in assisted living. *Journal of Religion & Spirituality in Social Work: Social Thought*, *31*(4), 328-347. doi:10.1080/15426432.2012.716287

Leopold, A. (1949). *A Sand county almanac; with essays on conservation from Round River*. San Francisco, CA: Sierra Club Publishing.

Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic inquiry*. Thousand Oaks, CA: Sage Publishing.

Loeffler, T. A. (2004). A photo elicitation study of the meanings of outdoor adventure experiences. *Journal of Leisure Research*, *36,* 536-556. http://js.sagamorepub.com/jlr

Louv, R.  (2005). *Last child in the woods: Saving our children from nature-deficit disorder.*  New York, NY: Workman Publishing.

Loewenthal, K. M. (1995). *Mental health and religion.* London, England: Chapman and Hall.

Luthar, S. S., & Cicchetti, D. (2000). The construct of resilience: Implications for interventions and social policies. *Development & Psychopathology, 12*, 857–885. doi:10.1017/S0954579400004156

Luthar, S. S., Cicchetti, D., & Becker, B. (2000). The construct of resilience: A critical evaluation and guidelines for future work. Child Development, 71(3), 543-562.

Lyons, J. (1991). Strategies for assessing the potential for positive adjustment following. *Journal of Traumatic Stress, 4*(1), 93–111. doi:10.1002/jts.2490040108

Maciosek, M.V., Coffield, A. B., Flottemesch, T. J., Edwards, N.M., & Solberg, L. (2010). Greater use of preventive services in U.S. health care could save lives at little or no cost. *Health Affairs*, *9*, 1656-1660. doi: 10.1377/hlthaff.2008.0701

MacKinnon, D. P., Lockwood, C. M., Hoffman, J. M., West, S. G., & Sheets, V. (2002). A comparison of methods to test mediation and other intervening variable effects. *Psychological methods*, *7*(1), 83-104. doi:10.1037/1082-989X.7.1.83

Mahoney, A., Carels, R. A., Pargament, K. I., Wachholtz, A., Leeper, E. L., Kaplar, M., & Frutchey, R. (2005). The Sanctification of the Body and Behavioral Health Patterns of College Students. *The International Journal for the Psychology of Religion, 15*(3), 221-238. doi:10.1207/s15327582ijpr1503_3

Mahoney, A., Pargament, K. I., Jewell, T., Swank, A. B., Scott, E., Emery, E., & Rye, M. (1999). Marriage and the spiritual realm: The role of proximal and distal religious constructs in marital functioning. *Journal of Family Psychology*, *13*(3), 321-338. doi:10.1037/0893-3200.13.3.321

Mahoney, A., Pargament, K. I., Cole, B., Jewell, T., Magyar, G. M., Tarakeshwar, N., & Phillips, R. (2005). A Higher Purpose: The Sanctification of Strivings in a Community Sample. *The International Journal for the Psychology of Religion, 15*(3), 239-262. doi:10.1207/s15327582ijpr1503_4

Marsh, P.E. (2008) Backcountry adventure as spiritual development: a means-end study. *Journal of Experiential Education, 30*, 290-293. http://jee.sagepub.com/

Maslow, A. H. (1976). *Religions*, *values*, *and peak experiences*. New York, NY: Penguin Books.

Maslow, A. H. (1998). *Toward a psychology of being (3rd ed.)*. Princeton, MA: D. Nostrand.

Mayer, F. S. & Frantz C. M. (2004). The connectedness to nature scale: A measure of individuals' feeling in community with nature. *Journal of Environmental Psychology 24*, 503-515. doi:10.1016/j.jenvp.2004.10.001

Mayer, F. S., Frantz, C. M., Bruehlman-Senecal, E. & Dolliver**.** (2009). Why is nature beneficial: The role of connectedness to Nature. *Environment and Behavior, 41*, 607-643. doi:10.1177/0013916508319745

Mazumdar,S., & Mazumdar, S. (1993). Sacred space and place attachment. *Journal of Environmental Psychology*, *13*(3), 231-242. doi:10.1016/S0272-4944(05)80175-6

McGahuey, A., Gelenberg, A., Laukes, C.A., Moreno, F.A., Delgado, P., McKnight, K., Manber, R. (2000). The Arizona sexual experience scale (ASEX): reliability and validity. *Journal of Sex &Marital Therapy, 26*(1), 25-40. doi:10.1080/009262300278623

McIntosh, D. N., Silver, R. C., & Wortman, C. B. (1993). Religion's role in adjustment to a negative life event: Coping with the loss of a child. *Journal of Personality and Social psychology*, *65*(4), 812-821. doi:10.1037/0022-3514.65.4.812

Meyer, B. (2001). Coping with severe mental illness: Relations of the Brief COPE with symptoms, functioning, and well-being. *Journal of Psychopathology and Behavioral Assessment*, *23*(4), 265-277. doi:10.1023/A:1012731520781

Montpetit, M. A., Bergeman, C. S., Deboeck, P. R., Tiberio, S. S., & Boker, S. M. (2010). Resilience-as-process: negative affect, stress, and coupled dynamical systems. *Psychology and Aging*, 25(3), 631–640. doi.org/10.1037/a0019268

Muir, J. (1901). *Our national parks*. Boston, MA: The Riverside Press.

Muir, J. (1911). *My first summer in the Sierra*. Boston, MA: Houghton Mifflin Company.

Muir, J. (1912). *The Yosemite*. New York, NY: The Century Company.

Muir, J. (1916). *A thousand mile walk to the gulf*. Boston, MA: Houghton Mifflin Company.

Murray-Swank, A., Mahoney, A., & Pargament, K. I. (2006). Sanctification of parenting: Links to corporal punishment and parental warmth among biblically conservative and liberal mothers. *The International Journal for the Psychology of Religion*, *16*(4), 271-287. doi:10.1207/s15327582ijpr1604_3

Murray-Swank, N. A., Pargament, K. I., & Mahoney, A. (2005). At the crossroads of sexuality and spirituality: The sanctification of sex by college students. *The International Journal for the Psychology of Religion*, 15(3), 199-219. doi:10.1207/s15327582ijpr1503_2

Neill, J. T., & Dias, K. L. (2001). Adventure education and resilience: The double-edge sword. *Journal of Adventure Education and Outdoor Learning, 1*(2), 35-42. doi:10.1080/14729670185200061

Newport, F. (2010, June 25). Gallup Wellbeing. *Americans' Church Attendance Inches Up in 2010.* Retrieved from http://www.gallup.com/poll/141044/americans-church- attendance-inches-2010.aspx

Newport, F. (2011, June 3). Gallup. *More Than 9 in 10 Americans Continue to Believe in God* Retrieved from http://www.gallup.com/poll/147887/americans-continue-believe- god.aspx

Nisbet, E. K., & Zelenski, J. M. (2011). Underestimating nearby nature affective forecasting errors obscure the happy path to sustainability. *Psychological Science, 22*(9), 1101-1106. doi:10.1177/0956797611418527.

Nisbet, E. K., Zelenski, J. M., & Murphy, S. A. (2009). The nature relatedness scale: Linking individuals' connection with nature to environmental concern and behavior. *Environment and Behavior, 41*(5), 715-740. doi.org/10.1177/0013916508318748

Nisbet, E. K., Zelenski, J. M., & Murphy, S. A. (2010). Happiness is in our nature: Exploring nature relatedness as a contributor to subjective well-being. *Journal of Happiness Studies*, *12*(2), 303-322. doi:10.1007/s10902-010-9197-7

Oman, D., & Thoresen, C. E. (2003). Spiritual Modeling: A key to spiritual and religious growth? *The International Journal for the Psychology of Religion*, *13*(3), 149-165. doi:10.1207/S15327582IJPR1303_01

Overstreet, D. (2013). Spiritual vs. religious: Perfectives from today's undergraduate Catholics. *Journal of Catholic Education*, *14* (2). http://digitalcommons.lmu.edu/ce/

Paulhus, D. L. (1994). Balanced inventory of desirable responding: Reference manual for BIDR Version 6. British Columbia, Canada: Department of Psychology, University of British Columbia, Vancouver. Unpublished manuscript doi:10.1207/S15327582IJPR1303_01

Pargament, K. I. (1997). *The psychology of religion and coping: Theory, research, and practice.* New York, NY: Guilford Press.

Pargament, K. I., Ensing, D. S., Falgout, K., Olsen, H., Reilly, B., Van Haitsma, K., & Warren, R. (1990). God help me: Religious coping efforts as predictors of the outcomes to significant negative life events. *American Journal of Community Psychology*, *18*(6), 793-824. doi:10.1007/BF00938065

Pargament, K. & Mahoney, A. (2002). Spirituality: discovery and conserving the sacred. In Snyder, C.R. & Lopez, S.J. (Eds.). *Handbook of Positive Psychology* (pp. 646-659). New York, NY: Oxford University Press

Pargament, K.I., Smith, B. W., Koenig, H. G., & Perez, L. M. (1998). Patterns of positive and negative religious coping with major life stressors. *Journal for the Scientific Study of Religion, 37*, 710–724. doi:10.2307/1388152

Perrin, J. L., & Benassi, V. A. (2009). The connectedness to nature scale: A measure of emotional connection to nature? *Journal of Environmental Psychology, 29*(4), 434-440. doi:10.1016/j.jenvp.2009.03.003

Pew Research Center (2011, November). The American-Western European values gap: American exceptionalism subsides. *Pew Research Global Attitudes*. Retrieved from http://www.pewglobal.org/2011/11/17/the-american-western-european-values-gap/

Phillips III, R. E., & Pargament, K. I. (2002). The sanctification of dreams: Prevalence and implications. *Dreaming*, *12*(3), 141. doi:10.1016/j.jenvp.2009.03.003

Piedmont, R. L. (1999). Does spirituality represent the sixth factor of personality? Spiritual transcendence and the five-factor model. *Journal of Personality, 67,* 985–1013. doi:10.1111/1467-6494.00080

Piedmont, R. L. (2001). Spiritual transcendence and the scientific study of spirituality. *Journal of Rehabilitation, 67*, 4-14. http://www.rehab.research.va.gov/jrrd/

Piedmont, R. L. (2004a). *Assessment of Spirituality and Religious Sentiments, technical manual.* Baltimore, Maryland: Author.

Piedmont, R. L. (2004b). Spiritual Transcendence as a predictor of psychosocial outcome from an outpatient substance abuse program. *Psychology of Addictive Behaviors, 18,* 223–232. doi:10.1037/0893-164X.18.3.213

Piedmont, R. L., Ciarrochi, W. J., Cy-Liacco, G. S. & Williams, J.E. (2009). The empirical and conceptual value of the spiritual transcendence and religious involvement scales for personality research. *Psychology of Religion and Spirituality, 1,* 162-179. doi:10.1037/a0015883

Piedmont, R. L., Werdel, M. B., & Fernando, M. (2009). The utility of the assessment of spirituality and religious sentiments (aspires) scale with Christians and Buddhists in Sri Lanka. *Social Scientific Study of Religion*, *20*, 131-144. doi.org/10.1163/ej.9789004175624.i-334.42

Plante, T. G. (2009). *Spiritual practices in psychotherapy: Thirteen tools for enhancing psychological health*. Washington, D.C.: American Psychological Association. doi:10.1037/11872-000

Plante, T. G., Saucedo, B., & Rice, C. (2001). The association between religious faith and coping with daily stress. *Pastoral Psychology, 49*, 291-300. doi:10.1023/A:1004819505286

Plante, T. G., & Sherman, A. C. (Eds.). (2001). *Faith and health: Psychological perspectives*. New York, NY: Guilford Press.

Plante, T. G., & Thoresen, C. E. (Eds.). (2007). *Spirit, science, and health: How the spiritual mind fuels physical wellness*. Westport, Connecticut: Greenwood Publishing Group.

Prado, G., Feaster, D. J., Schwartz, S. J., Pratt, I. A., Smith, L., & Szapocznik, J. (2004). Religious involvement, coping, social support, and psychological distress in HIV-positive African American mothers. *AIDS and Behavior*, *8*(3), 221-235. doi:10.1023/B:AIBE.0000044071.27130.46

Radloff, L. S. (1977). The CES-D scale: a self-report depression scale for research in the general population. *Applied Psychological Measurement 1*, 385-401. doi:10.1177/014662167700100306

Raftopoulos, M., & Bates, G. (2011). It's that knowing that you are not alone: the role of spirituality in adolescent resilience. *International Journal of Children's Spirituality*, *16*(2), 151-167. doi:10.1080/1364436X.2011.580729

Richards, P. S. & Bergin, A. E. (2005). *A spiritual strategy for counseling and psychotherapy* (2nd ed.). Washington, D.C.: American Psychological Association. doi:10.1037/11214-000

Richardson, G. E. (2002). The metatheory of resilience and resiliency. *Journal of Clinical Psychology, 58,* 307–321. doi:10.1002/jclp.10020

Rogers, C. R. (1961). *On becoming a person*. Boston, MA: Houghton Mifflin.

Roszak, T. E., Gomes, M. E., & Kanner, A. D. (1995). *Ecopsychology: Restoring the earth, healing the mind*. San Francisco, CA: Sierra Club Books.

Russell, K.C. (2006). Brat camp, boot camp, or …? Exploring wilderness therapy program theory. *Journal of Adventure Education and Outdoor Learning*. *6*, 51-68. doi:10.1080/14729670685200741

Rutter, M. (1985). Resilience in the face of adversity: protective factors and resistance to psychiatric disorder. *The British Journal of Psychiatry: Journal of Mental Sciences, 147*, 598–611. doi:10.1192/bjp.147.6.598

Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist*, *55*(1), 68. doi:10.1037/0003-066X.55.1.68

Ryff, C. D. (1995). Psychological well-being in adult life. *Current Directions in Psychological Science*, *4*(4), 99-104. doi:10.1111/1467-8721.ep10772395

Ryff, C.D. (1989). Happiness is everything, or is it? Explorations on the meaning of psychological well-being. *Journal of Personality and Social Psychology, 57*, 1069-1081. doi:10.1037/0022-3514.57.6.1069

Ryff, C. D., & Keyes, C. L. M. (1995). The structure of psychological well-being revisited. *Journal of Personality and Social Psychology*, *69*(4), 719-727. doi:10.1037/0022-3514.69.4.719

Ryff, C. D., & Singer, B. (1996). Psychological well-being: Meaning, measurement, and implications for psychotherapy research. *Psychotherapy and Psychosomatics*, *65*(1), 14-23. doi:10.1159/000289026

Ryff, C. D., & Singer, B. (1998). The contours of positive human health. *Psychological Inquiry*, *9*(1), 1-28. doi:10.1207/s15327965pli0901_1

Sattler, J. M. (2002). *Assessment of children: Behavioral and clinical applications* (4thed.). San Diego, CA: Jerome M. Sattler.

Sawatzky, R., Ratner, P. A., & Chiu, L. (2005). A meta-analysis of the relationship between spirituality and quality of life. *Social Indicators Research*, *72*(2), 153-188. doi:10.1007/s11205-004-5577-x

Sax, L.J., Lindholm, J. A., Astin, A.W., Korn, W.S., & Mahoney, K.M. (2001). The American Freshman: National Norms for Fall 2001. Higher *Education Research Institute*. Los Angeles, CA: UCLA. http://heri.ucla.edu/pr-display.php?prQry=19

Schultz, P. (2000). New Environmental Theories: Empathizing With Nature: The Effects of Perspective Taking on Concern for Environmental Issues. *Journal of Social Issues, 56*(3), 391-406. doi:10.1111/0022-4537.00174

Schultz, P. (2002) Inclusion with nature: Understanding the psychology of the human nature interactions. In P. Schmuck, & P.W. Schultz (Eds.), *The Psychology of Sustainable Development*. Boston, MA: Kluwer Academic Publishers. doi:10.1007/978-1-4615-0995-0_4

Schultz, P., Shriver, C., Tabanico, J. J., & Khazian, A. M. (2004). Implicit connections with nature. *Journal of Environmental Psychology*, *24*(1), 31-42. doi:10.1016/S0272-4944(03)00022-7

Sheehan, D. V. (1983). *The Sheehan disability scales. The Anxiety Disease*. New York, NY: Charles Scribner and Sons.

Sheehan, D. V., Raj, A. B., Sheehan, K. H., & Soto, S. (1990). Is Buspirone effective for panic disorder? *Journal of Clinical Psychopharmacology, 10*(1), 3-11. doi:10.1097/00004714-199002000-00002

Shiota, M. N., Keltner, D. & Mossman, A. (2007). The nature of awe: Elicitors, appraisals, and effects on self-concept. *Cognition and Emotion*, *21*(5), 944-963. doi:10.1080/02699930600923668

Sobel, M. E. (1982). Asymptotic confidence intervals for indirect effects in structural equation models. *Sociological Methodology*, *13*(1982), 290-312. doi:10.2307/270723

Sorrell, R. G. (1988). *St. Francis of Assisi and nature: tradition and innovation in western Christian attitudes toward the environment.* New York, NY: Oxford University Press

Spilka, B., Ladd, K. L., McIntosh, D. N., Milmoe, S., & Bickel, C. O. (1996). The content of religious experience: The roles of expectancy and desirability. *The*

*International Journal for the Psychology of Religion*, *6*(2), 95-105. doi:10.1207/s15327582ijpr0602_3

Stern, P. C., & Dietz, T. (1994). The value basis of environmental concern. *Journal of Social Issues,* 50(3), 65-84. doi:10.1111/j.1540-4560.1994.tb02420.x

Strife, S., & Downey, L. (2009). Childhood development and access to nature: A new direction for environmental inequality research. *Organization & Environment, 22*(1), 99–122. doi:10.1177/1086026609333340

Stringer, A. & McAvoy, H.L. (1992). The need for something different: Spirituality and wilderness adventure. *The Journal of Experiential Education, 15*, 13-20. doi:10.1177/105382599201500103

Stynes, D., & Stokowski, P. (1996). *Alternative research approaches for studying hard-to-define nature-based human values. Nature and the Human Spirit: Toward an Expanded Land Management Ethic.* State College, PA: Venture Publishing.

Tarakeshwar, N., Swank, A. B., Pargament, K. I., & Mahoney, A. (2001). The sanctification of nature and theological conservatism: A study of opposing religious correlates of environmentalism. *Review of Religious Research, 42*, 387-404. doi:10.2307/3512131

Tauber, P. G. (2012). *An exploration of the relationships among connectedness to nature, quality of life, and mental health*. (Unpublished master's thesis). Utah State University.

Tedeschi, R. G., & Calhoun, L. G. (1996). The Posttraumatic Growth Inventory: Measuring the positive legacy of trauma. *Journal of Traumatic Stress*, *9*(3), 455-471. doi:10.1002/jts.2490090305

Thoreau, D. H. (1893). *Walden: Or life in the woods*. MA: Boston. Houghton Mifflin Company.

Ulrich, R. S., Simmons R. F., Losito, B .D., Fiorito E., Miles M. A. & Nelson, A. (1991). Stress recovery during exposure to natural and urban environments. *Journal of Environmental Psychology 11,* 201-230. doi:10.1016/S0272-4944(05)80184-7

Ulrich, R. S. (1984). View through a window may influence recovery from surgery. *Science, 224*, 420-421. doi:10.1126/science.6143402

Ungar, M., Dumond, C. & McDonald, W. (2005). Risk, resilience and outdoor programs for at-risk children. *Journal of Social Work, 5*, 319- 338. doi:10.1177/1468017305058938

Van Cappellen, P., & Saroglou, V. (2012). Awe activates religious and spiritual feelings and behavioral intentions. *Psychology of Religion and Spirituality*, *4*(3), 223-236. doi:10.1037/a0025986

Van Dierendonck, D. (2012). Spirituality as an essential determinant for the Good Life, its importance relative to self-determinant psychological needs. *Journal of Happiness Studies*, *13*(4), 685-700. doi:10.1007/s10902-011-9286-2

Walsh, F. (2003). Family resilience: Strengths forged through adversity. In F. Walsh (Ed.), *Normal family processes* (pp. 399–421). New York, NY: The Guilford Press. doi:10.4324/9780203428436_chapter_15

Wells, N., & Evans, G. (2003). Nearby nature: A buffer of life stress among rural children. *Environment and Behavior, 35*, 311-330. doi:10.1177/0013916503035003001

Wicks, R. J. (1998). *Living simply in an anxious world.* Mahwah, NJ: Paulist Press.

Williams, K. & Harvey, D. (2001) Transcendent experiences in forest environments. *Journal of Environmental Psychology, 21*, 249-260. doi:10.1006/jevp.2001.0204

Wilson, E. O. (1984). *Biophilia.* Boston, MA: Harvard University Press.

Yesavage, J. A., & Sheikh, J. I. (1986). Geriatric Depression Scale (GDS) recent evidence and development of a shorter violence. *Clinical Gerontologist*, 5(1-2), 165-173. doi: 10.1300/j018v05n01_09

Yoon, D. P., & Lee, E. K. O. (2006). The impact of religiousness, spirituality, and social support on psychological well-being among older adults in rural areas. *Journal of Gerontological Social Work,* 48(3-4), 281-298. doi: 10.1300/J083v48n03_01

Zinnbauer, B. J. & Pargament, K.I. (2005) Religiousness and Spirituality. In F. R. Paloutzian & C. L. Park (Eds.), *Handbook of the psychology of religion and spirituality* (pp. 21-42). New York, NY: Guilford Press.

# APPENDIX A

## Connectedness to Nature Study – Consent Form

I agree to participate in a study of individuals involved in the Connectedness to Nature study that is being conducted by Heidi Schreiber-Pan of Loyola University, Maryland. The purpose of this study is to investigate the effects of being connected to nature.

I understand that I will be expected to participate in the study by completing a number of surveys, including the completion of a demographic form and questionnaires relating to my feelings, attitudes, and behavior. In addition, I understand that by completing all survey materials my participation in the study will be concluded. Furthermore, I understand that there is a time commitment of approximately 30 minutes for completing all survey materials.

I have been informed that any information including identifying information will be kept confidential and that all answers are entirely anonymous. Under this condition, I agree that any information obtained from this research may be used in any way thought best for publication or education.

I understand that there is minimal risk and minimal discomfort directly involved with this research and that I am free to withdraw my consent and discontinue participation in this study at any time.

If I have any questions or problems that arise in connection with my participation in this study, I should contact Heidi Schreiber-Pan, the primary investigator at (410) 593-9988 (work) or at hschreiberpan@loyola.edu

THIS PROJECT HAS BEEN REVIEWED AND APPROVED BY THE LOYOLA UNIVERSITY MARYLAND INSTITUTIONAL REVIEW BOARD (PHONE: 410-617-2561).

Note: Psych Data will allow for the following Statement to be included at the bottom of the informed consent webpage: **Clicking the ‘Continue’ Button Below Indicates Your Consent to Participate in this Research Project”**

## APPENDIX B

## Demographic Questionnaire

**1**. How old are you today (years)?

___________

**2.** What is your college major:____________?

**3**. What is your Sex? (circle one)

0 = Male 1 = Female

**4**. How would you classify the area where you currently live? (circle one)

1 = Rural 2 = Suburban 3 = Urban

**5.** How would you classify your ethnicity? (circle all that apply)

1 = American Indian or Alaska Native 2 = Asian/Asian American

3 = Black/ African American 4 = Hispanic

5 = Native Hawaiian or Other Pacific Islander 6 = White

7 = Other (specify)_____________________

**6.** Are you currently employed? (circle one)

1 = Yes, full-time

2 = Yes, part-time

3 = Yes, Seasonally

4 = No, I choose not to work at this time

5 = No, I cannot find suitable employment

**7.** What is your parents' combined annual income? (circle one)

1 = $15k or less

2 = $15k-$25k

3 = $25k-$35k

4 = $35k-$45k

5 = $45k-$55k

6 = $55k- $65k

7 = $65k- $75k

8 = $75k- $100k

9 = $100k +

**8.** If you are religious, what is your religious preference? (circle one)

1 = Protestant (denomination:___________________)

2 = Roman Catholic

3 = Jewish (type:______________)

4 = Muslim

5 = Hindu

6 = Buddhist

7 = An Orthodox Religion, such as Greek or Russian Orthodox Church

8 = Other ___________________________

**9.** To what extent do you consider yourself a *religious* person? Are you …

| Very Religious | Moderately Religious | Slightly Religious | Not Religious At All |
|---|---|---|---|
| (3) | (2) | (1) | (0) |

**10.** To what extent do you consider yourself a *spiritual* person? Are you …

| Very Spiritual | Moderately Spiritual | Slightly Spiritual | Not Spiritual At All |
|---|---|---|---|

(3) (2) (1) (0)

**11**. How often do you pray privately in places other than a church or synagogue? (mark one)

_____More than once a day (7)
_____Once a day (6)
_____A few times a week (5)
_____Once a week (4)
_____A few times a month (3)
_____Once a month (2)
_____ Less than once a month (1)
_____Never (0)

**12**. How often do you attend religious or spiritual services (mark one)?

_____Several times a week (8)
_____Every week (7)
_____Nearly every week (6)
_____2-3 times a month (5)
_____About once a month (4)
_____Several times a year (3)
_____ About 1-2 times a year (2)
_____Less than once a year (1)
_____Never (0)

***9-12 make up GRI (Global Religiousness Index)***

## APPENDIX C

Connectedness to Nature Scale (CNS) (Mayer & Frantz, 2004)

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 are presently experiencing.

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| 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 nonhuman, 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. *

*reverse scored

## APPENDIX D

Nature Relatedness Scale (NR) (Nisbet, Zelenski & Murphy, 2009)

For each of the following, please rate the extent to which you agree with each statement, using the scale from 1 to 5 as shown below. Please respond as you really feel, rather than how you think "most people" feel.

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| Disagree Strongly | Disagree a Little | Neither agree or disagree | Agree a little | Agree Strongly |

_____1. I enjoy being outdoors, even in unpleasant weather.

_____2. Some species are meant to die out or become extinct.

_____3. Humans have the right to use natural resource any way we want.

_____4. My ideal vacation spot would be a remote wilderness area.

_____5. I always think about how my actions effect the environment.

_____6. I enjoy digging in the earth and getting dirt on my hands.

_____7. My connection to nature and the environment is a part of my spirituality.

_____8. I am very aware of environmental issues.

_____9. I take notice of wildlife wherever I am.

_____10. I don't often go out in nature.

_____11. Nothing I do will change problems in other places on the planet.

_____12. I am not separate from nature, but a part of nature.

_____13. The thought of being deep in the woods, away from civilization, is frightening.

_____14. My feelings about nature do not affect how I live my life.

_____15. Animals, birds, and plants should have fewer rights than humans.

_____16. Even in the middle of the city, I notice nature around me.

_____17. My relationship to nature is an important part of who I am.

_____18. Conservation is unnecessary because nature is strong enough to recover from any human impact.

_____19. The state of non-human species is an indicator of the future for humans.

_____20. I think a lot about the suffering of animals.

_____21. I feel very connected to all living things and the earth.

# APPENDIX E

**Sanctification of Nature** Scale (Mahoney et al., 2002)

*God refers to the "Higher Power" of your belief system. Please feel free to substitute your own term for God when answering these questions. Please indicate the degree to which you agree or disagree with each of the following statements:*

| | Strongly Disagree | | | Neutral | | | Strongly Agree |
|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Nature is a temple of God | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| Nature is a gift from God | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| God is present in nature | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| God uses nature to do God's will | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| Nature is bonded to the everlasting spirit of God | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| A spark of the divine resides in nature | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| God lives through nature | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |

| | Strongly Disagree | | | Neutral | | | Strongly Agree |
|---|---|---|---|---|---|---|---|
| God is glorified through nature | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| Nature is an instrument of God | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| The power of God moves through nature | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| Nature is created in God's image | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| Nature is united with God | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |

*Please indicate the degree to which each adjective below describes your view of nature.*

| | Does Not Describe At All | | | Neutral | | | Very Closely Describes |
|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Blessed | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| Holy | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| Sacred | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| Mysterious | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| Miraculous | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| Divine | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| Awesome | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| Spirit-filled | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| Heavenly | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| Religious | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |

# APPENDIX F

**Connor-Davidson Resilience Scale (CD-RISC)** (Connor & Davidson, 2003). Please check the box indicating the extent that each statement is true for you over the past month.

| | Not at all true | Rarely true | Sometimes true | Often true | True nearly all the time |
|---|---|---|---|---|---|
| 1. I am able to adapt to change. | ☐ | ☐ | ☐ | ☐ | ☐ |
| 2. I have close and secure relationships. | ☐ | ☐ | ☐ | ☐ | ☐ |
| 3. I take pride in my achievements. | ☐ | ☐ | ☐ | ☐ | ☐ |
| 4. I work to attain my goals. | ☐ | ☐ | ☐ | ☐ | ☐ |
| 5. I feel in control of my life. | ☐ | ☐ | ☐ | ☐ | ☐ |
| 6. I have a strong sense of purpose. | ☐ | ☐ | ☐ | ☐ | ☐ |
| 7. I see the humorous side of things. | ☐ | ☐ | ☐ | ☐ | ☐ |
| 8. Things happen for a reason. | ☐ | ☐ | ☐ | ☐ | ☐ |
| 9. I have to act on a hunch. | ☐ | ☐ | ☐ | ☐ | ☐ |
| 10. I can handle unpleasant feelings. | ☐ | ☐ | ☐ | ☐ | ☐ |
| 11. Sometimes fate or God can help. | ☐ | ☐ | ☐ | ☐ | ☐ |
| 12. I can deal with whatever comes my way. | ☐ | ☐ | ☐ | ☐ | ☐ |
| 13. Past success gives me confidence for new challenges. | ☐ | ☐ | ☐ | ☐ | ☐ |
| 14. Coping with stress strengthens me. | ☐ | ☐ | ☐ | ☐ | ☐ |
| 15. I like challenges. | ☐ | ☐ | ☐ | ☐ | ☐ |
| 16. I can make unpopular or difficult decisions. | ☐ | ☐ | ☐ | ☐ | ☐ |
| 17. I think of myself as a strong person. | ☐ | ☐ | ☐ | ☐ | ☐ |
| 18. When things look hopeless, I don't give up. | ☐ | ☐ | ☐ | ☐ | ☐ |

| | Not at all true | Rarely true | Sometimes true | Often true | True nearly all the time |
|---|---|---|---|---|---|
| 19. I give my best effort, no matter what. | ☐ | ☐ | ☐ | ☐ | ☐ |
| 20. I can achieve my goals. | ☐ | ☐ | ☐ | ☐ | ☐ |
| 21. I am not easily discouraged by failure. | ☐ | ☐ | ☐ | ☐ | ☐ |
| 22. I tend to bounce back after a hardship or illness | ☐ | ☐ | ☐ | ☐ | ☐ |
| 23. I know where to turn for help. | ☐ | ☐ | ☐ | ☐ | ☐ |
| 24. Under pressure, I focus and think clearly. | ☐ | ☐ | ☐ | ☐ | ☐ |
| 25. I prefer to take the lead in problem solving. | ☐ | ☐ | ☐ | ☐ | ☐ |

**APPENDIX G**

**Scales of Psychological Well-Being (SPWB)** (Ryff, 1995) The following set of statements deals with how you might feel about yourself and your life. **Circle the number that best describes the degree to which you agree or disagree with each statement**

| | Strongly Disagree | Disagree | Disagree Slightly | Agree Slightly | Agree | Strongly Agree |
|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 |
| 1.Most people see me as loving and affectionate. | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| 2. In general, I feel I am in charge of the situation in which I live. | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| 3. I am not interested in activities that will expand my horizon. | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| 4. When I look at the story of my life, I am pleased with how things have turned out. | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| 5. Maintaining close relationships has been difficult and frustrating for me. | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| 6. I am not afraid to voice my opinions, even when they are in opposition to the opinions of most people. | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| 7. The demands of everyday life often get me | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |

| down. | | | | | | |
|---|---|---|---|---|---|---|
| | Strongly Disagree | Disagree | Disagree Slightly | Agree Slightly | Agree | Strongly Agree |
| 8. I live life one day at a time and don't really think about the future. | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| 9. In general, I feel confident and positive about myself. | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| 10. I often feel lonely because I have few close friends with whom to share my concerns. | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| 11. My decisions are not usually influenced by what everyone else is doing. | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| 12. I do not fit very well with the people and the community around me. | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| 13. I tend to focus on the present because the future nearly always brings me problems. | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| 14. I feel like many of the people I know have gotten more out of life than I have. | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| 15. I enjoy personal and mutual conversation with | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |

| family or friends. | | | | | | |
|---|---|---|---|---|---|---|
| | Strongly Disagree | Disagree | Disagree Slightly | Agree Slightly | Agree | Strongly Agree |
| 16. I tend to worry about what other people think of me. | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| 17. I am quite good a managing the many responsibilities of my daily life. | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| 18. I don't want to try new ways of doing things – my life is fine the way it is. | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| 19. Being happy with myself is more important to me than having others approve of me. | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| 20. I often feel overwhelmed by my responsibilities. | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| 21. I think it is important to have new experiences that challenge how you think about yourself and the world. | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| 22. My daily activities often seem trivial and unimportant to me. | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| 23. I like most aspects of my personality. | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |

| | Strongly Disagree | Disagree | Disagree Slightly | Agree Slightly | Agree | Strongly Agree |
|---|---|---|---|---|---|---|
| 24. I don’t have many people who want to listen when I need to talk. | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| 25. I tend to be influenced by people with strong opinions. | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| 26. When I think about it, I haven’t really improved much as a person over the years. | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| 27. I don’t have a good sense of what it is I am trying to accomplish in life. | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| 28. I made some mistakes in the past but I feel that all in all everything has worked out for the best. | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| 29. I generally do a good job of taking care of my personal finances and affairs. | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| 30. I used to set goals for myself, but that now seems like a waste of time | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| | | | | | | |

| | Strongly Disagree | Disagree | Disagree Slightly | Agree Slightly | Agree | Strongly Agree |
|---|---|---|---|---|---|---|
| 31. In many ways, I feel disappointed about my achievements in life. | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| 32. It seems to me that most other people have more friends than I do. | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| 33. I enjoy making plans for the future and working to make them a reality. | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| 34. People would describe me as a giving person, willing to share my time with others. | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| 35. I have confidence in my opinions, even if they are contrary to the general consensus. | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| 36. I am good at juggling my time so that I can fit everything in. | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| 37. I have a sense that I have developed a lot as a person over time. | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| 38. I am active person in caring out the plans I set for myself. | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |

| | Strongly Disagree | Disagree | Disagree Slightly | Agree Slightly | Agree | Strongly Agree |
|---|---|---|---|---|---|---|
| 39. I have not experienced many warm and trusting relationships with others. | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| 40. It's difficult for me to voice my own opinions on controversial matters. | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| 41. I do not enjoy being in new situations that require me to change my old familiar ways of doing things. | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| 42. Some people wander aimlessly through life, but I am not one of them. | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| 43. My attitude about myself is probably not as positive as most people feel about themselves. | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| 44. I often change my mind about decisions if my family or friends disagree. | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| 45. For me, life has been a continuous process of learning, changing and growing. | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |

| | Strongly Disagree | Disagree | Disagree Slightly | Agree Slightly | Agree | Strongly Agree |
|---|---|---|---|---|---|---|
| 46. I sometimes feel as if I have done all there is to do in life. | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| 47. I know that I can trust my friends and they know that they can trust me. | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| 48. The past had its ups and downs, but in general, I would not want to change it. | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| 49. I have difficulty arranging my life in a way that is satisfying to me. | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| 50. I gave up trying to make big improvements or changes in my life a long time ago. | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| 51. When I compare myself to friends and acquaintances, it makes me feel good about who I am. | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| 52. I judge myself by what I think is important, not by the values of what others think is important. | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |

| | Strongly Disagree | Disagree | Disagree Slightly | Agree Slightly | Agree | Strongly Agree |
|---|---|---|---|---|---|---|
| 53. I have been able to build a home and lifestyle for myself that is much to my liking. | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| 54. There is truth to the saying that you can't teach an old dog new tricks. | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |

**Spiritual Transcendence Scale**

**© 1999 by Ralph L. Piedmont, Ph.D.**
Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.

**VITA AUCTORIS**

Heidi A. Schreiber-Pan earned her undergraduate degree in Psychology from Towson University, and a master's degree in Counseling Psychology from Loyola College in 2004. She worked as a bereavement specialist, bereavement camp director, community mental health counselor, and public speaker in the greater Baltimore area for the past fifteen years. In 2007, she returned to Loyola to pursue pastoral counseling. In December 2014, Heidi completed her doctoral education at Loyola University Maryland. She is a licensed counselor and is currently working at Balanced Living Counseling, her private practice.