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A Meta-Analysis: The Relationship Between Connectedness to Nature and Well-Being

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A Meta-Analysis: The Relationship Between Connectedness to Nature and Well-Being

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A Meta-Analysis: The Relationship Between Connectedness to Nature and Well-Being

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Abstract

Ecotherapy and nature-based interventions have been shown to be evidence-based treatment for physical and mental health. The rekindling of the human and nature relationship helps cultivate a bi-directional, reciprocal circle of healing. The resulting benefit is the increased well-being of individuals, society, and the earth. This study is a meta-analytic review of 13 articles (22 studies) to examine the relationship between connection to nature and various domains of well-being, including emotional, psychological, social, and overall. Eligibility criteria for the study were the inclusion of at least one measure of connectedness to nature, one measure of well-being or life satisfaction, and a quantitative measure of their relationship. This meta-analysis combined quantitative results from multiple studies to summarize empirical knowledge on the relationship between connection to nature and well-being/life satisfaction. A random-effects model was utilized to find one common effect size, showing the overall magnitude of the relationship among these variables. Results yielded moderate to large effect sizes, revealing a positive relationship between connectedness to nature and the various domains of well-being. The findings have valuable implications, highlighting the imperative necessity to reconnect and heal our relationship with the earth in order to embrace embodiment, to advocate for social justice for a more inclusive and equitable world, and to cultivate holistic health and healing.

Keywords: connectedness to nature, nature relatedness, well-being, life satisfaction, meta-analysis

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A Meta-Analysis: The Relationship Between Connectedness to Nature and Well-Being

Chapter 1

Through research, anecdotal evidence, and personal stories, Louv (2011) argues that a strong connection to nature is an essential aspect of human health and flourishing.

Connectedness to nature expands one's sense of self, promoting self-exploration and well-being. Additionally, connectedness to nature is hypothesized to increase opportunities to experience awe and wonder, strengthen social bonding, and reignite a sense of being fully alive.

The term biophilia was introduced by E. O. Wilson (1984), which alludes to humans' innate tendency to be drawn to and focus on life and other living organisms and processes. Further expanding on this, Kellert and Wilson (1993) suggested a "biophilia hypothesis," meaning that humans possess an innate tendency to seek connections with nature and other life forms in addition to social contact with other humans. Because a majority of human evolutionary history occurred in the natural environment, with successful adaptation and survival depending on a connection with land and resources, the biophilia hypothesis suggests that connection to the natural world provided an evolutionary advantage (Kellert & Wilson, 1993).

In addition to the evolutionary and utilitarian benefits of the natural world (e.g., beyond the provision of necessary resources to meet basic needs), the study of ecopsychology is interested in connection with nature as the "soul of the world" (Fisher, 2013). Fisher describes an innate connection among the natural world, with humanity being one subcomponent of a vastly interconnected reality. This is in contrast to the human-centeredness of Western colonial and capitalistic values, in which dominance and power are highlighted in human relationships with the natural world. An important perspective of ecopsychology is viewing psychological matters

with a perspective that integrates other-than-human relationships and acknowledges the bi-directionality of humans and the larger natural world (Fisher, 2013).

Louv (2011) introduces the *nature principle*, a concept about conservation that includes a bi-directional cycle of healing describing how the earth is benefitted from greater human healing and connectedness to nature. Similar to this nature-principle concept is Bronfenbrenner's Ecological model, which emphasizes how surrounding social contexts influence individuals' development and vice versa (Guy-Evans, 2020). Individual development does not occur in a vacuum, but rather takes place through the process of complex, reciprocal interactions between various systems. Bronfenbrenner and Evans (2000), state that "evolving biopsychological human organisms" are influenced by active interactions of "persons, objects, and symbols in its immediate external environment." Although Bronfenbrenner's bio-ecological model specifically addresses human, social contexts, it can be argued to expand this concept, including one's natural surroundings in their external environment. Thus, the natural ecosystem has an influence on individuals' biopsychosocial development and, in turn, one's development has an impact on the natural environment. Holistic human health exists in the presence of a healthy, comprehensive community and natural environment.

Nature-based and Wilderness Therapies

While the field of ecopsychology moves away from a human-centered perspective in some ways, benefits of nature connection on human well-being has been explored. The term "nature-deficit disorder" is termed as a collective disorder that "threatens our health, our spirit, our economy, and our future stewardship of the environment" (Louv, 2011, p. 5). With this perspective, greater disconnection from the natural world as a result of urbanization and globalization has had a negative impact on human well-being and may be related to increases in

mental health difficulties. Conversely, connection to nature has been shown to have a variety of beneficial impacts on emotional and psychophysiological health. In an outcome study on a wilderness therapy intervention for adolescents, improvements in heart-rhythm coherence were found (Johnson et al., 2020). Another study on recreation in the natural environment compared cortisol levels between walking in nature, watching nature on TV, and walking on a treadmill (Olafsdottir et al., 2018). This study found that all three interventions improved cortisol levels, but walking in nature had the most pronounced effects.

In addition to psychophysiological benefits of nature-related interventions, emotional benefits have been associated with connectedness to nature. One study used a survey to explore differences between how indoor exercise versus a combination of indoor and outdoor exercise impact emotions and well-being, also exploring the role of connectedness to nature (Loureiro & Veloso, 2014). Findings indicated that those who engaged in a combination of indoor and outdoor exercise demonstrated more positive affect than those who engaged in indoor exercise alone. In addition, exercise promoted improved subjective well-being for individuals with greater connectedness to nature. Even virtual exposure to aspects of nature has resulted in emotional restoration and elevated positive mood (Browning et al., 2020) and reduces negative emotion and amygdala-hippocampus activation by downregulating physiological responses (Mochizuki-Kawai et al., 2020).

Additionally, nature-based therapies such as wilderness therapy, adventure therapy, and outdoor therapy provide a multidimensional approach to treatment. This represents a holistic care intervention that has resulted in positive client outcomes. In a meta-analysis studying adventure therapy outcomes, short-term adventure programs showed moderately positive, significant changes in measured outcomes between the beginning and end of treatment, but no significant

changes were found for the alternative and no treatment groups. Additionally, the short-term adventure therapy participant changes were maintained in longer-term or follow-up effect sizes (Bowen & Neill, 2013). Another study considered the subjective experiences of five women on a 10-day Scottish wilderness trip, focusing on well-being and environmental perceptions. Results showed a common positive experience of increased psychological well-being characterized by feelings of connectedness, aliveness, contemplativeness, self-discovery, confidence, and well-being (Hinds, 2011).

Ferenee et al. (2019) created a Norwegian adaptation of wilderness therapy called *Frilufsterapi* that was implemented in an adolescent mental health service in southern Norway. After time spent in nature, many participants reported experiencing calming responses to the external and internal stressors and pressures that normally surrounded them in their daily lives (Ferenee et al., 2019). Similarly, Gabrielsen et al. (2018) utilized *Frilufsterapi* and found that participants' here-and-now stress and anxiety levels decreased between pre and post-test. Additionally, the strongest variable of improvement was on the Life Effectiveness Questionnaire (LEQ), which suggested that many participants felt more mastery and enjoyed life more a year after the completion of *Frilufsterapi* (Gabrielsen et al., 2018).

Another type of outdoor adventure therapy that has shown positive benefits is surfing intervention programs. A study was conducted in the UK for children/young people excluded, or at risk of exclusion, from mainstream schooling. Results found significant drops in heart rate (suggesting improved physiological health and fitness), increased satisfaction with appearance, more positive attitudes towards school and friendship, greater environmental awareness, and more positive teacher evaluations during post-intervention assessment (Hignett et al., 2017). A pilot study provided additional grounds to suggest that wilderness therapy is a promising

integrative intervention to improve adolescent well-being and overall functioning. Participants and caregivers reported more persisting benefits in family functioning, while caregivers also reported improved psychological functioning in their children (Johnson et al., 2020). In addition, research has shown that adventure-based training programs significantly reduced depressive symptoms and anxiety levels, and increased self-esteem in Hong Kong Chinese schoolchildren (Li et al., 2012). Another study that combined Acceptance and Commitment Therapy with adventure therapy suggested that these interventions may increase psychological well-being and skill development in at-risk children (Tracey et al., 2018).

Wilderness program was also effective in increasing self-esteem and resulted in a significant shift from an external to a more internal locus of control in “at risk” adolescent boys (Martinez, 2003). Similarly, outdoor adventure therapy increased self-esteem and mastery, and mastery of achievement of personal goals which may beneficially help young people journeying and healing from mental illness (Schell et al., 2012). An EcoWellness model was utilized within a wilderness therapy program and demonstrated effectiveness in addressing the diverse mental health needs of participants (Reese et al., 2019).

Overall, these studies suggest that intentionally promoting nature connection and utilizing wilderness therapy may deepen and sustain positive short-and long-term physical and psychological client outcomes. These psychological benefits of well-being include alleviated anxiety and depressive symptoms and improved family functioning, psychological functioning, daily functioning, social connectedness, self-confidence, self-esteem, internal locus of control, life satisfaction, skills development, and environmental awareness (Bowen & Neill, 2013).

Current Study

Several meta-analyses have been published to examine natural environmental exposure and health, connection to nature and happiness, and adventure therapy on client outcomes (Bowen & Neill, 2013; Bowler et al., 2010; Capaldi et al., 2014). However, a meta-analysis has not been considered to comprehensively examine the relationship between connection to nature and well-being/life satisfaction. The current study sought to systematically identify empirical outcome studies on the relationship between connection to nature and well-being/life satisfaction.

Since many concepts and measures exist to assess the human-nature relationship, the umbrella term connection to nature was utilized for the purpose of this study to describe the common underlying construct, one's subjective connection to nature. These concepts and measures are highly correlated with one another and are similarly associated with well-being, personality characteristics, and environmental attitudes and behaviors (Capaldi et al., 2014; Tam, 2014). Additionally, well-being can be utilized as an umbrella term that involves "experiences of positive emotional states", "habitual dispositions", "pleasurable affect", and "general life satisfaction" (Cervinka, et al., 2012). The concept of well-being can also be seen as an integration of physical, mental, and social health, which is closely related to quality of life and satisfaction in life. When conceptualizing satisfaction with life, it is important to note it is a "global index of one's overall evaluation of their quality of life" (Diener et al., 1985), which would include both positively- and negatively-valenced emotions and factors (Knepple Carney, 2018).

Hypothesis

This study sought to systematically identify, analyze, and quantify outcomes of studies assessing the relationship between connection to nature and well-being/life satisfaction. The

current study hypothesized that there would be an overall positive relationship between connectedness to nature and well-being/life satisfaction. More specifically, with an increased sense of connectedness to nature, individuals would endorse higher levels of well-being and satisfaction with life.

Chapter 2

Methods

This meta-analysis was completed by using a random-effect method to examine the strength of the relationship between connection to nature and well-being/life satisfaction.

Selection of Studies

Sources were located by conducting a systematic search of computerized databases including *PsycInfo*, *Dissertation Abstracts*, and *Scopus* from the years 2000–2020. To potentially access unpublished data on the topic of ecopsychology and connectedness to nature, five prolific authors who conducted research on this domain were contacted, notifying them about the current meta-analysis assessing the relationship between connection to nature and well-being/life satisfaction, and inquiring as to any unpublished data they are willing to provide. No additional unpublished data was gathered from these authors.

Searches were conducted using the terms *connectedness to nature*, *nature connectedness*, *nature connection*, *connection to nature*, *nature relatedness*, *awe*, *wilderness therapy*, *wilderness experience*, *adventure therapy*, *ecotherapy*, *nature therapy*, *ecopsychology*, *outdoor therapy*, *environmental psychology*, *ecological psychology*, *wilderness*, *nature (environment)*, *eco wellness*, *nature-based interventions*, *nature-based counseling*, *nature-based therapy* in combination with *well-being*, *psychological well-being*, *emotional well-being*, *wellness*, *emotional health*, *hedonic well-being*, *eudemonic well-being*, *positive affect*, *happiness*, *meaning*,

life meaning, purpose, quality of life, life satisfaction, and satisfaction with life. Additionally, reference sections and bibliographies from pertinent studies were manually searched to identify relevant studies based on these search terms. This preliminary search process yielded 13 articles (22 studies) to be included in this meta-analysis.

Inclusion and Exclusion Criteria

For studies to be included in this study, articles were required to include at least one measure of connectedness to nature, one measure of well-being or life satisfaction, and a quantitative measure of their relationship. Because there was no theoretical or practical reason to exclude any age groups, all age groups were included as eligible samples. Additionally, there was no exclusion criteria placed on where the country the study was conducted, the language it was written in, or the ethnicity groups that were studied. Studies that were included had to provide sufficient information to code an effect size so results between studies could be analyzed together. Reference Table 1, 2, and 3 below for further information about inclusion criteria.

Table 1

Connectedness to Nature Measures Included

| Measure | Citation | Study number (see Table 3) |
|---|-------------------------|---|
| Allo-Inclusive Identity Scale | Leary et al., 2008 | 1, 6, 7 |
| Connectedness to Nature Scale | Mayer et al., 2009 | 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 18, 19, 21 |
| Connectedness to Nature Scale – single item | Cervinka et al., 2012 | 3, 4 |
| Inclusion of nature in self | Schultz, 2001 | 17 |
| Nature Relatedness Scale | Nisbet et al., 2009 | 6, 7, 13, 14, 15, 16, |
| Nature Relatedness Scale – Short Version | Nisbet & Zelenski, 2013 | 14, 15, 16 |

Table 2*Well-Being and Life Satisfaction Measures Included*

| Measure | Citation | Study number (see Table 3) |
|---|--|------------------------------------|
| Emotional and psychological and social well-being | Keyes (2005) | 5, 6, 7, 8 |
| Flourishing Scale | Diener et al., 2010 | 21 |
| General Health Questionnaire - 12 | Goldberg & Williams, 1988 | 12 |
| Meaning in Life Questionnaire (MLQ-P) | -Steger et al., 2006 – Canadian sample -Steger et al., 2008 – Japanese sample -Osin et al., 2014 – Russian sample | 2, 3, 4, 7, 8 |
| Mental Health Continuum-Short Form (Psychological and Social Scale) | -Lamers et al., 2010 – Canadian sample -Ozawa-de Silva et al., 2016 – Japanese sample -Zemojtel-Piotrowska et al., 2016 – Russian sample | 2 |
| Multidimensional Students' Life Satisfaction Scale | Huebner, 1994 | 19 |
| Ryff scale of psychological well-being (PWBI) | Ryff, 1989 | 5, 6, 7, 8, 14, 15, 16, 17, 18, 21 |
| Satisfaction with Life | Diener et al., 1985 | 3, 4, 9, 10, 11, 14, 15, 20, 21 |
| Sense of Meaning | Huta & Ryan, 2010 | 1 |
| Subjective Vitality Scale | Ryan and Frederick, 1997 | 1, 8, 9, 16 |
| Vitality Scale Short Form (36) Health Survey | Bullinger & Kirchberger, 1989 | 3, 4, 16, 21, 22 |
| Warwick-Edinburg Mental Well-being Scale (WEMWBS) | Tennant et al., 2007 | 12 |

Table 3*Descriptive Information of Included Samples*

| Study # | Study | N | Location | Language | Method of | | M age (years) |
|---------|---------------------------------------|------|---------------------------|----------------------------------|--|------------------------------------|---|
| | | | | | data collection | Recruitment method | |
| 1 | Capaldi et al., 2017 Study 1 | 133 | Canada Japan Russia | English, Japanese, Russian | Survey | Convenience sample – undergrad. | 20.00 |
| 2 | Capaldi et al., 2017 Study 2 | 1257 | Canada Japan Russia | English, Japanese, Russian | Survey | Convenience sample – undergrad. | Canada- 20.12 Japan- 19.41 Russia- 20.71 |
| 3 | Cervinka et al., 2012 Study 2 | 119 | Austria | German | Survey | Community Sample | 37.3 |
| 4 | Cervinka et al., 2012 Study 5 | 101 | Austria | German | Survey | Community Sample | 36.9 |
| 5 | Howell et al., 2011 Study 1 | 452 | Canada | English | Survey | Undergrad. sample | 22.17 |
| 6 | Howell et al., 2011 Study 2 | 275 | Canada | English | Survey | Undergrad. sample | 20.39 |
| 7 | Howell et al., 2013 Study 1 | 311 | Canada | English | Survey | Undergrad. sample | 22.07 |
| 8 | Howell et al., 2013 Study 2 | 227 | Canada | English | Survey | Undergrad. sample | 22.07 |
| 9 | Knepple Carney, 2018 Study 1 | 152 | USA | English | Experience sampling, online surveys | Online advertising | 37.55 |

| Study # | Study | <i>N</i> | Location | Language | Method of data collection | Recruitment method | <i>M</i> age (years) |
|---------|------------------------------|----------|------------|-------------|--|---|----------------------|
| 10 | Knepple Carney, 2018 Study 2 | 88 | USA | English | Experience sampling, online surveys | Online advertising | 39.55 |
| 11 | Knepple Carney, 2018 Study 3 | 77 | USA | English | Experience sampling, online surveys | Online advertising | 40.29 |
| 12 | Leong et al., 2014 Study 1 | 138 | Singapore | Singaporean | Online survey, pen and paper survey | Snowball sampling | 14.56 |
| 13 | Lumber et al., 2017 Study 3 | 72 | UK, Europe | English | Online survey, mixed design (walking activities) | Snowball sampling | 23.93 |
| 14 | Nisbet et al., 2013 Study 1 | 184 | Canada | English | Online survey, guided writing exercise | Undergrad. psychology | 19.48 |
| 15 | Nisbet et al., 2013 Study 2 | 145 | Canada | English | Online survey, guided writing exercise | Middle managers | 42.37 |
| 16 | Nisbet et al., 2013 Study 3 | 354 | Canada | English | Online survey, guided writing exercise | Undergrads enrolled in biology, geo, psychology | 20.03 |

| Study # | Study | <i>N</i> | Location | Language | Method of data collection | Recruitment method | <i>M</i> age (years) |
|---------|---------------------------------|------------------------------|-----------|----------|------------------------------------|---|-----------------------------------|
| 17 | Stewart & Haaga, 2018 | 94 | US | English | Video exposure, subjective measure | Amazon Mechanical Turk | 48% 41-65 (couldn't be under 18) |
| 18 | Trigwell et al., 2014 | 216 | UK | English | Self-report questionnaires | Snowball recruitment | 35.32 |
| 19 | Whitten et al., 2018 | 26, 848 | Australia | English | Self-report survey | New South Wales Child Development Study NSW-CDS | 11.92 |
| 20 | Wolsko & Lindberg 2013 Study 1 | 265 | US | English | Survey | Community college, adults in community | 30.11 |
| 21 | Zelenski & Nisbet, 2012 Study 1 | Student-331, Community - 415 | Canada | English | Survey | Psychology Department online study, ads on FB, Google, Craigslist, Amazon Mechanical Turk | Student: 20.5 Community : 32.2 |
| 22 | Zelenski & Nisbet, 2012 Study 2 | 204 | Canada | English | Survey | Psychology Department online study, ads on FB, Google, Craigslist, Amazon | 25.34 |

| Study # | Study | N | Location | Language | Method of | Recruitment | M age |
|---------|-------|---|----------|----------|------------|-------------|---------|
| | | | | | data | method | (years) |
| | | | | | collection | Mechanical | |
| | | | | | | Turk | |

Studies that met the selection criteria were coded based on definitions established by authors of the nature relatedness and well-being scales (see Tables 4 and 5). The Nature Relatedness Scale (Nisbet et al., 2009) was utilized as a framework to code connectedness to nature. In this framework, connectedness to nature is measured as an overall index, including three subdomains of Emotional (self), Cognitive (perspective), Physical (experience). For the purposes of this study, only measures that represented overall connectedness to nature were included. Well-being and life satisfaction were coded based on Keyes' (2005) concept of mental health and well-being, including categorization into a summary score (overall well-being index) and three different subdomains: Emotional well-being, Social well-being, and Psychological well-being. Emotional well-being, Psychological well-being, Social well-being, and Overall well-being were utilized as the well-being outcomes explored in this study. See Table 4 and Table 5 for more details.

Table 4

Connectedness to Nature: Definition and Scales Included

| Connectedness to Nature Overall Index |
|---|
| <p><i>Definition: Overall NRS (Nisbet, 2009):</i></p> <ul style="list-style-type: none"> ● <i>Appreciation for and understanding of our interconnectedness with all other living things on the earth</i> ● <i>Summary score of overall connectedness to nature</i> ● <i>Including overall connectedness to nature ratings</i> ● <i>Including sense of oneness/interconnectedness with the natural world</i> |
| <p>Connectedness to Nature Scale (CNS) – single: "My connectedness with nature is" (rating on 1–10) (Cervinka et al., 2012)</p> |

 Connectedness to Nature Overall Index

Connectedness to Nature Scale (CNS): Sense of oneness with the natural world - feels a sense of community, equality, kinship, embeddedness, and belongingness to nature (Mayer et al., 2009)

Nature Relatedness Scale (NRS & NRS-short): How individuals relate to natural world overall through viewing their beliefs and physical connections (Nisbet & Zelenski, 2009 & 2013)

Allo-Inclusive Identity Scale: Sense of interconnectedness with other people and the natural world (Leary et al., 2008)

Inclusion of nature in self: How individuals include nature within their views of themselves (Schultz, 2001)

Table 5*Emotional, Psychological, Social, and Overall Well-being: Definition and Scales Included*

| Type of well-being | Definition | Scales included |
|--------------------|---|--|
| Emotional | <ul style="list-style-type: none"> (Keyes, 2005): Positive affect, happiness, interest in life, satisfaction with life Including life satisfaction across key domains (family, friends, school, living environment, and self) Including global cognitive judgment of one's life satisfaction | <ul style="list-style-type: none"> Mental Health Continuum (MHC) short Multidimensional Students' Life Satisfaction Scale (Huebner, 1994) Satisfaction with Life (Diener et al., 1985) |
| Psychological | <ul style="list-style-type: none"> (Keyes, 2005): Self-acceptance, positive relations with others, personal growth, purpose in life, environmental mastery, and autonomy Including self-perceived success in relationships, self-esteem, purpose, and optimism Including sense of meaningful existence, meaningfulness in activities and experiences | <ul style="list-style-type: none"> MHC short: Psychological Flourishing Scale (Diener et al., 2010) Meaning in Life Questionnaire (MLQ-P): Presence Subscale Scale of psychological well-being (PWBI, Ryff, 1989) General Health Questionnaire-12 (Goldberg & Williams, 1988) Sense of Meaning (Huta & Ryan, 2010) |
| Social | <ul style="list-style-type: none"> (Keyes, 2005): Social acceptance, social actualization, social contribution, social coherence, and social integration Including social contribution, integration, actualization/growth, acceptance, and coherence/interest | <ul style="list-style-type: none"> MHC Short Social |
| Overall | <ul style="list-style-type: none"> (Keyes, 2005): combination of emotional, psychological, and social well-being to reach optimal mental health, providing a sense of energy and vitality Including life satisfaction Including vitality, being full of energy, vigor, feeling alive and alert, having energy available to self Including feeling and functional aspects of mental well-being | <ul style="list-style-type: none"> Vitality Scale Short Form (Bullinger & Kirchberger, 1989) Subjective Vitality Scale (Ryan & Frederick, 1997) Warwick-Edinburg Mental Well-being Scale (WEMWBS) (Tennant et al., 2007) Multidimensional Students' Life Satisfaction Scale (Huebner, 1994) Satisfaction with Life (Diener, 1985) |

Data Analysis

Meta-analysis is a quantitative technique that synthesizes the results of multiple studies on a specific phenomenon or focuses on specific relationships between variables by “combining the effect size estimates from each study into a single estimate of the combined effect size” (APA dictionary of psychology, n.d.). In a meta-analysis, weights are assigned to each study based on the inverse of the overall study error variance (that is, $1/\text{variance}$). Studies with a precise estimate of the population effect size (a low variance) are assigned more weight, while studies with a less precise estimate of the population effect size (a high variance) are assigned less weight. Meta-analyses can be conducted using a fixed-effects (FE) model, which assumes that differences between study effect sizes and the population mean are a result of subject-level sampling error. An alternative to the FE model is a random-effects (RE) model, which assumes the influence of both sampling error and randomly distributed sources of variance (Lipsey & Wilson, 2000). The RE model has the advantage of permitting inferences to studies with participants and measures different from those included in the meta-analysis, whereas the FE model limits inferences to studies with parameters identical to those of the studies included (Hedges & Vevea, 1998). This meta-analysis was completed by using an RE model to examine the strength of the relationship between the variables of connectedness to nature, well-being, and life satisfaction. The RE model finds the estimated mean of the distribution of true effects, allowing for more balanced weights placed on studies (Borenstein et al., 2009). Heterogeneity tests (Q statistic) indicate whether distributions of effect sizes show greater variance than expected due to sampling error. Studies that had lower variance in the information gathered were more precise, and thus more weight was given the effect size of those studies.

Articles and data that were analyzed were entirely quantitative. Because most studies provided correlations between continuous measures of connectedness to nature and well-being, a correlation was selected as the effect size measure. Both RE and FE models were calculated, and data analysis followed procedures described in Borenstein et al. (2009), and used Fisher's Z-transformed correlation coefficients weighted by the inverse of the variance (D. B. Wilson, 2005).

Chapter 3

Results

Descriptive

Tables 4 and 5 present connectedness to nature and well-being codes for individual studies. Table 6 provides descriptive statistics for the sample of studies included. The majority of studies were based on self-reports of connectedness to nature and well-being in undergraduate students or other adults recruited online. Effects were computed between overall connectedness to nature and two levels of well-being (overall and subdomains of Emotional well-being, Psychological well-being, and Social well-being).

Table 6

Meta-Analytic Results Summary

| | Overall well-being | Emotional well-being | Psychological well-being | Social well-being |
|---|----------------------------|---------------------------|------------------------------|---------------------------|
| <i>k</i> | 9 | 21 | 19 | 9 |
| <i>N</i> | 3,202 | 35, 580 | 11,019 | 5, 672 |
| Mean of d unbiased | 0.51 | 0.31 | 0.5 | 0.49 |
| <i>SE</i> | 0.009 | 0.003 | 0.002 | 0.013 |
| Range of d unbiased | 0.22 - 0.77 | 0.34 - 0.56 | -1.11 | 0.28 - 0.70 |
| Weighted average ES: FE model (95% CI) | 0.51*** (0.501 - 0.519) | 0.30** (0.297 - 0.303) | 0.49** (0.488 - 0.492) | 0.47** (0.457 - 0.483) |

| | Overall well-being | Emotional well-being | Psychological well-being | Social well-being |
|---|---------------------------------|----------------------------------|----------------------------------|---------------------------------|
| Weighted average ES: RE model (95% CI) | 0.51*** (0.501 - 0.519) | 0.31** (0.307 - .313) | 0.53*** (0.528 - 0.532) | 0.49** (0.477 - 0.503) |
| Z (<i>p</i> -value) | Z = 59.58 (<i>p</i> < .001) | Z = 116.59 (<i>p</i> < .001) | Z = 234.09 (<i>p</i> < .001) | Z = 35.91 (<i>p</i> < .001) |
| Heterogeneity Q (<i>df</i>) | 5149348540 (<i>df</i> = 8) | 3550.26 (<i>df</i> = 20) | 11931475.34 (<i>df</i> = 18) | 1297.97 (<i>df</i> = 8) |
| I ² | 99.99% | 99.77% | 99.99% | 99.38% |

Note. **medium effect, ***large effect

A correlation of .10 was considered a small effect, .30 a medium effect, and .50 a large effect (Cohen, 1988). The effect size measures the strength of the relationship between two variables, connectedness to nature and a specific domain of well-being. Mean effects were in expected directions, with connectedness to nature positively associated with overall well-being (FE ES = .51, RE ES = .51), emotional well-being (FE ES = .30, RE ES = .31), psychological well-being (FE ES = .49, RE ES = .53), and social well-being (FE ES = .47, RE ES = .49). Statistical significance was computed using the Wald test.

Furthermore, I² and Q statistics were used to assess heterogeneity in pooled effect sizes (Higgins et al., 2003). Cochran (1954) Q statistic reflects the total variance in the meta-analysis, while the I² statistic represents heterogeneity (Higgins & Green, 2011). All tests of heterogeneity were significant, indicating that effect sizes were heterogeneous and variation in effect sizes was not due simply to sampling error. Given the heterogeneity, the RE results are likely more generalizable (Card, 2011).

Chapter 4

Discussion

In the field of ecopsychology, it has been argued that a strong connection to nature is an essential aspect of human health and flourishing, expanding one's sense of self, promoting, self-

exploration, and improving well-being (Louv, 2011). An important perspective of ecopsychology is viewing psychological matters with a perspective that integrates other-than-human relationships and acknowledges the bi-directionality of humans and the larger natural world (Fisher, 2013). Greater disconnection from the natural world as a result of urbanization and globalization has negatively impacted human well-being and may be related to increases in mental health difficulties (Louv, 2011). Conversely, connection to nature has shown a variety of beneficial impacts on emotional and psychophysiological health including improvements in heart-rhythm coherence (Johnson et al., 2020), improved cortisol levels (Olafsdottir et al., 2018), increased positive affect and improved subjective well-being (Loureiro & Veloso, 2014), and emotional restoration and elevated positive mood (Browning et al., 2020). Research on wilderness therapy interventions suggests that intentionally promoting nature connection and utilizing wilderness therapy may deepen and sustain positive short-and long-term physical and psychological client outcomes such as alleviated anxiety (Ferenee et al., 2019), decreased depressive symptoms (Li et al., 2012), and improved psychological functioning (Tracey et al., 2018).

Several meta-analyses have been published to examine natural environmental exposure and health, connection to nature and happiness, and adventure therapy on client outcomes (Bowen & Neill, 2013; Bowler et al., 2010; Capaldi et al., 2014). However, a meta-analysis has not been considered to comprehensively examine the relationship between connection to nature and well-being/life satisfaction. This study strived to provide a quantitative summary of the literature on the relationship between connectedness to nature and well-being across various domains, including psychological, emotional, social, and overall well-being. For this study, overall connectedness to nature was explored. This concept represents not just love of nature,

enjoyment of nature, or the frequency of one's activities in nature, but a deep understanding and awareness of all aspects of the natural world and individuals' interconnectedness with all living things. It involves the intersection of affective, cognitive, and experiential aspects of individuals' connection to nature (Nisbet et al., 2009). It was hypothesized that one's connectedness to nature would be related to one's well-being across various domains, including psychological, emotional, social, and overall well-being. The different domains of well-being are defined below. Through a comprehensive meta-analytic review of empirical studies, the results supported and elaborated on prior research indicating a link between connectedness to nature and well-being/life satisfaction. These promising results open the door for future research and clinical implications for ecopsychology and ecotherapy, growing branches within the field of psychology.

Outcomes

It was hypothesized that the meta-analysis results would indicate an overall positive relationship between connectedness to nature and well-being/life satisfaction, such that individuals who experienced a stronger sense of connectedness to nature were hypothesized to also endorse higher levels of well-being, across various domains. In sum, results yielded moderate to large effect sizes categorizing the positive relationship between connectedness to nature and domains of well-being/life satisfaction. It is important to understand that correlation does not equal causation. Higher connectedness to nature may cause increased well-being, higher well-being may cause increased connectedness to nature, or another variable might be leading to changes in both variables. Correlation is the magnitude or strength between the relationships of the two variables, connectedness to nature and a domain of well-being, but does not explicitly identify the cause of change between the variables. Refer to Table 6 for result details.

Connectedness to Nature and Emotional Well-Being

The relationship between connectedness to nature and emotional well-being (e.g., positive affect, satisfaction with life, and happiness) was quantified by an effect size of .31. This suggests that while an individual's level of connectedness to nature is not the only influence on their emotional well-being, its predictive ability is moderate. This builds upon past studies that have explored nature-based recreation related to increased well-being. One such study shows that nature-based recreation activities, emphasizing connection to nature, are positively associated with life satisfaction and happiness (Claudio et al., 2019). Another study revealed that fascination in nature and time in nature was associated with reduced negative affect and higher positive affect in some participants (Sato & Conner, 2013). Additionally, a study showed that the more awe participants experienced while walking, rumination and negative affect significantly decreased (Lopes et al., 2020). Past studies showed that nature-based recreation activities, fascination and time in nature, and awe may have impacted emotional well-being. Expanding on this, the current study suggests that connectedness to nature may moderately increase individuals' positive affect and happiness and bolster their life satisfaction and interest across key domains, such as family, friends, school, living environment, and self.

Connectedness to Nature and Psychological Well-Being

The relationship between connectedness to nature and psychological well-being (e.g., self-esteem, mastery, and personal growth) revealed an effect size of .53. This may indicate that individuals' level of connectedness to nature largely impacts their psychological well-being. Past studies revealed that outdoor adventure groups and adventure-based training groups promote self-esteem and an increased sense of mastery (Schell et al., 2012 Li et al, 2012). Another study done by Lovoll et al. (2020) found that personal growth was correlated with

feeling at home in nature. This shows that psychological well-being could be impacted by various outdoor and adventure-based groups and experiencing a sense of home in nature. The meta-analysis builds on these findings, suggesting that individuals' sense of self-esteem, mastery, and personal growth is positively associated with a higher level of connectedness to nature.

Connectedness to Nature and Social Well-Being

Additionally, the relationship between connectedness to nature and social well-being (e.g., social growth, social connectedness, and engagement) was explored, yielding an effect size of .47. This demonstrates a moderate to strong relationship between individuals' connectedness to nature and social well-being. Past research revealed mixed results regarding the relationship between experiences with nature and social well-being. Research by Schell et al. (2012) revealed that adventure therapy increased self-esteem, which may facilitate social growth and development. Additionally, a study done by Moreton et al. (2019) discovered small relationships between connectedness to nature and measures of loneliness, social disconnection, and connection to close others. However, it revealed consistent moderate correlations between connectedness to nature and connection to abstract social groups (e.g., collective humanity) and connection with distant others (e.g., people in need). This suggests that adventure therapy may promote social growth and development, and nature may afford feelings of connectedness to greater humanity. The current study expands on past research, revealing that social well-being appears to be moderately correlated with connectedness to nature.

Connectedness to Nature and Overall Well-Being

Regarding connectedness to nature and overall well-being, meta-analytic results yielded an effect size of .51. This suggests that there is a significantly strong relationship between connectedness to nature and overall well-being. Overall well-being, which includes vitality,

feeling alive and full of energy, experiencing an optimal balance of emotional, psychological, and social health, was shown to be positively correlated with individuals' connectedness to nature. In summary, the meta-analysis hypothesized that the results would indicate an overall positive relationship between connectedness to nature and well-being/life satisfaction. The data supported this hypothesis, revealing moderate to strong correlations across various domains of well-being, including emotional, psychological, social, and overall well-being. These findings support prior research reflecting that nature connectedness is associated with greater vitality, positive affect, and life satisfaction (Capaldi et al., 2014); is essential for mental well-being and aids in anxiety reductions (Martyn & Brymer, 2016); and is a significant predictor of happiness and cultivating sustainable environmental and personal health behaviors (Zelenski & Nisbet, 2012). This meta-analysis revealed that the internal value and sense of interconnectedness between individuals and nature/the larger world is related to well-being across various domains.

Limitations

The major limitations associated with this study include the heterogeneity within the results and the sample limitations within the selected studies. Across the results, the homogeneity analysis yielded high heterogeneity within the sample. A non-significant homogeneity analysis would indicate that study-to-study variability could be accounted for by sampling error alone. This may imply that there may be some variables moderating the magnitude of the effect size as the literature and studies utilized were diverse in nature and scope. There is often a significant discrepancy in effect sizes between different studies measuring the same outcome due to various reasons. A potential reason may be a result of various conceptualizing and definitions of the study variables and varying purposes that determined which questionnaires were utilized. Another reason may be due to the presence of moderators that were not accounted for. Thus,

further research needs to be done to help understand and explain the diversity and potential moderators presented in this study. Further, another sample limitation within the selected studies was that most participants were college students or adult workers recruited online. The lack of diversity of various identity markers within the sample limits the generalizability of the findings.

Recommendations for Future Research/Directions

Given the significant heterogeneity within the results, further research should include larger sample sizes to analyze for moderators. This can increase understanding about the possible reasons for the variance and diversity in connectedness to nature and well-being results. It would also be beneficial for future research studying the relationship between connectedness to nature and well-being to utilize a diverse population sample that embodies various identity markers to improve the generalizability of the findings.

It would also be beneficial for future research to continue studying how nature and our relationship and interaction with the outside world impact different aspects of human health and functioning. This can continue to provide valuable insight to bolster nature-based interventions and holistic conceptualizations. For example, perhaps attachment theory and analysis of the relationships between different attachment styles (i.e., secure, anxious-preoccupied, dismissive-avoidant, and disorganized) and nature (Bartholomew & Horowitz, 1991) could provide insightful information into ones' nature connectedness, environmental sustainability, and levels of health.

Implications for Clinical Practice

These promising results provide helpful information that benefits both clinicians and patients. One of the core implications of this study is that increasing individuals' connectedness to nature can benefit well-being across various domains. As mentioned before, Louv's (2011)

phrase of “nature-deficit disorder” reveals an ever-growing problem in our quickly urbanized and technology-focused world. Research suggests that nature-deficiency, alienation and disconnection from nature, contributes to higher rates of physical and emotional illnesses and behavioral problems (Louv, 2011). Clinicians hold the responsibility to provide the best care for clients, which necessitates moving forward from old paradigms of therapy into transformed practices that are life-sustaining, deeply relational, nature-based, and accessible for all. Incorporating nature-based interventions and providing spaces for clients to explore their understanding, experiences, and relationship with nature may be beneficial to increase clients’ physical, psychological, and social health.

Also, increasing our connectedness to nature and healing our relationship with the earth allows for the integration of all parts of selves. The disconnection from nature often reflects a severance between our mind and body. Mind-body connection is essential to allow individuals to tap into our intuitive heart and bodily wisdom, allowing for more room to attune to ourselves and the earth and react less from anxiety, stress, rage, and fear (Buzzell & Chalquist, 2009). Only relying on cognition and intellect results in a disembodied experience, severing us from wisdom held within our bodies and nature. Developing more connection with nature and healing our relationship with nature can allow for individuals to become more integrated and whole, resulting in overall better well-being.

Additionally, the rise of ecopsychology can be an instrumental force for the field of psychology to advocate for social justice and take steps to change oppressive systems. Ecopsychology explores and sheds light on how the misuse of the land and the earth parallels the mistreatment and marginalization of women, BIPOC individuals, and other groups of less privilege and power (Buzzell & Chalquist, 2009). Through healing our relationship with nature

and the greater-than-human world, it may be an integral aspect of making strides towards social justice and dismantling oppressive systems and narratives. It is imperative that the field of psychology partakes in its responsibility to deconstruct the Western, colonized, white framework and transform into a discipline that is more inclusive, equitable, and culturally sensitive. This healing requires both clinicians and clients to take their personal responsibility to do their own work to develop a healthier relationship with nature, build awareness of their positions of power and privilege, and take action to decenter oppressive systems.

As ecopsychology and ecotherapy continue to grow and integrate into the field of psychology, it is important that more continuing education workshops, conferences, and trainings are provided for clinicians. Additionally, spending more time connecting with nature and being healed through that interaction may contribute to more proactive behaviors to promote environmental sustainability (Zelenski & Nisbet, 2012). This symbiotic cycle of reciprocal giving and taking between humans and nature cultivates an environment that nurtures flourishing and thriving - a bi-directional healing for both people and the world. According to traditional Aboriginal perspective, the concept of health involves the balance and close interconnectedness of the personal, social, and ecological. It is essential to reconnect and heal relationship with nature because “if the land is sick, [we] are sick” (Kenyon, 2019).

Conclusion

The meta-analysis synthesized data from 22 articles to study the relationship between connectedness to nature and well-being across various domains, including psychological, emotional, and overall well-being. The results revealed medium to large effect sizes, indicating medium to strong correlations and relationships between connectedness to nature and well-being. These results elaborated on prior research on this domain and cultivated a foundation for further

promising research and clinical implications regarding ecopsychology and ecotherapy.

Additionally, it highlighted the imperative necessity to reconnect and heal our relationship with the earth in order to embrace embodiment, to advocate for social justice for a more inclusive and equitable world, and to cultivate holistic health and healing.

“To be alive in this beautiful, self-organizing universe - to participate in the dance of life with a sense to perceive it, lungs that breathe it, organs that draw nourishment from it - is a wonder beyond words.” - Joanna Macy

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Appendix

Naomi Wu

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I am dedicated to come alongside others in their pain and struggle, to listen deeply and honor stories and experiences, to extend grace and compassion, and to cultivate safe, sacred spaces for healing.

EDUCATION

- | | |
|--------------------------------|---|
| 2019-2024 (anticipated) | <p>PsyD Doctorate in Clinical Psychology</p> <ul style="list-style-type: none"> • George Fox University; Newberg, OR • APA Accredited Program • Dissertation: <i>A Meta-analysis: The Relationship between Connectedness to Nature and Well-Being</i> • Defended: March 2022 • Published: September 2022 |
| May 2021 | <p>M.A. Clinical Psychology</p> <ul style="list-style-type: none"> • George Fox University; Newberg, OR • APA Accredited Program |
| Dec 2018 | <p>B.A. Psychology, <i>Summa Cum Laude</i></p> <ul style="list-style-type: none"> • Biola University; La Mirada, CA • Minor: Biblical Studies • GPA: 4.00 |

SUPERVISED CLINICAL TRAINING EXPERIENCE

Pre-Internship

August 2022 – Present

Site: George Fox University – Health and Counseling Center

Location: Newberg, OR

Treatment Setting: University Counseling

Supervisors: Bill Burhow, PsyD; Luann Foster, PsyD

- Population: College-age students, with various intersection of identity markers including ethnicity, disability, religion, SES, gender identity, and sexual orientation
- Provided intakes, consultations, risk-assessment, and psychotherapy to college students ranging from trauma processing, PTSD, sexual assault, racial/cultural identity processing, sexual orientation exploration, grief processing, interpersonal distress, religious/spirituality exploration, anxiety and depression, panic disorders,

- personality disorders, adjustment disorders, family of origin problems, and disordered eating
- Exhibited ability to work within short-term modalities (2-6 sessions) and longer-term modalities (15+ sessions) in collaboration with supervised treatment plans and client's goals for care
- Participated in weekly group trainings and individual supervision ranging in topics from theoretical orientation, treatment planning, diagnoses, grief/loss, risk assessment, academic support, etc.
- Collaborated with the Athletic department and facilitated table discussions at mental health forums on various topics including: body image & self-esteem, depression & anxiety, self-care, identity outside of athletics, and burnout

Practicum 2

August 2021 – 2022

Treatment Setting: Integrated Behavioral Healthcare

Quarterly clinical rotations within Yakima Valley Farm Workers Clinic (YVFWC):

- Lancaster Family Health Center (Salem, OR)
- Lancaster Family Health Clinic – Beverly (Salem, OR)
- Salud Medical Center (Woodburn, OR)
- Pacific Pediatrics (Woodburn, OR)

Supervisors: Lola White, PsyD; Jessica Beeghly, PsyD

- Population: Children, adolescents, and adults from lower income families with diverse ethnic backgrounds and a range of sexual orientations and disability statuses
- Provided behavioral health services including risk assessment, scheduled BHC sessions, and warm hand-offs, for a wide range of physical and mental health concerns in four Integrated Behavioral Healthcare settings
- Collaborated and consulted with various healthcare providers
- Conducted integrated, comprehensive assessments for diagnostic clarification and provided sensitive feedback to advocate for patients' healthcare needs
- Utilized interpreters to effectively and sensitively communicate with patients who spoke a variety of languages, predominately Spanish

Supplemental Practicum

Jan 2022 – Present

Site: Shaun Davis, PsyD (Private Practice)

Location: Newberg, OR

Setting: Private Practice

Supervisor: Shaun Davis, PsyD

- Population: Broad range of ages; diversity and intersectionality of various identity markers, reflective of geographic demographics
- Provided low-cost, long-term therapy for a range of mental health and emotional concerns
- Practiced conceptualizing from and received supervision from an emotionally focused (EFT) and attachment-focused lens

Supplemental Practicum**Fall 2021***Site:* West Hills Healthcare Clinic*Location:* McMinnville, OR*Setting:* Integrative Primary Care*Supervisor:* Joy Mauldin, PsyD

- Developed and administered comprehensive assessment batteries including cognitive, behavioral and personality assessments for patients referred by primary care physician and behavioral health provider(s) across the lifespan
- Reason for referrals include: attention, concentration, and mood concerns
- Interpreted batteries, report assessments reports, and provided feedback for integrated reports in collaboration and direct supervision of Dr. Mauldin

Practicum 1**August 2020 - 2021***Site:* Behavioral Health Center – Therapy Clinic*Location:* George Fox University; Newberg, OR*Setting:* Outpatient Community Mental Health*Supervisor:* Michael Vogel, PsyD, Director of George Fox Behavioral Health Center

- Population: Children, adolescents, and adults from lower income families who were uninsured or underinsured, with diverse ethnic backgrounds and a range of sexual orientations and disability statuses
- Provided outpatient therapy services from initial intake assessment to termination to individuals across the lifespan with a variety of mental health and co-occurring disorders, averaging 5-12 sessions per client, with some longer-term care
- Managed administrative front-desk duties including responding to email and calls, scheduling own client appointments, billing adherence to the clinic's sliding scale fee system, and handling urgent need intake referrals from local hospitals
- Participated in weekly individual supervision, group didactics, and clinical teams
- Provided virtual Telehealth services through utilization of HIPPA compliant videoing software

Pre-Practicum**January – May 2020***Site:* George Fox University*Location:* Newberg, Oregon*Setting:* College Counseling*Supervisor:* Glenna Andrews, Ph.D.; Carl Sallee, MA*Population:* Two adult university students

- Provided 10 weekly, recorded psychotherapy sessions to two undergraduate students with weekly supervision of recordings, including clinical interviewing/intake, treatment planning and diagnostic impression skills through a person-centered lens
- Received weekly supervision from a master-level pre-intern student

Clinical Team Member

Sept 2019 – Present

George Fox University, Newberg, OR

Supervisors: Kenneth Logan, PsyD; Kristie Knows His Gun, PsyD; Amber Nelson, PsyD; Megan Cormier-Castaneda, PsyD

- Meet weekly as part of a vertical training learning model and consultation group with a licensed psychologist to discuss clinical cases, receive supervision, and practice skills pertaining to an interdisciplinary team of psychologists
- Experiential learning as a supervisor-in-training by giving summative and formative feedback to second-year doctoral trainees in presence of a licensed psychologist
- Successful preparation and completion of:
 - Scientific Foundations Examination (SFE): March 2021
 - Clinical Intervention and Assessment Examination (CIAE): March 2022

CLINICAL INTERESTS:

- Holistic conceptualization, interventions, and well-being
- Equity, Inclusivity, Diversity, Cultural Responsivity
- Decolonizing mental health and psychology
- Psychodynamic Therapy and Attachment, Humanistic Therapy, Multicultural Feminist Theory
- Trauma-informed care – individual, relational, intergenerational, systemic
- Ecopsychology, Ecotherapy, and Nature-Based therapy
- Sports Psychology and Performance Enhancement
- Embodiment, Body Work, Body Image Resiliency, and Health at Every Size
- Healing movement, Yoga therapy, Somatic work

PUBLICATION AND RESEARCH EXPERIENCE

Wu, N., Jones, C., (2022, Sept) The Relationship between Connectedness to Nature and Well-Being: A Meta-Analysis. *Current Research in Psychology and Behavioral Science (CRPBS)*, Volume 3, Issue 6 DOI:10.54026/CRPBS/1064

Stusser, A., Wu, N., Peterson, K., Williams, C., Nelson, A., Rodriguez, D. (2022, May) *Vaccine Perceptions: Private Christian College Vaccine Perceptions from Diverse Ethnic, Religious, and Political Backgrounds* [WPA Poster Showcase] WPA 2022 Annual Convention, Portland, OR, USA.

Williams, C., Wu, N., Peterson, K., Stusser, A., Nelson, A., Rodriguez, D. (2022, March) *Private Christian College Students' Perceptions of the COVID-19 Vaccine* [CAPS Poster Showcase] CAPS 2022 Virtual Annual Conference. <https://new.caps.net/2022-conference/>

Flores, M., Bigon, J., Price, L., Wu, N., Knows His Gun, K., Gathercoal, K. (2021, April 30-May 1) *Competence Working with Diverse Population Conducting Risk Assessment in the Emergency Department* [OPA Poster Showcase] Oregon Psychological Association Virtual 2021 Annual Conference. <https://www.opa.org/opa-annual-conference>

Eltiti, S., Davis, K., **Wu, N.** (2020, June – September) *Mobile phone problem use in connection to impulsivity, anxious attachment, sleep Quality, and inhibitory control* [APS Poster Showcase] APS 2020 Annual Convention, Chicago, IL, USA.

<https://www.psychologicalscience.org/conventions/2020-virtual-poster>

Research Vertical Team Member

2019 - Present

George Fox University; Newberg, OR

Committee Chair: Celeste Jones, PsyD; Amber Nelson, PsyD; Mark McMinn, PhD, ABPP

- *Research:* meet bi-monthly with research team composed of 1st – 4th year doctoral students and research supervisor to discuss and evaluate progress, methodology, and design of group and individual research projects, including dissertation
- *Dissertation:* A Meta-analysis: The Relationship between Connectedness to Nature and Well-Being
 - Preliminary Defense Completed: November 2021
 - Final Defense Completed: March 2022
 - Published: September 2022 || *Current Research in Psychology and Behavioral Science* (CRPBS) Journal

Research Assistant

2016– 2018

Biola University; La Mirada, California

Supervisor: Stacy Eltiti, PhD

Study: Mobile Phone Problem Use in Connection to Impulsivity, Anxious Attachment, Sleep Quality, and Inhibitory Control

- Drafted PHRRC application and received approval to run test experiment
- Read literature reviews and researched experimental methods to gain more knowledge about cell phone addiction and how that correlates with impulsivity and overall health
- Programmed experiment and created go/no-go tests using E-Prime application
- Provided feedback for poster showcased at APS 2020

Research Intern

May – Sept 2017

International Sanctuary; Irvine, CA

Supervisor: Jackie Kong, Director for Professional Opportunities for Survivors of Trafficking Program (POST)

- Conducted research on various psychology-related topics (self-efficacy, mental health laws, assessments) to help further the development of POST Program

RELEVANT EXPERIENCE

Supervisor for Clinical Foundations Course // Graduate Teaching Assistant (TA)

George Fox University, Newberg, OR

August 2022 – Present

- Course Educator: Carilyn Ellis, PsyD
- Completed multiple hours of training to help lead weekly didactic groups for first year clinical psychology doctoral students through their initial clinical training experiences, reviewing videos of clinical skills and providing constructive feedback

- Graded all clinical reflection assignments and assess students for competency on foundational clinical and writing skills throughout their first-year training progress
- Supervised first year students developing foundational clinical skills and navigating first clinical encounters

Graduate Student Editor**Fall 2021 - Present**

George Fox University; OR

- Provided grammar and APA format edits and constructive feedback on papers submitted by graduate students, including internship essays, research papers, and class assignments, offering a space for additional writing support

Family Therapy in a Diverse Culture // Graduate Teaching Assistant (TA)

George Fox University; OR

Spring 2021 & 2022

- Course Educator: Celeste Jones, PsyD
- Graded and provided feedback on family portfolio assignments and reflections
- Collaborated with professor and other TAs to provide student support and study sessions for exams and projects

Theories of Personality // Graduate Teaching Assistant (TA)

George Fox University; OR

Fall 2020

- Course Educator: Amber Nelson, PsyD
- Facilitated and lead weekly study sessions to review various theories
- Graded and provided feedback on weekly theories charts and quizzes, case conceptualization papers, and theory papers
- Tracked grades and student progress on Excel sheets and Foxtale

Lifespan Development // Graduate Teaching Assistant (TA)

George Fox University; OR

Fall 2020

- Course Educator: Amber Nelson, PsyD
- Graded and provided feedback on critical thinking papers, midterms, and oral finals
- Tracked grades and student progress on Excel sheets and Foxtale

Grad Assistant HR Employee Benefits**Sept 2019- May 2020**

George Fox University; OR

- Verified and updated data into appropriate databases in accurate and timely manner
- Worked closely with the HR Benefits manager to complete timely projects

CERTIFICATIONS

Trauma Treatment Certificate**Fall 2021 – Fall 2022**

- George Fox University
- Dr. Kenneth Logan

Certificate in SBIRT (Screening, Brief Intervention, and Referral to Treatment) for Health and Behavior Health Professionals **February 2022**

- Health Knowledge
- Dr. Heather Gothman

Certificate in Group Psychotherapy **June 2021**

- George Fox University
- Dr. Michele Ribeiro

Certificate in Ecopsychology **May 2021**

- Pacifica Graduate Institute
- retreat@pacific.edu

CPR Certification **2019– Present**

- George Fox University
- Newberg, OR

TeleHealth: Legal & Ethical Issues Certification **August 2020**

- Behavioral Health Center – Therapy Clinic
- Newberg, OR

TeleMental Health Certificate **September 2020**

- Behavioral Health Center – Therapy Clinic
- Newberg, OR

AWARDS, HONORS, AND GRANTS

Diversity Scholarship **Sept 2019 – Present**

George Fox University, OR

- Contributed to multicultural awareness within the program through involvement in clinical and research opportunities working with diverse populations

Primary Care Track Scholarship **Sept 2019 – May 2020**

George Fox University, OR

- Selected students in Primary Care Psychology track given scholarship to aid in unique opportunities for training, research, and academic work during first year of training

Emerson Award **2018-2019**

Biola University, CA

- Yearly recognition for one individual senior who has an outstanding academic record, made significant contributions to department, and shows great promise for future work in field of psychology

Ruby Women Scholarship **2018-2019**

Biola University, CA

- Equipped and engaged women to serve the world in impactful, meaningful way

Dean's List **2015-2018**

Biola University, CA

COMMITTEE LEADERSHIP & MEMBERSHIP**Multicultural Community Leadership Team** **May 2020 – Present**

George Fox University; Newberg, OR

- Collaborated with and participated in meetings with other student leader groups to create activities and events for the whole student body
- Facilitated events on various topics of diversity and provided a safe space for processing and discussion

Student of Color Leadership Team **Oct 2019 – Present**

George Fox University; Newberg, OR

- Engaged in training from cross-cultural speakers
- Provided peer support to students within the team regarding cross-cultural navigation, professional and leadership development

Student Wellness Committee Representative **Sept 2019 – Present**

George Fox University; Newberg, OR

- Facilitated and participated in effective communication between the student body and student council regarding student wellness

Health Student Interest Group (SIG) Member **Sept 2019 – Present**

George Fox University; Newberg, OR

Christian Integration Student Interest Group (SIG) Member **Aug 2020 – Present**

George Fox University; Newberg, OR

PROFESSIONAL TRAININGS AND WORKSHOPS**Ground Rounds || Empowerment to Break Bias Habit: Evidence-based Approaches to Reduce Bias, Create Inclusion, and Promote Equity**

- Presenter: Will Cox, PhD
- Date: October 12, 2022

Ground Rounds || Sex, Religion, & Spirituality in the Therapy Room: Clinical Interventions

- Presenter: Elisabeth Esmiok Wilson, PhD
- Date: March 9, 2022

Colloquium || Intractable Conflict in Families and Society: What do we know about healing the rifts?

- Presenter: Wendy Bourg, PhD
- Date: February 2, 2022

Colloquium || May it be Well with Your Soul: Anti-Racism, Spiritual Freedom, and Wellness

- Presenter: Brandy Liebscher, PsyD; Patser Liz Vaiz
- Date: November 3, 2021

Grand Rounds || Erotic Transcendence: Integrating Faith with What's Next in Sex Research

- Presenter: Elisabeth Esmiok Wilson, PhD
- Date: October 13, 2021

Grand Rounds || Gender Diverse Clients: Therapy and Intervention Readiness Assessments

- Presenter: Chloe Ackerman, PsyD
- Date: March 10, 2021

Colloquium || Saying “Yes” to Your Embodied Life: An Invitation for Psychotherapists

- Presenter: Janelle Kwee, PhD
- Date: January 3, 2021

Colloquium || Complex PTSD: Advanced Case Conceptualization, Assessment and Treatment Approaches in Trauma Populations

- Presenter: Jason Steward, PhD
- Date: November 4, 2020

Grand Rounds || Examining the Role of Neuropsychology within the Pediatric Cancer Setting

- Presenter: Justin Lee, PhD
- Date: October 14, 2020

Focused Acceptance and Commitment Therapy (fACT) Training

- Presenter: Kirk Strosahl, PhD
- Dates: August 13-15, 2020

Mitigating the Effects of ACEs in primary care: Trauma-informed Care

- Presenter: Amy Stoeber, PhD
- Date: February 21, 2020

Grand Rounds || Mitigating the Effects of ACEs (Adverse Childhood Experiences) through Resilience Building and Compassion Connection

- Presenter: Amy Stoeber, PhD
- Date: February 12, 2020

Leadership Conference Workshop & Individual Mentoring Consultation

- Presenter: Kyler Shumway, PsyD & Daniel Wendler, PsyD
- Date: February 1, 2020

Interprofessional Solutions for Treating Depression in Primary Care

- Presenter: Bruce Arroll, PhD & Patricia Robinson, PhD
- Date: January 18, 2020

Colloquium || Intercultural Prerequisites for Effective Diversity Work

- Presenter: Cheryl Forester, PsyD
- Date: October 16, 2019

Colloquium || Promoting Forgiveness

- Presenter: Everett Worthington, PhD
- Date: September 25, 2019

PROFESSIONAL MEMBERSHIPS**Oregon Association for Multicultural Counseling and Development (Oregon AMCD)**

Oct 2020 – Present

American Psychology Association (APA)

Sept 2019 – Present

Leadership Officer for Psi Chi Honor Society

Sept 2017 – Dec 2018

- Created 6 events per semester with the Psi Chi association team on psych-related topics including: Graduate school planning, career exploration, resume building

ASSESSMENT EXPERIENCE**Personality Assessments**

| | |
|---------------|--|
| MMPI-2 | Minnesota Multiphasic Personality Inventory, Second Edition |
| MCMII | Millon Clinical Multiaxial Inventory |
| PAI | Personality Assessment Inventory |
| 16PF | Sixteen Personality Factor Questionnaire |
| RIT | Rorschach Inkblot Test (Observed administration & partook in interpretation) |

Cognitive Assessments

| | |
|----------------|---|
| WAIS-IV | Wechsler Adult Intelligence Scale, Fourth Edition |
| WMS-IV | Wechsler Memory Scale, Fourth Edition |
| WISC-V | Wechsler Intelligence Scale for Children, Fifth Edition |
| CPT-3 | Conners Continuous Performance Test, Third Edition |
| MMSE | Mini-Mental Status Exam |
| RUDAS | Rowland Universal Dementia Assessment Scale |

Adaptive Behavior Assessments

| | |
|---------------|--|
| ABAS-3 | Adaptive Behavior Assessment System, Third Edition |
|---------------|--|

PROFESSIONAL REFERENCES

Available upon request. Please contact me through email nwu19@georgefox.edu to request professional, academic, or personal reference.