

Stephen F. Austin State University

**SFA ScholarWorks**

---

Electronic Theses and Dissertations

---

Winter 12-18-2019

## NATURE RELATEDNESS: INVESTIGATING DIFFERENCES AMONG RURAL, SUBURBAN, AND URBAN POPULATIONS IN CONNECTION TO NATURE SCORES

Elizabeth K. Skinner  
skinner.elizabeth@gmail.com

Follow this and additional works at: <https://scholarworks.sfasu.edu/etds>



Part of the [Environmental Studies Commons](#), and the [Outdoor Education Commons](#)

[Tell us](#) how this article helped you.

---

### Repository Citation

Skinner, Elizabeth K., "NATURE RELATEDNESS: INVESTIGATING DIFFERENCES AMONG RURAL, SUBURBAN, AND URBAN POPULATIONS IN CONNECTION TO NATURE SCORES" (2019). *Electronic Theses and Dissertations*. 328.

<https://scholarworks.sfasu.edu/etds/328>

This Thesis is brought to you for free and open access by SFA ScholarWorks. It has been accepted for inclusion in Electronic Theses and Dissertations by an authorized administrator of SFA ScholarWorks. For more information, please contact [cdsscholarworks@sfasu.edu](mailto:cdsscholarworks@sfasu.edu).

---

# NATURE RELATEDNESS: INVESTIGATING DIFFERENCES AMONG RURAL, SUBURBAN, AND URBAN POPULATIONS IN CONNECTION TO NATURE SCORES

## Creative Commons License



This work is licensed under a [Creative Commons Attribution-Noncommercial-No Derivative Works 4.0 License](https://creativecommons.org/licenses/by-nc-nd/4.0/).

NATURE RELATEDNESS: INVESTIGATING DIFFERENCES AMONG RURAL,  
SUBURBAN, AND URBAN POPULATIONS IN CONNECTION TO NATURE  
SCORES

By

ELIZABETH KATHERINE SKINNER, Bachelor of Arts

Presented to the Faculty of the Graduate School of Stephen F. Austin State

University

In Partial Fulfillment

Of the Requirements

For the Degree of

Master of Science in Resource Communication

ARTHUR TEMPLE COLLEGE OF FORESTRY AND AGRICULTURE

STEPHEN F. AUSTIN STATE UNIVERSITY

December 2019

NATURE RELATEDNESS: INVESTIGATING DIFFERENCES AMONG RURAL,  
SUBURBAN, AND URBAN POPULATIONS IN CONNECTION TO NATURE  
SCORES

By

ELIZABETH KATHERINE SKINNER, Bachelor of Arts

APPROVED:

---

Dr. Pat Stephens Williams, Committee Chair

---

Dr. Shelby Gull Laird, Committee Member

---

Dr. Ray Darville, Committee Member

---

Pauline M. Sampson, Ph.D.  
Dean of Research and Graduate Studies

## ABSTRACT

The study examined the Nature Relatedness scores of people from rural, suburban, and urban populations to investigate differences among these populations. Survey participants also reported on whether or not they were currently raising children under the age of 18 in their home, how many outdoor activities they participated in as children and currently as adults, and their hours of screen time per day. These variables were examined to measure their impact on Nature Relatedness scores. Results showed significant differences in the Nature Relatedness scores of people from rural and urban, and urban and suburban populations. This study found that people who are currently raising children under the age of 18 had a lower Nature Relatedness score compared to people who are not raising children. People who participated in a high diversity of outdoor activities as children, and people who participated in more outdoor activities as adults, also showed a stronger connection to nature.

*keywords:* connection to nature, nature relatedness, outdoor activities, screen time, national park service

## TABLE OF CONTENTS

|  |     |
|--|-----|
| ABSTRACT   | iii |
| CONTENTS   | iv  |
| LIST OF FIGURES  | vi  |
| LIST OF TABLES   | vii |
| CHAPTER 1: INTRODUCTION  | 1   |
| Research Objectives  | 3   |
| CHAPTER 2: LITERATURE REVIEW                                   | 5   |
| Defining Connection to Nature                                  | 5   |
| Measuring Connection to Nature                                 | 6   |
| Benefits of Connection to Nature                               | 8   |
| Education Impact of Connection to Nature                       | 11  |
| Impact of Parental Beliefs on Connection to Nature in Children | 11  |
| CHAPTER 3: METHODS   | 15  |
| Instrument   | 15  |
| Sampling   | 19  |
| Quantitative Data Analysis                                     | 22  |
| Qualitative Data Analysis                                      | 22  |
| CHAPTER 4: RESULTS   | 23  |
| Demographic Characteristics                                    | 25  |
| Results of Research Objectives                                 | 30  |

|  |     |
|--|-----|
| Type of Environment When Growing Up  | 30  |
| Impact of Parenthood on Nature Relatedness Scores                                  | 34  |
| Impact of Participation in Outdoor Activities on Nature<br>Relatedness Scores      | 36  |
| Impact of Outdoor Activities During Childhood on Nature<br>Relatedness Scores      | 39  |
| Impact of Screen Time on Nature Relatedness Scores                                 | 42  |
| Open Ended Question  | 45  |
| CHAPTER 5: DISCUSSION  | 53  |
| Limitations  | 59  |
| Suggestions for Additional Research  | 61  |
| Conclusion   | 62  |
| REFERENCES   | 63  |
| APPENDIX A – SURVEY INSTRUMENT   | 71  |
| APPENDIX B – UNEDITED OPEN ENDED QUESTION RESPONSES                                | 95  |
| APPENDIX C - Differences Among Sample Groups: Snowball,<br>Park Service, and MTurk | 126 |

## LIST OF FIGURES

|   |    |
|---|----|
| Figure 1: Nature Relatedness scores of people from rural areas  | 32 |
| Figure 2: Nature Relatedness scores of people from suburban areas   | 33 |
| Figure 3: Nature Relatedness scores of people from urban areas  | 34 |
| Figure 4: Nature Relatedness scores of people raising children  | 35 |
| Figure 5: Nature Relatedness scores of people not raising children  | 36 |
| Figure 6: Number of outdoor activity types participants currently<br>experience   | 37 |
| Figure 7: Nature Relatedness scores of people who currently<br>participate in 8 or more types of outdoor activities       | 38 |
| Figure 8: Nature Relatedness scores of people who participate<br>in 7 or fewer types of outdoor activities currently      | 39 |
| Figure 9: Number of outdoor activities participants experienced<br>as a child   | 40 |
| Figure 10: Nature Relatedness scores of people who participated<br>in 16 or more types of outdoor activities as children  | 41 |
| Figure 11: Nature Relatedness scores of people who participated in 15<br>or fewer types of outdoor activities as children | 42 |

## LIST OF TABLES

|   |    |
|---|----|
| Table 1: Survey Results by Group  | 24 |
| Table 2: Differences in Mean Nature Relatedness Scores Among<br>the Three Samples             | 25 |
| Table 3: Self-Identified Race of Survey Respondents   | 26 |
| Table 4: Age of Survey Participants   | 27 |
| Table 5: Highest Education Level Achieved by Survey Participants                              | 28 |
| Table 6: Current Marital Status of Survey Participants  | 28 |
| Table 7: Gender of survey participants  | 29 |
| Table 8: Frequency of Survey Participants Who Are Currently Raising<br>Children Under 18      | 29 |
| Table 9: Comparison of Mean Nature Relatedness Scores based on<br>Type of Hometown            | 31 |
| Table 10: Amount of Self-Reported Screen Time During a Typical<br>Weekend (Saturday – Sunday) | 43 |

Table 11: Nature Relatedness mean scores compared to screen time during a typical weekend (Saturday – Sunday) 44

Table 12: Amount of self-reported screen time during a typical work week (Monday – Friday) 45

Table 13: Nature Relatedness mean scores compared to screen time on weekdays (Monday-Friday) 45

## CHAPTER 1

### Introduction

In the late 1970's R. C. Moore began studying children's experiences with "rough ground" or places where children could manipulate the environment: vacant lots, unmown grass, weedy areas, unpruned trees, water edges, and patches of woods (Chawla, 2015; Moore, 1980). These were areas out of view of adult supervision where children could work creatively to build their own favorite places. He described these places as learning environments where children could experience the environment alone or with friends and, by manipulating and changing the environment, they could gain environmental knowledge and awareness. In the late 1970s, the era of smartphones, YouTube, and virtual reality had not yet begun, but, looking toward the future, Moore cautioned "children who live exclusively in a secondary media environment inevitably pose a threat to the future of the planet because such images substitute vague dreams for those intuitive values that can only be acquired by life experiences of the biosphere" (Moore, 1980, p. 21).

The United States in 2019 looks a lot like the future Moore envisioned, in which adults and children experience a severe disconnection with the natural world, a state of affairs which may be contributing to the planet's destruction (Dutcher, Finley, Luloff & Johnson, 2007; Mayer & Frantz, 2004; Nisbet, Zelenski,

& Murphy, 2009; Schultz, 2001). Humans are currently living beyond the available resources in the world (Kitzes et al., 2008). Many people do not understand even basic concepts about how the Earth supports human life, such as where their water comes from, how food is grown, and their individual impact on the environment. The idea that humans exist as part of nature and are even dependent on that relationship for mental and physical health benefits is not a new one; as Thoreau described, humans are “part and parcel with nature” (Thoreau, 1851). However, efforts to measure one’s relationship with nature have only begun in the past 30 years, beginning with the publication of E. O. Wilson’s *Biophilia Hypothesis* (1984). Biophilia is a term developed to describe the human need to experience nature and an innate, evolved attraction toward life and other life forms.

An individual’s connection to nature is a predictor variable for pro-environmental attitudes and behaviors (Mayer & Frantz, 2004; Nisbet et al., 2009; Dutcher et al., 2007; Clayton, 2003). Several tools have been developed by scholars to measure an individual’s connection with nature. Assumptions commonly are made that individuals from urban populations are less connected to nature than rural populations, though research quantifying this difference is limited. In the United Kingdom, using a representative sample of 1,200 children between the ages of eight and twelve years, researchers tested the assumption that urban children are more disconnected from nature than rural children (Royal Society for the Protection of Birds, 2013). The results were surprising, suggesting

that urban children had a slightly stronger connectedness to nature than did the rural children.

This research examined the literature for varying definitions of nature connection, scales used to measure connectedness to nature, and implications of the degree of connectedness for future generations. The accompanying research examines differences in Nature Relatedness scores between participants from rural, suburban, and urban populations, as well as between participants with and without children. The influence of time spent outdoors versus time spent with electronics was analyzed. This research investigated whether assumptions about rural, suburban, and urban connectedness to nature are true, and provides insight into how current generations of parents are raising their children in regard to connectedness to nature, screen time, and time spent outdoors.

### Research Objectives

The objectives of this study are as follows:

- 1) Determine if there are significant differences in Nature Relatedness scores among people from rural, suburban, and urban areas.
- 2) Identify any significant differences in Nature Relatedness between people with children in their home under the age of 18 and people who do not have minor children in their home.

- 3) Determine if there are significant differences in the Nature Relatedness scores of people who participate in many outdoor activities and those who do not.
- 4) Determine if there are significant differences in the Nature Relatedness scores of people who participated in many outdoor activities as children and those who did not.
- 5) Determine if there are significant differences in the Nature Relatedness scores of people who report higher levels of screen time compared to people who report lower levels of screen time.

## CHAPTER 2

### Literature Review

#### Defining Connection to Nature

There are various terms to describe nature connection in the literature, including connectedness to nature, nature relatedness, environmental identity, connectivity with nature, commitment to nature, inclusion of nature in the self, and more. The component parts of connection to nature include enjoyment of nature, empathy for other living things, sense of oneness, and a sense of responsibility (Cheng & Monroe, 2012). Mayer and Frantz (2004) define connectedness to nature simply as “feeling emotionally connected to the natural world.” Nisbet et al. (2009) define nature relatedness as “one’s appreciation for and understanding of our interconnectedness with all other living things on earth.” Clayton (2018) defines environmental identity as a stable sense of oneself as connected to the natural world. Theimer and Ernst (2012) defined connectedness to nature as an “emotional connection or affinity to the natural world.” Dutcher et al. (2007) define connectivity with nature as a perception of sameness between the self, others, and the natural world. These varying definitions ultimately describe the same concept: a connection or relatedness of the individual with the natural environment. For the purposes of this research, the terms nature relatedness and nature connection will be used interchangeably.

## Measuring Connection to Nature

In the past 30 years, researchers have developed instruments to attempt to measure the human connection to nature. Kals, Schumacher, and Montada (1999) authored a paper on the concept of emotional affinity toward nature (EATN) which included a 16-item scale to gauge emotional inclinations toward nature, love for nature, and feeling of one-ness with nature. The Connectedness to Nature scale, or CTN, is a 14-item scale that measures the extent to which people feel actively connected to nature and feel a sense of belonging in a natural community (Meyer & Frantz, 2004). Results of research showed that CTN is a predictor of environmentally responsible behavior such as recycling, buying organic produce, volunteering, and choosing lower-carbon methods of transportation such as cycling. Both EATN and CTN are measures of emotions, as opposed to the cognitive aspect of connectedness to nature (Tam, 2013). The cognitive aspects of nature connection include beliefs and understandings about environmental problems. Not all measures are scaled questionnaires. Schultz (2001) created the *inclusion of nature in the self* (INS) graphical measure with overlapping circles, one titled “self” and the other titled “nature,” in which participants select the degree of overlap that most represents their relationship with nature. Their results found a positive relationship between high ratings of overlap between the self and nature and environmental concern.

Davis, Green, and Reed (2009) published the *commitment to nature* (COM) scale, an 11-item scale based on Rusbult’s (1980, as cited in Davis,

Green & Reed, 2009) interdependence theory that greater dependence on a relationship partner will lead to a feeling of greater commitment toward the partner. Substituting “nature” for the relationship partner, they found that higher levels of commitment to the environment, and greater inclusion of nature in the self, predicted higher levels of pro-environmental behavior. The four scales described above are unidimensional in that they measure one specific aspect of an individual’s connection to nature (Tam, 2013).

Examples of multi-dimensional scales include Clayton’s (2003) *environmental identity* scale (EID) which measures a sense of connection to the non-human natural environment and the belief that the environment is important. Environmental identity is measured on a 24-item scale that covers multiple dimensions including interaction with natural elements, importance of nature, importance of membership in nature, and positive emotions toward nature. EID has been shown to be a predictor of environmental concern and behavior (Gifford and Nilsson 2014; Clayton, 2003).

Dutcher and colleagues (2007) created the *connectivity with nature* (CWN) scale. They define CWN as “people’s perception of a fundamental sameness between oneself and the natural world” as measured by five items, which include the graphical measure from the inclusion in nature (INS) scale, described above. This measure was found to be predictive of environmental concern and ecological behavior, but the reliability of the scale, while acceptable, was relatively low ( $\alpha = .72$ ).

Nisbet, Zelenski and Murphy (2009) created another multidimensional scale, the *nature relatedness* scale (NR), that focuses on three aspects of the concept: affective (e.g., emotional affinity for nature), cognitive (e.g., interest in nature), and experiential. Nature relatedness captures one's identification with nature, nature-related worldviews, familiarity with nature, comfort with nature, and desire to be in nature. A higher score on this scale was found to be predictive of love for animals, membership in environmental organizations, self-identification as an environmentalist, and preference for green products (Nisbet et al., 2009; Tam, 2013). Though all of the scales described above place an emphasis on different aspects of connectedness to nature, they all measure the relationship between an individual and the natural world. For the purposes of this study, the Nature Relatedness Scale (Nisbet et al., 2009) will be used. This scale was selected because it is a multidimensional scale and was found to have satisfactory validity (Cronbach's alpha of .87).

### Benefits of Connection to Nature

The lack of a connection to nature is commonly referred to as nature deficit disorder, a term coined by Richard Louv in his book, *The Last Child in the Woods* (Louv, 2005). He describes nature deficit disorder as the "human costs of alienation from nature, among them: diminished use of the senses, attention difficulties, and higher rates of physical and emotional illnesses" (2005, p.36). Louv focuses on the impacts of nature deficit disorder on children, though the same concepts can be applied to adults (Bowler, Buyung-Ali, Knight, & Pullin,

2010). The fourth graders Louv interviewed for his research in the early 2000s are now adults, some of whom may be raising children of their own.

Until recent years, most children have been introduced to the natural world through unstructured outdoor play in areas surrounding the home, including the “rough ground” areas described by Moore (1980). The current generation of children are coming of age in a world vastly different from that of their parents and grandparents. With up to eight hours of screen time each day on various devices (Rideout, Foehr, & Roberts, 2010), but limited access to the outdoors, many children are suffering from nature deficit disorder (Louv, 2005) and experiencing the world in a secondary media environment (Moore, 1980). This disconnection does not only affect urban and suburban children. A recent study (Larson, Szczytko, Bowers, Stephens, Stevenson, & Floyd, 2018) found that rural youth spend more time with electronic media than they do outdoors, and the difference was more pronounced for girls, especially girls of color.

A review of the literature shows significant benefits to the physical and mental health of children and adults who spend time in nature. Connection to nature has hedonic and eudemonic benefits (Tam, 2013). The hedonic benefits of nature include happiness, pleasantness of emotions, and increased well-being. The eudemonic benefits include self-realization, sense of purpose in life, personal growth, autonomy, and vitality (Ryan & Deci, 2001). In one study, elementary school students with attention deficit disorder (ADD) who spent just 20 minutes in nature experienced the same increase in ability to concentrate that

is normally experienced after a dosage of ADD medication (Faber, Taylor, & Kuo, 2009). Exposure to nature for children results in higher test scores, better self-discipline, and less likelihood to display symptoms of attention deficit hyperactivity disorder (ADHD) (Seltnerich, 2015).

Experience in natural environments can not only help mitigate stress but can also help prevent stress through its ability to help increase attention. (Kaplan, 1995). One of the benefits of time spent in nature is the different way humans focus their attention in the natural world as compared to in a built environment. Being in nature includes being away from one's usual environment, a soft fascination, and a sense of extent, and compatibility with the natural world. Extent is a feeling that can be found in a large, expansive natural area, or even in the presence of historic or cultural artifacts, as these experiences "can promote a sense of being connected to past eras and past environments and thus to a larger world" (Kaplan, 1995, p. 174). Compatibility describes the ease with which many people function in a natural setting, even though they have more familiarity with "civilized" settings (Kaplan, 1995). People who spend time in nature perform better on attention-intensive tasks (Hartig, Mang, & Evans, 1991). Time in the outdoors reduces anger, fatigue, and sadness, and has positive impacts on energy levels and attention (Bowler et. al., 2010). Children who can engage in unstructured outdoor play have better problem-solving skills, social relationships, and emotional well-being (Burdette & Whitaker, 2005).

The physical health benefits of time spent in nature are numerous, including lower blood pressure, lower stress levels, faster recovery from illness and injury, and less anxiety (Frumkin, 2001; Hartig, Mang, and Evans, 1991; Ulrich, 2002). Children today may have two to five years shorter life spans than their parents because of inactive lifestyles (Ludwig, 2007). A full discussion of the health benefits of time spent in nature is beyond the scope of this study.

#### Education Impact of Connection to Nature

If children who spend time in nature have a greater ability to focus their attention and regulate their emotions, a logical conclusion is that more time outdoors will result in better academic achievement. It is estimated that students ages eight to 18 in the United States spend eight hours per day looking at screens, seven days per week, all year-round. Fifty-one percent of students who reported themselves as heavy media users received good grades; comparatively, light media users receive high grades at a rate of 66% (Rideout, Foehr, & Roberts, 2010). Children demonstrate more inventiveness and creativity when exposed to a larger number of environmental variables (Ramey, Campbell, & Nicholson, 1973). These studies suggest that spending time outdoors and away from technology could result in better grades.

#### Impact of Parental Beliefs on Connection to Nature in Children

Research has shown that parental attitudes toward nature can influence children's attitudes and vice versa (Dunton, et al., 2010; Greer et al., 2017). A child's attitude regarding physical activity is influenced by the attitudes of their

parents (Greer, Castrogivanni, & Marcello, 2017). In an Australian study investigating children's choices about where to play, parents who described their kid as an "indoor kid" versus as an "outdoor kid" had children who were less active outdoors (Veitch, Bagley, Ball, & Salmon, 2007). This may be a reflection of the parents' attitudes and beliefs, causing the child to be less active. Children are more likely to be physically active if their parents are physically active (Dunton, Liao, Almanz, 2012). Parental role modeling is positively associated with moderate to vigorous intensity physical activity in children (Cleland et al., 2011). Parental attitudes are an important factor in how much outdoor play a child can participate in, thus impacting their children's connection to nature.

Gauging parental attitudes toward nature now could help predict how the next generation will feel about nature. Adults who participated in more nature-based activities as children were found to be more likely to overcome barriers to participation as adults and spent more time in nature as adults (Asah, Bengston, and Westphal, 2012). However, an Australian study on parental experiences in nature showed that few parents are providing the same opportunities they had as children to have unstructured, unsupervised time in nature for their children, even though they benefited from such experiences (Laird, Piazza, & Allen, 2014). Even parents with positive attitudes toward nature are not allowing their children to play outdoors, suggesting that a construct other than parental attitudes toward nature is preventing parents from allowing their children to have experiences outdoors (McFarland, Zajicek, & Waliczek, 2014). Asah et al. (2012) described

how a more representative sample of adults from the general public could help increase understanding of how different nature exposure mechanisms in childhood can predict environmental citizenship behaviors and commitment to nature-based activities in adulthood.

Richard Louv's research into nature deficit disorder looked at unstructured outdoor play, similar to the type of play he engaged in as a child in the woods near his housing development (Louv, 2005). In a 2010 study of urban parents, 19% would not let their children play outside at all (Kalish, Banco, Burke & Lapidus, 2010). Parental concerns included traffic, rundown parks, crime, witnessing violence, being a victim of violence, drugs, and gangs. In the study, parents who were Spanish speakers were less likely than English speakers to let their children play outside. Research into access to urban greenways found that minorities have less access to trails and greenways in cities (Lindsey, Maraj, & Kuan, 2001), and people with lower incomes use recreation facilities less than others (Shaw, Bonen, & McCabe, 1991). Based on such research, it could be assumed that urban populations would have lower scores on a nature-relatedness scale.

Yet, research from outside of the United States shows that individuals in urban populations are capable of having a significant personal connection to the natural world. In the Netherlands, a nationwide study found that 95% of participants believe that a visit to nature is a way to relieve stress (Frerichs, 2004 as cited in Van Den Berg, Hartig, & Staats, 2007), and a survey from the United

Kingdom Royal Society for the Protection of Birds (2013) found that urban children were slightly more connected to nature than rural children. The children were given an instrument with 16 statements to calculate a connection-to-nature index developed by Cheng and Monroe (2012). On the questionnaire, the children indicated their level of agreement to questions like “humans are part of the natural world,” “being in the natural environment makes me feel peaceful,” and “I enjoy touching animals and plants.” The results of the study were surprising to researchers: urban children had slightly higher scores than rural children, suggesting urban children have a stronger connection to nature than children from rural populations. Further studies are needed to confirm these results.

## CHAPTER 3

### Methods

This paper reports research designed to uncover the relationship among these different variables: rural, urban, and suburban settings; parental attitudes and behavior; childhood outdoor activities; current involvement with outdoor activities; screen time; and nature relatedness scores among adult residents of the United States. The overall research question is: which variables affect nature relatedness scores?

#### Instrument

The research instrument is composed of four different parts (see Appendix A). The first part is the 21 item Nature Relatedness Scale (Nisbet et al., 2009). The Nature Relatedness Scale (NR) was selected as a component of this instrument because results supported the instrument authors' hypothesis that people with high nature-relatedness scores spend more time outdoors and have higher scores on measures of environmentally responsible behaviors and attitudes (Nisbet et al., 2009). The NR significantly predicts indicators of eudemonic well-being like personal growth, purpose in life, and positive relationships with others (Nisbet et al., 2011). The NR questionnaire is a self-report measure that assesses the affective, cognitive, and physical relationship an individual has with the natural world. It uses a 5-point Likert scale, ranging

from 1 (disagree strongly) to 5 (strongly agree), to indicate how well each statement describes one's self; a higher score demonstrates a stronger connection to nature. Statements phrased in the negative were reverse scored. The 21 items in the questionnaire can be organized into three factors: NR-Self, NR-Perspective, and NR-Experience. The overall questionnaire was evaluated for validity and had a Cronbach's alpha of .87. The three internal factors can be evaluated separately, with Cronbach's alphas of .84 (NR-Self), .66 (NR-Perspective), and .80 (NR-Experience).

NR-Self is a measure of the ecological self, reflecting one's internal thoughts and feelings about nature. Questions in this section are:

1. My connection to nature and the environment is a part of my spirituality.
2. My relationship to nature is an important part of who I am.
3. I feel very connected to all living things and the earth.
4. I am not separate from nature, but a part of nature.
5. I always think about how my actions affect the environment.
6. I am very aware of environmental issues.
7. I think a lot about the suffering of animals.
8. Even in the middle of the city, I notice nature around me.
9. My feelings about nature do not affect how I live my life.

The second factor is NR-Perspective, which indicates the respondent's external attitudes about their personal relationship with nature, including how their actions impact other living things. These questions are:

10. Humans have the right to use natural resources any way we want.
11. Conservation is unnecessary because nature is strong enough to recover from any human impact.
12. Animals, birds and plants have fewer rights than humans.
13. Some species are just meant to die out or become extinct.
14. Nothing I do will change problems in other places on the planet.
15. The state of nonhuman species is an indicator of the future for humans.

The third and final factor is NR-Experience, which reflects one's physical familiarity with nature, their level of comfort in nature, and their attraction to be in nature. These questions are:

16. The thought of being deep in the woods, away from civilization, is frightening.
17. My ideal vacation spot would be a remote, wilderness area.
18. I enjoy being outdoors, even in unpleasant weather.
19. I don't often go out in nature.
20. I enjoy digging in the earth and getting dirt on my hands.
21. I take notice of wildlife wherever I am.

The second part of the instrument gathered sociodemographic data including: gender, age category, ethnicity, level of education, and whether or not the respondent is raising children under the age of 18 in the home. Respondents were asked to choose between rural, suburban, and urban to describe the environment of their hometown. Data were collected on respondents' current level of participation in outdoor activities and the type of activities they participate in, as well as the types of activities and level of participation they had as children.

The third portion of the instrument gathered information on screen time and outdoor time, both for present day and for childhood. Participants were asked to estimate the number of hours they spent looking at a screen each day on average in the past week and report an estimate of screen time during their own childhood. Participants were asked to provide estimates for regular work days and for non-work days currently, and for school days versus non-school days as children. For participants rearing children under the age of 18, an additional set of questions asked parents/caregivers to report the number of hours their child/ren spend(s) looking at screens, on school days versus non-school days, and the number of hours their child spends outdoors for school days versus non-school days. The options for responses were:

- None (0 hr per day).
- Less than 0.5 hr per day.
- Between 0.5 hour and 1 hour per day.
- 1 - 2 hours per day.
- 2 - 3 hours per day.
- 3 - 4 hours per day.
- 4 - 5 hours per day.
- 5 or more hours per day.

The fourth and final component of the questionnaire was a series of questions about the respondent's attitude toward spending time outdoors. These questions were: "Do you want to be more 'outdoorsy' but can't find time?"; "How often do you visit State/National Parks?"; "Do you make time to go outdoors?"; and "Are you physically able to spend time outdoors?" This section culminated in an open-ended question, "Is there anything else you would like to tell us about spending time outdoors?" This added a qualitative component to the survey and was an optional response.

### Sampling

In 1946, the statistician and psychologist Quinn McNemar lamented that the "existing science of human behavior is largely the science of sophomores" (1946, p. 333). Indeed, much of the research reviewed for this study was conducted on populations of college students. For the present research, three samples were collected: one using the snowball approach with an online questionnaire shared with friends, colleagues, and family via Qualtrics; a second sample was

comprised of National Park Service employees; and a third using Amazon's Mechanical Turk, or MTurk, an online tool to crowd-source data collection. The snowball technique is a non-probability sampling technique where existing subjects recruit future subjects; in this case, participants shared the link via social media and email. The approved research proposal for the present study included only two samples: one snowball sample and one collected via Amazon MTurk. Originally, the researcher planned to collect a few responses from a National Park Service employees' Facebook group, which would become part of the snowball sample. However, the survey link was shared the week of December 27, 2018, the beginning of the government shutdown that lasted from December 22, 2018 – January 25, 2019—a record 35 days. A large number of responses were received—over 700 responses; 608 of these responses were complete and used in this analysis. To avoid skewing the data, responses from the National Park Service employees were isolated into their own sample group; the resulting data were analyzed separately for validity and compared to the MTurk results and the snowball sample. This was done out of concern that park service employees could have a higher nature relatedness score than the general population, due to their more frequent contact with nature and chosen professions. The park service group also included NPS interns and volunteers. Not all NPS employees are park rangers; this sample included maintenance mechanics, administrators, human resource professionals, and other office-based workers.

The snowball questionnaire was shared online via social networks using a different URL than the NPS employee survey, with a total of 347 responses, 300 of which were complete. The completion of the questionnaire was anonymous and voluntary. The time to complete the questionnaire was approximately 10 minutes. Data were collected for a period of one month, from December 27, 2018 to January 27, 2019.

Data collected via Amazon's online tool MTurk have been found to be at least as reliable as data collected from traditional methods, and respondents are significantly more diverse than American college samples and slightly more demographically diverse than standard internet samples (Buhrmester, Kwang, & Gosling, 2011).

The target sample size was 601 for the MTurk questionnaire, based on the Qualtrics Sample Size calculator (Qualtrics, 2018) for a population of 250 million adults over the age of 18 in the United States, with a 95% confidence interval and 4% margin of error. The survey link was activated on Amazon MTurk on December 27, 2018, at 2:48 pm, with an incentive of \$1.00 for participants who completed the task. By 4:27 pm on December 27, 2018, only one hour and thirty-nine minutes after the survey was launched, 624 responses had been recorded. The survey was closed at this point. Six hundred and eight responses were complete and used for analysis in this study.

### Quantitative Data Analysis

Data from the surveys were coded and analyzed using IBM SPSS Statistics Version 25. To determine the significance of tested variables in inferential tests, alpha was set at .05. Robert Szafran's book, *Answering Questions with Statistics* (2012), provided guidelines for statistical analysis methods and for evaluating the strength of statistical relationships. In addition to general analysis of the entire sample, the snowball sample, National Park employees' sample, and the sample from MTurk were analyzed separately to investigate differences in the sampling methods.

### Qualitative Data Analysis

The qualitative responses were analyzed using guidelines from Research Design (2014, p. 197) by John W. Creswell. The responses were reviewed and then coded. Codes were not pre-determined and were allowed to emerge during the analysis. The qualitative portion of the study was based on constructivism, as the researchers are seeking to understand the complexity of the views and not reduce them. The qualitative portion included a broad, open ended question in order to seek varied meanings and understandings. The researcher acknowledged that her own meanings and beliefs shaped the interpretation of the results and attempted to acknowledge these effects on the research. Data were collected in a convergent parallel manner, in that the quantitative and qualitative data were collected at the same time, and not in separate phases.

## CHAPTER 4

### Results

As stated in Chapter One, the study reported here examined in detail the Nature Relatedness scores of residents of the United States as well as factors that may impact Nature Relatedness, including the type of environment participants lived in when growing up, time spent outdoors, time spent looking at screens, whether or not they are raising children, and the variety of outdoor activities they participated in as children. This chapter is organized in terms of the five specific research objectives detailed in Chapter 1. It begins with a summary of the demographics of the sample, then it reports differences in Nature Relatedness scores from people in rural, suburban, and urban settings. This is followed by describing differences between parents and non-parents; people who participated in many outdoor activities as children versus those who did not; people who participate in many outdoor activities now versus fewer activities; and differences between people who report high levels of screen time and those who report lower levels of screen time.

As noted in Chapter Three, the researcher utilized three sampling efforts to measure Nature Relatedness scores. These included a “snowball” sample, a sample of current and former National Park Service employees, and a sample of

the general population via Amazon Mechanical Turk. Of the 1,514 responses, 608 or 40.2% came from the Amazon MTurk sample, 606 or 40% came from the park service employees' sample, and 300 or 19.9% were from the snowball sample conducted by the researchers. Table 1 summarizes these figures.

Table 1

*Survey Results by Group*

|                | Frequency | Percent | Valid Percent | Cumulative Percent |
|----------------|-----------|---------|---------------|--------------------|
| Valid Snowball | 300       | 19.8    | 19.8          | 19.8               |
| ParkService    | 606       | 40.0    | 40.0          | 59.8               |
| MTurk          | 608       | 40.2    | 40.2          | 100.0              |
| Total          | 1514      | 100.0   | 100.0         |                    |

The three samples are combined into one large sample of 1,514 participants, much larger than the intended sample size of 601. Differences between the samples were analyzed, but in consultation with committee members the results summarized here are based on all 1,514 cases. There were variations in demographics between the three samples, but the most significant difference was in Nature Relatedness mean scores. Respondents in the Amazon sample had the lowest NR mean scores, and the Park Service sample had the highest mean NR scores. Table 2 summarizes these results. The differences between the sample groups are discussed in Appendix C.

Table 2

*Differences in Mean Nature Relatedness Scores Among the Three Samples*

| Group        | Mean   | N    | Std. Deviation |
|--------------|--------|------|----------------|
| Snowball     | 4.1871 | 300  | .54842         |
| Park Service | 4.3307 | 606  | .46805         |
| AmazonMTurk  | 3.6060 | 608  | .66104         |
| Total        | 4.0112 | 1514 | .65980         |

ANOVA (F=264.770, df= 2 and 1511, p < .0005)

### **Demographic Characteristics**

Participants were asked to self-identify their race. Of the 1,514 surveys, 84.2% were from people who identified as white, with very few minority responses (Table 3). Only 4.4% of participants identified as Asian, 3.4% indicated Native American, and 3% identified as black. Percentages reported in Table 3 do not include non-responders.

Table 3

*Self-Identified Race of Survey Respondents*

|       |                                  | Frequency | Percent | Valid Percent | Cumulative Percent |
|-------|----------------------------------|-----------|---------|---------------|--------------------|
| Valid | White/Non-Hispanic               | 1239      | 81.8    | 84.2          | 84.2               |
|       | Other                            | 70        | 4.6     | 4.8           | 89.0               |
|       | Asian                            | 64        | 4.2     | 4.4           | 93.3               |
|       | American Indian/Alaska Native    | 50        | 3.3     | 3.4           | 96.7               |
|       | Black/African American           | 44        | 2.9     | 3.0           | 99.7               |
|       | Native Hawaiian/Pacific Islander | 4         | .3      | .3            | 100.0              |
|       | Total                            | 1471      | 97.2    | 100.0         |                    |
|       | Missing                          | No Answer | 43      | 2.8           |                    |
| Total |                                  | 1514      | 100.0   |               |                    |

When asked specifically if they were Hispanic, only 3.4% or 52 individuals reported they were Hispanic. The overwhelming majority said they were non-Hispanic, with 1,462 responses or 96.6%.

The median age category was 30-39 years, with 29.9% of responses, followed by 18-29 year-olds, with 24%. The smallest category was from participants between the ages of 50-59 years with only 15 responses or 4.2% cumulatively; 72% of responses were from people 49 years of age or younger. This data is summarized in Table 4.

Table 4

*Age of Survey Participants*

|         |                   | Frequency | Percent | Valid Percent | Cumulative Percent |
|---------|-------------------|-----------|---------|---------------|--------------------|
| Valid   | 18-29             | 363       | 24.0    | 24.0          | 24.0               |
|         | 30-39             | 452       | 29.9    | 29.9          | 53.9               |
|         | 40-49             | 273       | 18.0    | 18.1          | 72.0               |
|         | 50-59             | 215       | 14.2    | 14.2          | 86.2               |
|         | 60-69             | 176       | 11.6    | 11.6          | 97.9               |
|         | 70 years or older | 32        | 2.1     | 2.1           | 100.0              |
|         | Total             | 1511      | 99.8    | 100.0         |                    |
| Missing | No answer         | 3         | .2      |               |                    |
| Total   |                   | 1514      | 100.0   |               |                    |

Participants were generally well educated with 71.5% of participants having a college degree or higher, and many having advanced degrees. Of all participants, 465 or 30.8% had a graduate certificate or above. Only 8.5% or 129 people had received only a High School Diploma or GED. These findings are summarized in Table 5.

Table 5

*Highest Education Level Achieved by Survey Participants*

|         |                                    | Frequency | Percent | Valid Percent | Cumulative Percent |
|---------|------------------------------------|-----------|---------|---------------|--------------------|
| Valid   | High School Diploma or GED         | 129       | 8.5     | 8.5           | 8.5                |
|         | Associate's Degree or Some College | 287       | 19.0    | 19.0          | 27.5               |
|         | College Degree                     | 616       | 40.7    | 40.7          | 68.3               |
|         | Graduate Certificate or Degree     | 465       | 30.7    | 30.8          | 99.0               |
|         | Other                              | 15        | 1.0     | 1.0           | 100.0              |
|         | Total                              | 1512      | 99.9    | 100.0         |                    |
| Missing | No answer                          | 2         | .1      |               |                    |
| Total   |                                    | 1514      | 100.0   |               |                    |

Exactly half of the responses were from married people, as seen in Table

6.

Table 6

*Current Marital Status of Survey Participants*

|         |           | Frequency | Percent | Valid Percent | Cumulative Percent |
|---------|-----------|-----------|---------|---------------|--------------------|
| Valid   | Single    | 728       | 48.1    | 48.2          | 48.2               |
|         | Married   | 755       | 49.9    | 50.0          | 98.1               |
|         | Widowed   | 28        | 1.8     | 1.9           | 100.0              |
|         | Total     | 1511      | 99.8    | 100.0         |                    |
| Missing | No answer | 3         | .2      |               |                    |
| Total   |           | 1514      | 100.0   |               |                    |

Participants were asked to report their gender. Most responses were from women (65.8%), followed by men (33.7%) and a very small minority (0.5%) selected Other. Table 7 below summarizes these results.

Table 7

*Gender of survey participants*

|         |           | Frequency | Percent | Valid Percent | Cumulative Percent |
|---------|-----------|-----------|---------|---------------|--------------------|
| Valid   | Male      | 510       | 33.7    | 33.7          | 33.7               |
|         | Female    | 995       | 65.7    | 65.8          | 99.5               |
|         | Other     | 8         | .5      | .5            | 100.0              |
|         | Total     | 1513      | 99.9    | 100.0         |                    |
| Missing | No answer | 1         | .1      |               |                    |
| Total   |           | 1514      | 100.0   |               |                    |

A majority of participants were not currently raising any children under the age of 18 in the home, shown in Table 8.

Table 8

*Frequency of Survey Participants Who Are Currently Raising Children Under 18*

|       |       | Frequency | Percent | Valid Percent | Cumulative Percent |
|-------|-------|-----------|---------|---------------|--------------------|
| Valid | No    | 1028      | 67.9    | 67.9          | 67.9               |
|       | Yes   | 486       | 32.1    | 32.1          | 100.0              |
|       | Total | 1514      | 100.0   | 100.0         |                    |

Results were from a total of 1,514 participants, 40% of whom were part of the Park Service group, 40.2% were found through the Amazon Mechanical Turk

survey, and 19.8% from the “snowball” survey shared through social media networks and email. Appendix C contains crosstabulations comparing the demographics of the three sample groups. The vast majority of respondents were white and non-Hispanic, between the ages of 18-39. Most participants had at least a college degree, and half of the participants were married. Two thirds of the participants were currently childless, with only 32.1% of participants raising children under the age of 18 in their home at the time of the survey. Overall, the demographics of the sample show a well-educated, mostly white sample population.

### **Results of Research Objectives**

#### Type of Environment When Growing Up

The first objective of this research was to investigate differences between people from rural, suburban, and urban areas. Participants were asked to describe the environment of their hometown as it was when they were growing up. Most respondents, 49.1%, grew up in suburban areas; while 32.5% were from an urban area. Only 18.4% were from rural hometowns.

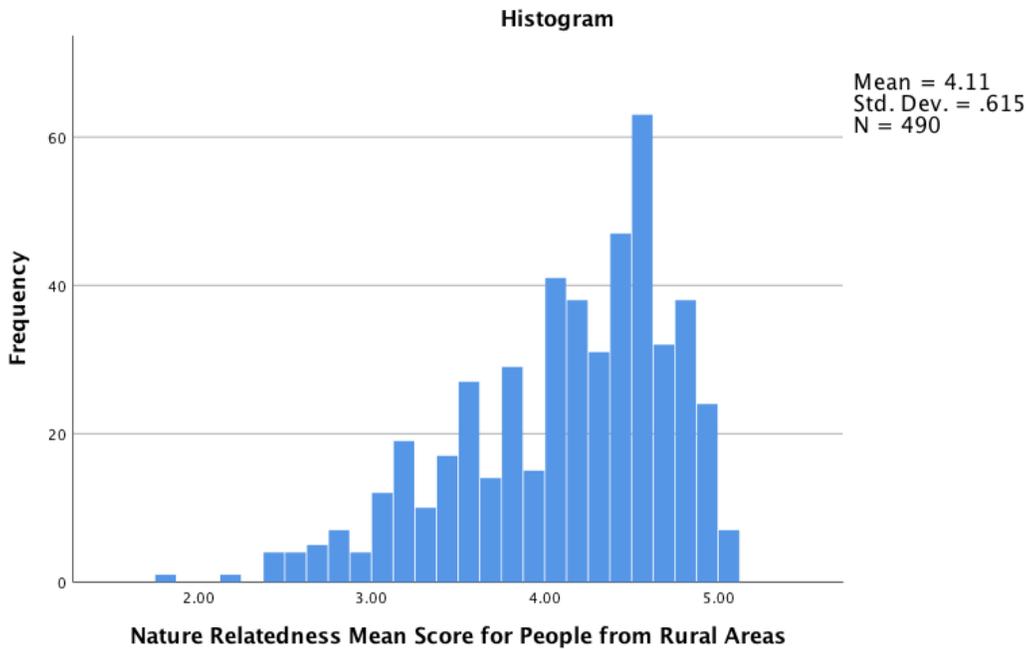
Table 9

*Comparison of Mean Nature Relatedness Scores based on Type of Hometown*

| Type of Hometown | Mean   | N    | Std. Deviation |
|------------------|--------|------|----------------|
| Rural            | 4.1121 | 490  | .61550         |
| Suburban         | 4.0576 | 742  | .64914         |
| Urban            | 3.7033 | 278  | .67822         |
| Total            | 4.0101 | 1510 | .66027         |

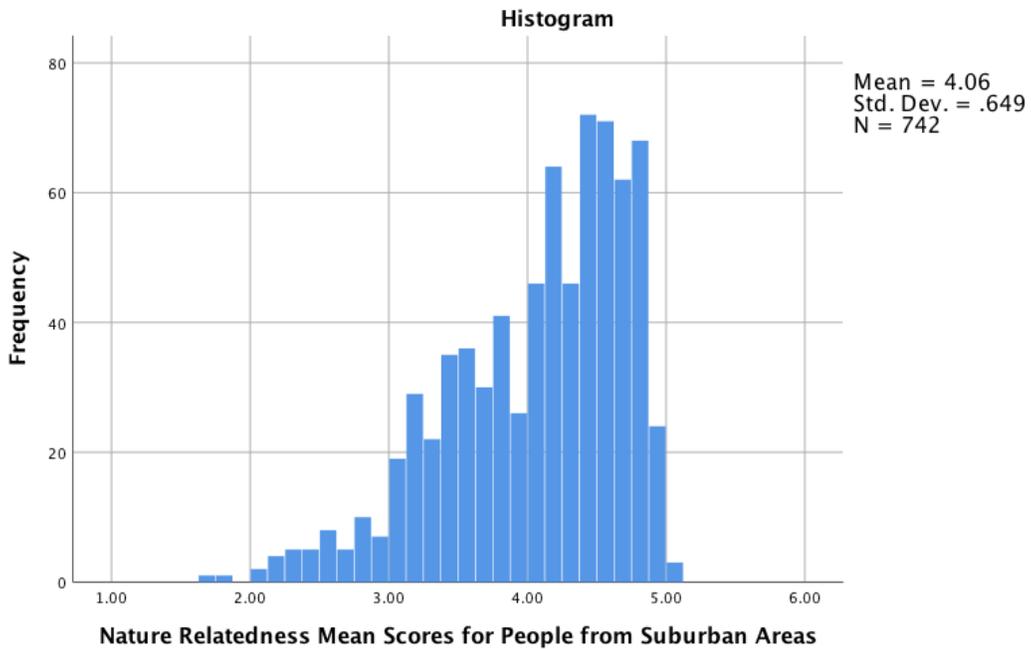
To compare mean Nature Relatedness scores from the rural, suburban and urban groups, a one-way ANOVA procedure was executed. It showed significant differences ( $F=39.736$ ,  $df= 2$  and  $1507$ ,  $p < .0005$ ) between the mean Nature Relatedness scores, with participants from the rural group having the highest NR mean of 4.11 out of a possible high score of five, suburban respondents in the middle with a mean of 4.06, and urban participants with the lowest NR mean of 3.70 (Table 9). This shows a significant difference in the mean scores of people from urban areas and people from suburban and rural areas. Figures 1, 2, and 3 are histograms that explore in more detail the differences in mean scores among people from rural, suburban, and urban areas.

Figure 1. Nature Relatedness scores of people from rural areas



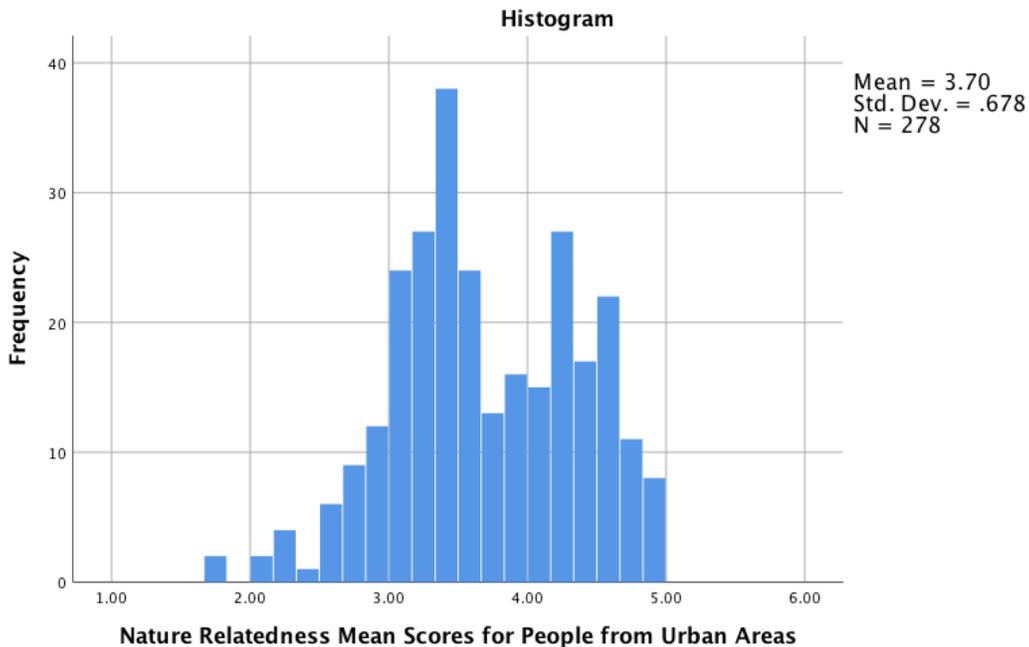
People from rural areas had the highest mean nature relatedness scores ( $m = 4.11$ ). People from suburban areas had slightly lower nature relatedness scores ( $m = 4.06$ ), shown below in Figure 2.

Figure 2. Nature Relatedness scores of people from suburban areas



People from urban areas had the lowest scores ( $m = 3.70$ ). A post-hoc Tukey test showed significant differences between urban mean scores and rural mean scores ( $p < .0005$ ) and between urban and suburban scores ( $p < .0005$ ).

Figure 3. Nature Relatedness scores of people from urban areas



### Impact of Parenthood on Nature Relatedness Scores

The second research objective was to identify any significant differences in Nature Relatedness mean scores between people with children under the age of 18 in the home and people who are not raising children. As summarized above, 32.1% of respondents are raising a child under 18 in the home. The study found that there were significant differences ( $t = -5.834$ ,  $df = 901.698$ ,  $p < .0005$ ) between those who have a child under the age of 18 in their home (mean = 3.92) and those with no children at home (mean = 4.11).

Figure 4. Nature Relatedness scores among people raising children

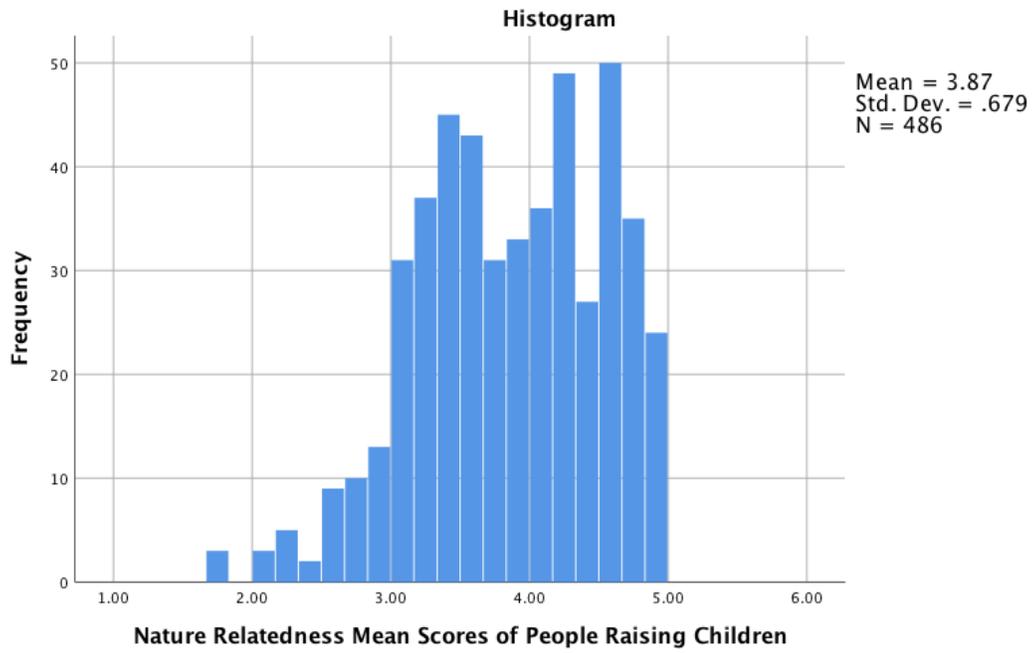
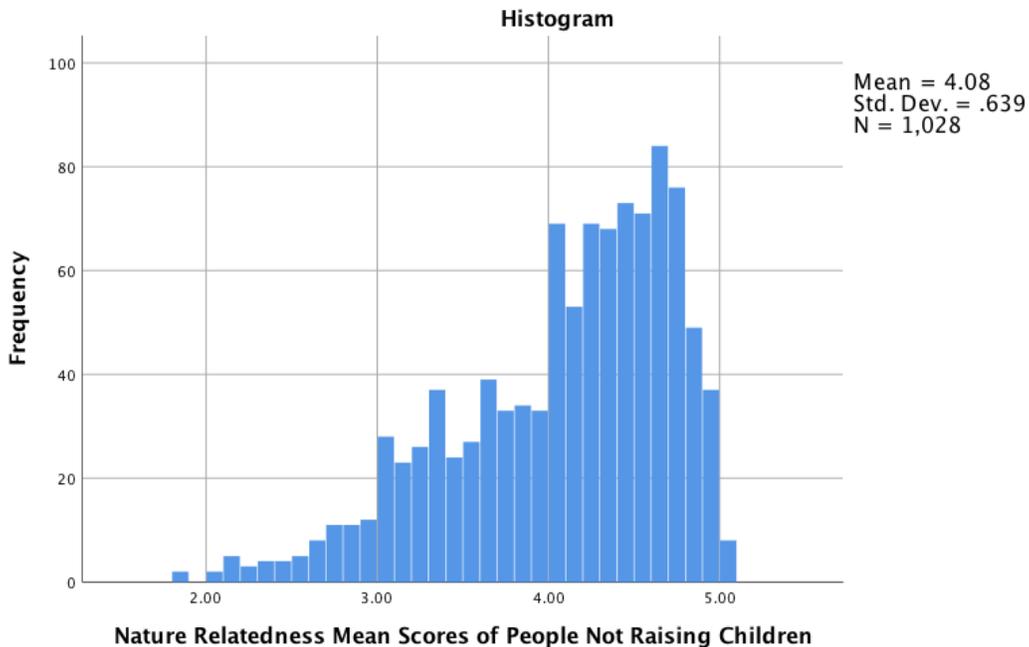


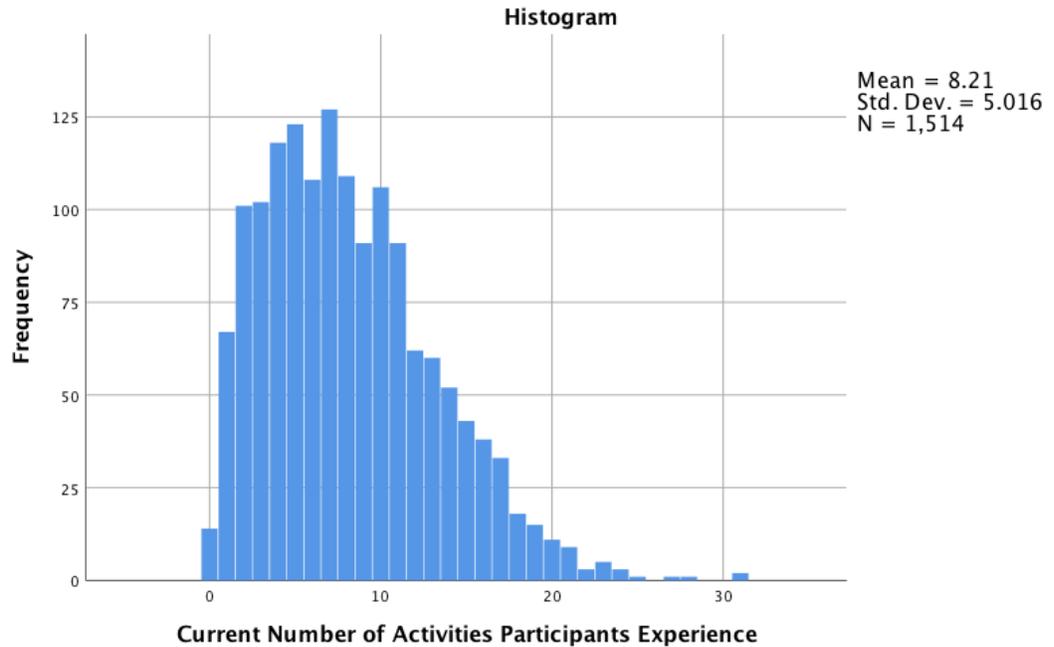
Figure 5. Nature Relatedness scores among people not raising children



### Impact of Participation in Outdoor Activities on Nature Relatedness Scores

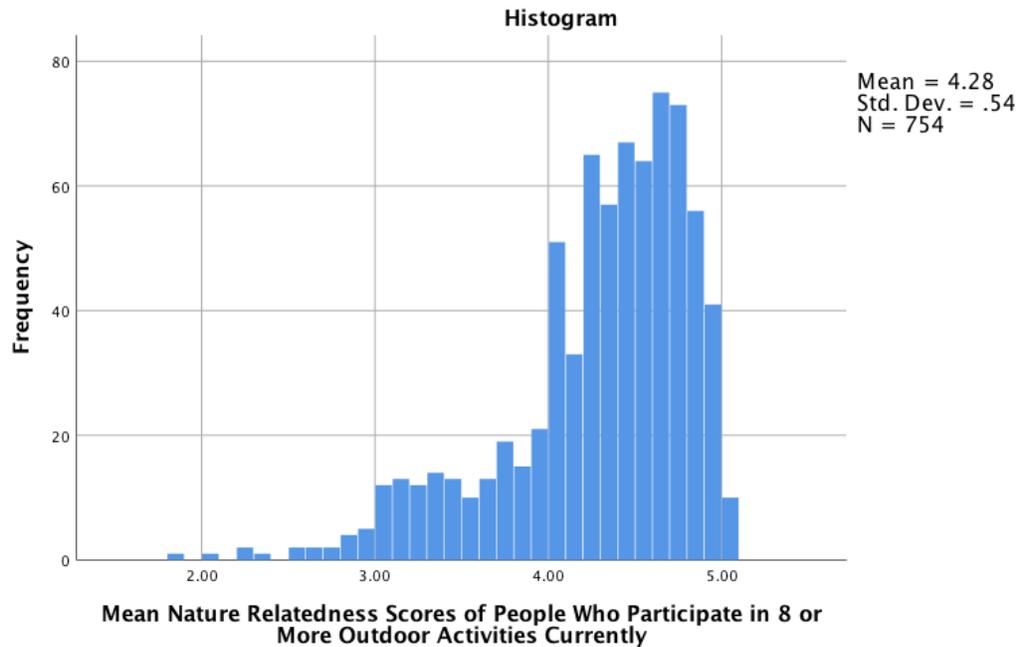
The third research objective was to determine if there are significant differences in the Nature Relatedness scores of people who participate in many outdoor activities and those who do not. The researcher asked participants to report on the number of outdoor activities they participate in now as an adult. Participants selected from 32 options, with the option to write in “other” and add an activity. The mean number of outdoor activities people currently participate in is 8.21 (Figure 6). The most popular activities were Leisure Walks (76.90%), followed by Hiking (59.10%), Grilling (55.00%), Reading Outside (48.60%), Walking a Pet (48.10%), and Camping (45.40%).

Figure 6: Number of outdoor activity types participants currently experience



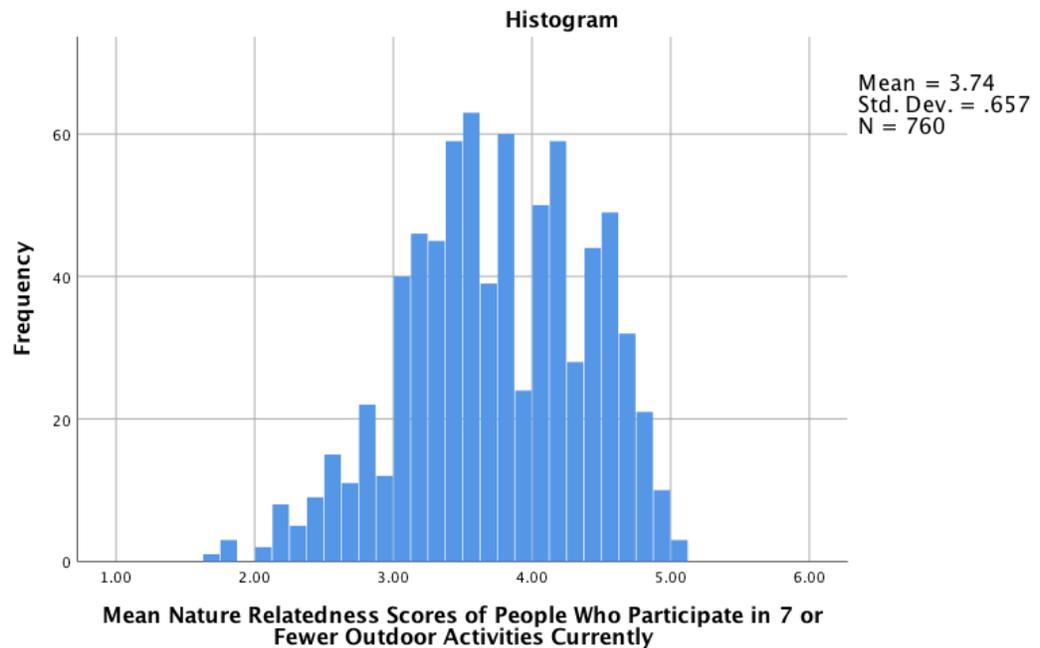
Researchers analyzed the Nature Relatedness scores of people who currently participate in many outdoor activities, defined as eight or more, and the scores of people who participate in fewer outdoor activities, defined as seven or fewer. The mean number of outdoor activities was 8.21, this was used as a cut point to divide respondents into two groups, those who participated in more than the mean number of activities, and those who participated in fewer. People who currently participate in more outdoor activities (n=754) had a mean Nature Relatedness Score of 4.28 (Figure 7).

Figure 7. Nature Relatedness scores among people who currently participate in 8 or more types of outdoor activities



People who currently participate in seven or fewer types of outdoor activities had a mean Nature Relatedness Score of 3.74 (Figure 8). An independent samples t-test ( $t= 17.580$ ,  $df=1461.509$ ,  $p < .0005$ ) showed significant differences between the two groups. This suggests that people who participate in fewer outdoors activities will have a significantly lower Nature Relatedness Score when compared to people who participate in many outdoor activities. These results suggest that participating in a variety of outdoor activities is related to a higher Nature Relatedness Score for adults.

Figure 8. Nature Relatedness scores among people who participate in 7 or fewer types of outdoor activities currently

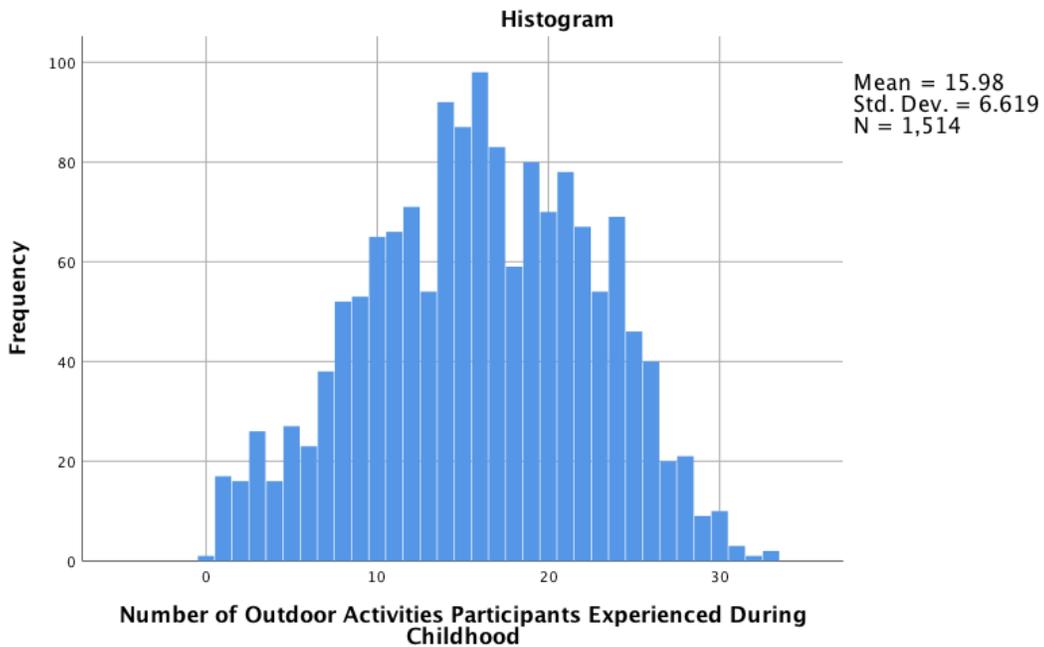


### Impact of Outdoor Activities During Childhood on Nature Relatedness Scores

Research objective four is to determine if there are significant differences in the Nature Relatedness scores of people who participated in many outdoor activities as children and those who did not. Participants were asked to select from 34 common outdoor activities they participated in as a child with the option to select “other” and write in an activity. The mean number of responses for participants was 15.98 activities. The most popular activity was Playing Outside (defined as unstructured free play - not team sports), with 1414 of participants or 93.5% of participants saying they did this as a child. The next most popular was

Riding a Bike (91.1% of participants), Playing Outside at Playgrounds with 81.8% of participants, and Playing Outside (without adult supervision in abandoned lots and open spaces) at 81.4%. Other popular activities in childhood included Swimming (81.2%), Outdoor Picnics (75.1%), Leisure Walks (67.1%), Grilling Outside (65.9%), Playing Outside (with adult supervision) (64.8%), and Reading Outside (64.6%).

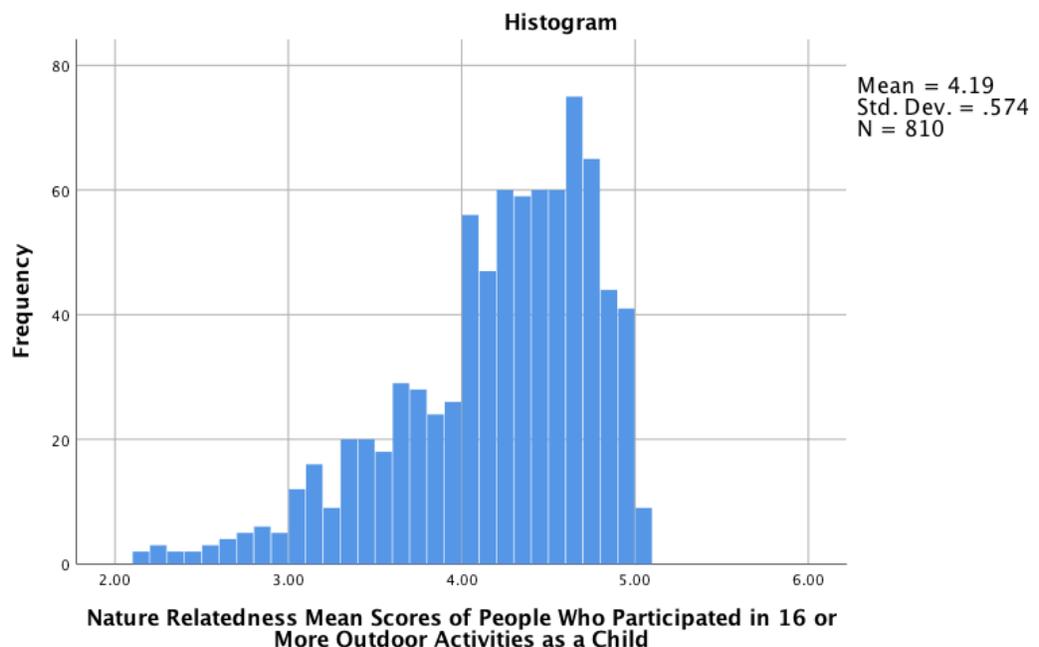
Figure 9. Number of outdoor activities participants experienced as a child



This research objective examines whether a larger diversity of outdoor activity types experienced during childhood can contribute to a higher Nature Relatedness score as an adult. The mean number of outdoor activities people participated in as children was 15.89, so 16 was used as a cut point to divide respondents into two groups for comparison. People who participated in 16 or

more outdoors activities (n=810) had a mean Nature Relatedness Score of 4.19, a high score (Figure 10).

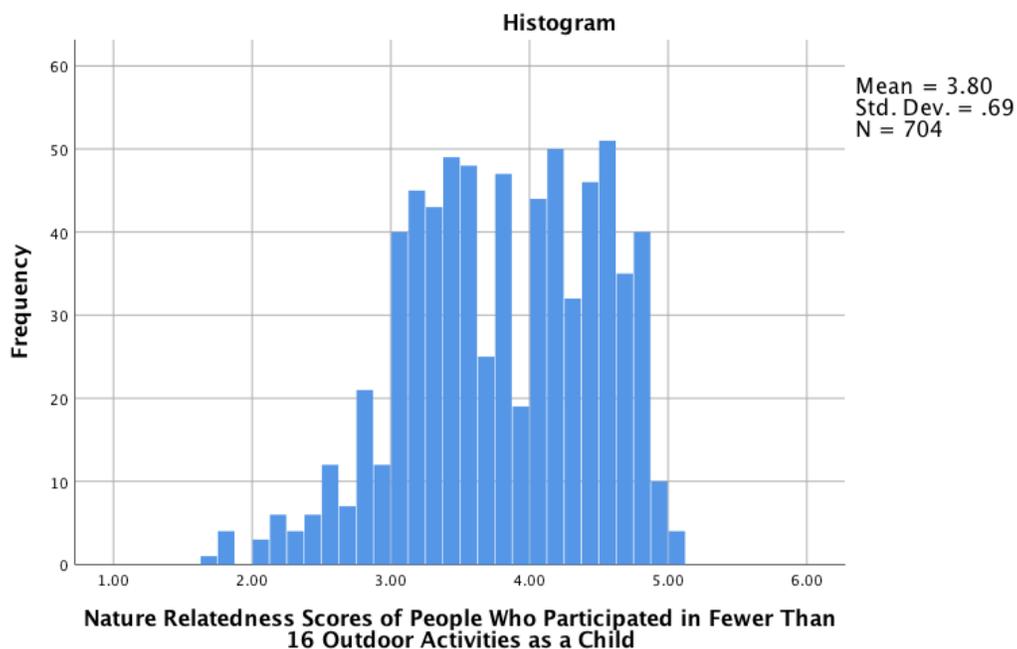
Figure 10. Nature Relatedness scores of people who participated in 16 or more types of outdoor activities as children



People who participated in 15 or fewer outdoor activities had a mean Nature Relatedness Score of 3.80, a lower score, suggesting that people who participated in fewer types of outdoors activities as children have a weaker connection to nature as adults (Figure 11). An independent samples t-test ( $t =$

11.874,  $df=1371.717$ ,  $p < .0005$ ) showed significant differences between the two groups.

Figure 11. Nature Relatedness scores of people who participated in 15 or fewer types of outdoor activities as children



### Impact of Screen Time on Nature Relatedness Scores

The fifth and final research objective was to determine if there are significant differences in the Nature Relatedness scores of people who report higher levels of screen time compared to people who report lower levels of screen time. Screen time was defined as hours per day spent watching television, playing computer games, or spending time with another electronic device. Participants selected from scaled options ranging from less than one half

hour per day to more than 5 hours per day. Participants were asked to respond to the questions for Monday – Friday screen time and outdoor time, and weekend or “non-school day” screen time and outdoor time. Results for screen time during a typical weekend are summarized below in Table 10.

Table 10

*Amount of Self-Reported Screen Time During a Typical Weekend (Saturday – Sunday)*

|         |                       | Frequency | Percent | Valid Percent | Cumulative Percent |
|---------|-----------------------|-----------|---------|---------------|--------------------|
| Valid   | 2 hours or less       | 351       | 23.2    | 23.3          | 23.3               |
|         | Between 2 and 4 hours | 650       | 42.9    | 43.1          | 66.4               |
|         | 4 hours or more       | 507       | 33.5    | 33.6          | 100.0              |
|         | Total                 | 1508      | 99.6    | 100.0         |                    |
| Missing | System                | 6         | .4      |               |                    |
| Total   |                       | 1514      | 100.0   |               |                    |

The amount of screen time participants experienced on weekends was analyzed using the Means procedure in SPSS and the ANOVA procedure ( $F=17.645$ ,  $df=2$  and  $1505$ ,  $p < .0005$ ). A post-hoc Tukey test showed significant differences between people who spend four hours or more per weekend day with screens when compared to people who spend two hours or less ( $p = .009$ ) or between two and four hours ( $p < .0005$ ). Respondents who spent four hours or more with screens on the weekends had a lower Nature Relatedness mean score (mean = 3.88). Participants who reported between two and four hours had the highest Nature Relatedness mean score (4.11). Those who reported the

lowest amount of screen time, two hours or less, had a mean NR score of 4.01.

Table 11 below summarizes these results.

Table 11

*Nature Relatedness Mean Scores Compared to Screen Time During a Typical Weekend (Saturday – Sunday)*

| Screen Time on Weekends | Mean   | N    | Std. Deviation |
|-------------------------|--------|------|----------------|
| 2 hours or less         | 4.0152 | 351  | .65140         |
| Between 2 and 4 hours   | 4.1118 | 650  | .61344         |
| 4 hours or more         | 3.8821 | 507  | .70046         |
| Total                   | 4.0121 | 1508 | .65979         |

Next, the amount of screen time participants experienced on typical weekdays (Monday – Friday) was analyzed using the Means procedure in SPSS and the ANOVA procedure ( $F= 5.754$ ,  $df=2$  and  $1502$ ,  $p=.003$ ). A post-hoc Tukey test showed significant differences between the heaviest screen users, with four hours or more per weekday, compared to moderate users between two and four hours per day ( $p = .003$ ). Respondents who spent four hours of more with screens on the weekdays had the lowest Nature Relatedness Mean Score (mean = 3.95). Participants who reported between two and four hours had the highest Nature Relatedness mean score (4.09). Those who reported the lowest amount of screen time, two hours or less, had a mean NR score of 3.98. Tables 12 and 13 below summarize these results.

Table 12  
*Amount of Self-Reported Screen Time During a Typical Work Week  
 (Monday – Friday)*

|         |                       | Frequency | Percent | Valid Percent | Cumulative Percent |
|---------|-----------------------|-----------|---------|---------------|--------------------|
| Valid   | 2 hours or less       | 398       | 26.3    | 26.4          | 26.4               |
|         | Between 2 and 4 hours | 571       | 37.7    | 37.9          | 64.4               |
|         | 4 hours or more       | 536       | 35.4    | 35.6          | 100.0              |
|         | Total                 | 1505      | 99.4    | 100.0         |                    |
| Missing | System                | 9         | .6      |               |                    |
| Total   |                       | 1514      | 100.0   |               |                    |

Table 13  
*Nature Relatedness Mean Scores Compared to Screen Time on Weekdays  
 (Monday-Friday)*

| Screen Time on Weekdays | Mean   | N    | Std. Deviation |
|-------------------------|--------|------|----------------|
| 2 hours or less         | 3.9894 | 398  | .66210         |
| Between 2 and 4 hours   | 4.0851 | 571  | .62866         |
| 4 hours or more         | 3.9551 | 536  | .68470         |
| Total                   | 4.0135 | 1505 | .65998         |

### Open Ended Question

The study concluded with a single open-ended question: “Is there anything else you would like to tell us about spending time outdoors?” This provided an opportunity for participants to share their thoughts. Of the 1,514 people who completed the survey, 626 of them provided optional responses. Of the 626 written responses, 144 of them were variations of “N/A” or “nothing to add” so

these were removed from analysis, resulting in 482 responses which were read in detail, coded, and organized into five themes. The themes were not predetermined by the researcher. Results from the survey participants revealed five major themes related to the human connection to nature: Social Influence, Mental/Physical Health, Safety, Access, and Weather/Climate. Each of these overarching themes had multiple dimensions and were discussed in both positive and negative ways.

### Social Influence

The first theme that emerged was Social Influence. Many participants described the social aspect of their connection to nature, including responses that described parents, grandparents, and even significant others who introduced them to an outdoor place or activity that resulted in a lasting connection. Several mothers wrote about the importance of sharing nature with their children, and one grandmother said she felt her kids and grandkids only go outside to make her happy, saying “They only tolerate our hiking and kayaking to make me happy, as if doing me a favor.” A few shared that their families were not “outdoorsy” and that they found a connection with nature later in life.

The social influence of spending time outdoors was not universally positive. One Eagle Scout said they are “sick of outdoor time for the sake of it” and another person described an anxiety disorder they struggle with that causes them to only want to spend time outdoors alone, but they feel “people will judge me for wanting to be alone.”

## Mental/Physical Health

The second theme was Mental/Physical Health. The influence of nature and technology on mental health was discussed. It became clear from these responses that the impact of nature and technology on physical and mental health is different for every individual, and it changes throughout the lifespan, though patterns did emerge. Several respondents noted that screen time was causing anxiety and depression; one participant made a direct connection between their purchase of a smart phone three years ago and their current level of anxiety, saying that their anxiety prevents them from going outdoors. Others described the energy boost, mental clarity, and reduced stress that they feel outdoors. The impact on mental health had a spiritual dimension for many. A respondent described spending time in nature as “my church” and another said “Being in nature is my zen. It calms me and keeps me amazed.” Others reported improved mood and memory, and one person said they become irritable without spending time outside. One person described a mental health challenge, saying “depression makes it hard to get out of bed, never mind going outside.”

Physical health was cited by many as a benefit of spending time in nature, including fresh air and the health benefits of exercising outdoors. Physical health was also described as a barrier to access for many people. Dozens of responses described disabilities, both new and chronic, that prevented the survey participants from going outside. One person wrote about a new physical disability “which is heartbreaking and limiting my joy.” Other physical health issues that

were discussed included adult-onset asthma, severe and worsening allergies, issues with sun exposure, and chemo treatment. Several people who were recovering from illness or broken bones responded with a sense of hope, with one individual saying, “I have had health problems in the last few years that have reduced my outdoor time, but that will change as I heal.” Another person described a serious health issue that developed in adulthood. They said they used to spend time in the wilderness, even solo backpacking. They said their illness “curtailed all physical activity for me and completely changed my life. I’m so glad I used to spend a bunch of times in the woods, because I’ve got all those memories now to look back on.”

A mother raising a child with special needs described how difficult it is to spend time outdoors and with “rising rates of autism and other developmental disabilities you may see a correlation in necessary supervision of outdoor activities and use of technology as a coping tool.” She described her daughter attempting to join the Girl Scouts but found “all they seem to care about in our area is tech.”

## Safety

Safety was the third theme that emerged, with safety identified as a concern and a barrier for spending time in nature. One participant answered simply “The world isn't as safe anymore.” Others said their neighborhood or city were not safe, and one person said “It's harder to enjoy the outdoors where I currently live. It's a very urban area and it's not as enjoyable or as safe to be outside as it was when I was a child.” A participant from the southwest said they have “mental hold ups about going out into the desert around me.” A parent said they do not allow their children to play outside except at the park and another parent mentioned that the age of their children is a factor in the amount of unsupervised time they can have. Several responses focused on the freedom they felt when they were unsupervised outdoors as children. One person said they “roamed free” and another said they grew up in the woods and now advocate for kids spending time outdoors because it makes them “feel human”. One woman described the vacant lot in her urban neighborhood as a child, and how it allowed for exploration, which she feels led her to a job working outdoors for the National Park Service.

Safety was just one barrier to access, and it was cited often enough that it merited its own theme in the findings. Multiple other barriers to access were found, including finances, distance, urbanization, transportation, limited time, and overcrowding. These other barriers comprise the fourth theme that was found and are discussed together under the theme of barriers to access. Three

participants identified high costs as a barrier to their participation in outdoor activities. Two mentioned the expensive entry fees of National Parks, and one said, “hunting and fishing have gotten too expensive.” One participant summarized the financial barriers succinctly: “It’s vitally important to me, but economic issues force us to work too much to be able to spend much time outside” and another described it as a luxury, saying “It’s become more of a luxury than anything else. I cherish my time outdoors, even though it doesn’t happen often.” One person, presumably a government employee, wrote “The shutdown has increased my ability to spend time outdoors which has altered my answers to some of the above questions.” Time, and the lack of free time, came up repeatedly. One person said, “I like the outdoors but not in an urban area and I lack the time to make excursions into the real outdoors” while another wrote, “I wish I could make time for it.” One person who identified themselves as an Environmental Science major said, “Between school and work I find it hard to be outside, but I really do love it” and another mentioned “crazy schedules with work and family activities.”

Transportation, or lack of, was another barrier to access. Some participants mentioned not having a car or having to rely on public transportation as a barrier. Surprisingly, cars were mentioned as a barrier in a second way. Two respondents said cars degraded their experiences outdoors. One said, “the sound of cars is so overbearing that it almost takes away from the experience. When I’m not bombarded by the sound of cars, I think I feel more of the

therapeutic benefits of spending time outside.” And another wrote “I would like to spend time outdoors but the area I live doesn't have good access to parks or recreational places without having to drive. Too much car focused society/community where I live.” Other barriers cited by participants included overcrowding and urbanization, with one respondent summarizing, “I currently live in a more populated area than I did where I grew up. The difference has been rough. It's not the same going outside here as it was in Wyoming and Montana. It's a little depressing, so it keeps me from going out for leisure.”

### Weather and Climate

Weather and climate comprised the fifth and final major theme that emerged in the data. The survey was conducted in winter in the Northern Hemisphere, so a large portion of the responses mentioned the cold weather as a reason for not spending time outdoors. One extreme example was from a participant who was serving a tour of duty at a research station in Antarctica, though most responses described enjoying better weather and longer daylight hours to enjoy in the summer. Some participants wrote that they loved spending time outdoors even in cold weather.

Global climate change was only mentioned twice. One participant wrote “I've spent 10 years documenting climate change in national parks. The environmental degradation is noticeable & alarming” and another person wrote “Outdoor time is much more limited by climate now than when I was a child in Indiana.”

The results presented above indicate that Nature Relatedness is impacted by whether someone grew up in a rural, suburban, or urban area. Other impacts to Nature Relatedness included parenthood, participation in outdoor activities as a child and as an adult, the social influence of family and friends, mental and physical health, safety, the ability to access the outdoors, and weather and climate. A more detailed summary and discussion of the findings are presented in the next chapter.

## CHAPTER 5

### DISCUSSION

As an aid to the reader, this final chapter restates the research objectives and reviews the methods used in the study. The major sections of this chapter summarize the results and discuss their implications. Limitations of the study, relationship to the literature, and suggestions for further research are also discussed.

Humans are currently living beyond the available resources of the world, accelerating the destruction of the planet (Kitzes et al., 2008) and disconnection with the natural world may be contributing to our planet's destruction (Dutcher et al., 2007; Meyer & Frantz, 2004; Nisbet et al., 2009; Schultz, 2001). As the world becomes increasingly urbanized and population grows, more people are growing up and living in urban environments. Research quantifying the connection to nature among people from urban, suburban, and rural environments is limited. The purpose of this study was to determine if there are significant differences between rural, suburban, and urban populations in their level of connection to nature. This information will be used to understand or correct stereotypes about connection to nature in varying populations.

The need for research into differences between rural, suburban, and urban populations in their connectedness to nature has been described in several studies. Chawla (2015) described the need for a greater understanding of “how experiences of nature vary by culture, economic opportunity, and class.” Asah et al. (2012) described how a more representative sample of adults from the general public could help increase understanding of how different nature exposure mechanisms in childhood can predict environmental citizenship behaviors and commitment to nature-based activities in adulthood. The 2013 results from a survey by the Royal Society for the Protection of Birds suggested that urban children are more connected to nature, and the published report included a call to action for schools, families, governments, and other organizations to use the same questionnaire to measure their own populations and to see how the scores change over time.

Investigating the nature relatedness of people who are raising children under the age of 18 in their home, compared with people who are not raising children, will show if there are significant differences in attitudes between these two groups and can serve as a predictor for their children’s future attitudes toward nature. Research has shown that parental attitudes toward nature can influence children’s attitudes and vice versa (Dunton, et al., 2010; Greer et al., 2017).

As explained in Chapter Two, the study reported here was a quantitative survey of 1,514 U.S. residents. As a quantitative survey, the study primarily

focused on requesting responses on a Likert Scale, using the Nature Relatedness Instrument, and collecting demographics information. However, an open-ended question “Is there anything else you would like to tell us about spending time outdoors?” was included, creating a qualitative component and making this a mixed-methods study.

The first objective of the study was to investigate differences in mean Nature Relatedness scores and compare them for people who grew up in rural, suburban, and urban areas. The results showed clear differences between the groups. The rural participant had the highest mean scores ( $m = 4.11$ ). Suburban participant mean scores were slightly lower ( $m = 4.06$ ) and the lowest scoring group were the urban participants ( $m = 3.70$ ). These results could have implications for future generations as the world becomes increasingly urbanized. Results from countries in Europe (Van Den Berg, 2007; Royal Society for the Protection of Birds, 2013) suggest that it is still possible for people in densely urbanized areas to have a strong connection to nature. Population projections (U.S. Census Bureau, 2017) show that we are moving into a future that will be more urban, so these results may be seen as a preview for what is to come.

These results should not be interpreted to suggest that being from a rural area will by default create a stronger connection to nature. Despite being surrounded by nature, it is possible for individuals from rural populations to feel disconnected. A study on people’s ability to predict the benefits of time in nature (Nisbet & Zelenski, 2011) suggests that "people may avoid nearby nature

because a chronic disconnection from nature causes them to underestimate its hedonic benefits." A lack of organized recreation opportunities in less populated areas could contribute to this disconnection, as rural areas have fewer developed recreation facilities than urban settings (Payne & Schaumleffel, 2008).

The second research objective was to investigate differences in Nature Relatedness mean scores between parents and non-parents. Parents were defined as people who are currently raising a child under the age of 18 in their home. This definition allowed inclusion of non-biological parents, foster parents, grandparents, and other caregivers who are actively raising children. This definition intentionally excluded people with adult children or children no longer in the home, as the intention of this question is to help make a prediction about future generations and their connection to nature. Research suggests that parental behaviors and attitudes can impact the behaviors and attitudes of their children, so a strong connection to nature among parents could be a predictor of the same for their children. The results from this study showed differences in mean Nature Relatedness Scores, with parents having a lower score (mean = 3.92) and non-parents having a higher score (mean = 4.11). These results suggest that the current generations of children are being raised by adults with a lower connection to nature than non-parents. Other research has shown that people with children demonstrate less concern about serious environmental issues like climate change. For example, a "survey conducted in the United States, Canada, and Britain found that people with children were consistently

less likely to believe that climate change was a serious threat, less likely to talk about it, and significantly less likely to have an opinion on how to deal with it” (Marshall, 2014, p.189).

The third research objective was to determine if there are significant differences in the Nature Relatedness scores of people who participate in many outdoor activities and those who do not. The study found that people who engage in eight or more outdoor activities such as leisure walks, hiking, grilling, walking a pet, and camping, had higher scores than people who participate in seven or fewer types of activities. People who participate in eight or more types of activities had a higher Nature Relatedness score (mean = 4.28) than people who participated in seven or fewer (mean = 3.74). These findings suggest that participating in a higher number of activities, or a larger diversity of activities, is related to a higher Nature Relatedness score.

The fourth research objective was to investigate the number of outdoor activities adults participated in when they were children. Adults selected from 34 different activities. The mean number of responses was 15.98 activities, which included activities such as riding a bike, unstructured free play, playing at playgrounds, playing outside without adult supervision in abandoned lots and open spaces, and swimming. People who participated in 16 or more activities had a higher mean NR score (mean = 4.19) than people who participated in 15 or fewer outdoor activities (mean NR score = 3.80).

Parents and professionals working with children should consider these results, as other findings in the literature suggest exposing children to a large number of outdoor activities as children can make them more likely to overcome barriers to participate in them as adults (Asah et al., 2012). This could potentially increase their likelihood of having a higher NR scores as an adult, and therefore make them more likely to engage in environmentally responsible behaviors. This result was echoed in the qualitative results, with one person saying “I didn’t go camping until I was 18, and loved it. I wasn’t brought up to be adventurous, and feel that lack of training as an adult, sadly.”

The fifth and final research objective was to examine the impact of screen time on Nature Relatedness scores. A study (Larson et.al, 2018) published just a few months before this study was conducted suggested that higher levels of screen time were related to a lower connection to nature. The results of this analysis were less clear. Table 11 in Chapter Four summarizes the results. Per the recommendations of the lead author of the above study (Lincoln Larson, personal communication, October 26, 2018), the present study’s researchers chose to investigate screen time use on weekdays (defined as Monday – Friday) and weekends (defined as Saturday – Sunday) to identify any differences associated with the work week. Results from the weekend showed that participants with the lowest NR scores (n = 507, mean NR score = 3.88) reported the highest levels of screen time with four or more each weekend day. Participants with the lowest self-reported levels of screen time of two hours or

less (n = 351, mean NR score = 4.02) had a slightly higher NR mean score than the heavy screen users' group. The highest mean NR scores (n = 650, mean = 4.11) were from the group with moderate screen usage of two to four hours per day.

Results for weekday use followed a similar pattern. Tables 12 and 13 in Chapter Four summarize these results. Participants with the lowest mean NR scores (n=536, mean NR Score = 3.95) did report the highest level of screen time, with four hours or more, similar to the weekend results above. Adults with the lowest self-reported amount of screen time on weekdays (n=398, mean NR score = 3.99) had only a slight difference in NR mean when compared with the group reporting the highest level of screen use. The group with moderate screen use, with two to four hours per weekday (n=571, mean NR score = 4.09) had the highest NR mean scores, similar to the weekend results.

### **Limitations**

This study used self-report measures to assess time spent outdoors and time spent with screens. The metric was based on a 2018 screen time versus outdoor time study (Larson et.al, 2018). Those study authors identified a limitation with the metric, in that it did not separate weekdays (i.e. "school days") from weekends (i.e. "non-school days"); therefore, per their recommendation, the instrument was edited to investigate differences in outdoor time and screen time on weekdays and on weekends. This may or may not have improved the data

quality, as “There are some obvious limitations of the rather coarse, self-reported metric (vs. time diaries, objective measures, etc.) when assessing leisure time budgets, but it does provide a nice relative measure between outdoor time and screen time” (Lincoln Larson, personal communication, October 26, 2018). Significant differences were not found between the weekend and weekday results, suggesting that the biggest limitation is the retrospective self-report instrument. It should be noted that the hours of screen use that were reported in this study are significantly below other estimates of current American screen use, averaging anywhere from seven to nine hours per day (Common Sense Media, 2019). It should be noted that this survey was conducted in the winter months, when many United States citizens were dealing with freezing temperatures, which may have affected responses on screen use and attitudes toward spending time in nature.

A question about household income would have enriched the findings and perhaps offered alternative explanations. Per Maslow’s hierarchy of needs (Maslow, 1943), it is wealthier households and individuals who can afford to be “green” in their beliefs and actions, as they do not have to choose between their own survival and the survival of nature. Further limiting the study, the majority of responses, over 80%, were from people identifying as white. People who identify as white make up only 72.3% of the general population (U.S Census Bureau, 2017), and the United States is projected to be less white within the next generation (U.S. Census Bureau, 2018).

## **Suggestions for Additional Research**

This study was limited to its own five objectives, however, several ideas for future research opportunities emerged. These include:

1. Safety, or the perceived lack of safety, in the outdoors was repeatedly mentioned as a barrier to access for spending time in the outdoors. A study investigating the relationships between, race, income, parenthood, and beliefs around safety in the outdoors would help the field understand this issue.

2. A previous study (Kalish, et. al, 2010) suggested that Spanish speaking parents were less likely to allow their children to spend unsupervised time outdoors. A qualitative study on individual experiences and sense of safety in the outdoors could improve understanding of these issues.

3. This study showed differences in mean Nature Relatedness scores for parents and non-parents. Further studies are needed to confirm these results and explore why there is a difference.

4. The Nature Relatedness scale was used in this study because it has been correlated with a likelihood to engage in environmentally responsible behavior (Nisbet et al., 2009; Tam, 2013). However, having a high NR score does not confirm that individuals are working to protect the environment. A study that calculates individual carbon footprints or an index of environmentally responsible behaviors would be interesting for exploring whether having a high or

low Nature Relatedness score matters when it comes to protecting the environment.

### **Conclusion**

In sum, this study confirmed there are differences in mean Nature Relatedness scores among people from rural, suburban, and urban populations. Specifically, rural people reported the strongest connection with nature, and urban people had the lowest connection. This study also suggests there are differences in the connection to nature between parents and non-parents, with our data suggesting that non-parents have a stronger connection to nature. Participating in a higher diversity and number of outdoor activities both as an adult and as a child were related to having a stronger connection with nature. Further research is needed on the effect of screen time and its impact on attitudes toward nature.

## REFERENCES

- Anonymous. *Sample Size Calculator* [Use in 60 seconds]. (2018, October 22). Retrieved from <https://www.qualtrics.com/blog/calculating-sample-size/>.
- Asah, S. T., Bengston, D. N., & Westphal, L. M. (2012). "The influence of childhood: operational pathways to adulthood participation in nature-based activities." *Environment and Behavior*, 44 (4), 545–69.
- Bowler, D. E., Buyung-Ali, L. M., Knight, T. M., & Pullin, A. S. (2010). A systematic review of evidence for the added benefits to health of exposure to natural environments. *BMC Public Health*, 10, 456. doi:10.1186/1471-2458-10-456
- Buhrmester, M., Kwang, T., & Gosling, S. (2011). Amazon's Mechanical Turk: A new source of inexpensive, yet high-quality, data? *Perspectives on Psychological Science*, 6(1), 3-5. Retrieved from <http://www.jstor.org.steenproxy.sfasu.edu:2048/stable/41613414>
- Burdette, H. L., Whitaker, R. C. (2005). Resurrecting free play in young children: Looking beyond fitness and fatness to attention, affiliation, and affect. *Arch. Pediatric Adolescent Medicine*. 159(1), 46.
- Chawla, L. (2015). Benefits of nature contact for children. *Journal of Planning Literature*, 30(4), 433-452.

- Cheng, J. C. H., & Monroe, M. C. (2012). Connection to nature: Children's affective attitude toward nature. *Environment and Behavior*, 44(1), 31-49.
- Clayton, S. (2003). Environmental identity: A conceptual and an operational definition. In S. Clayton & S. Opatow (Eds.), *Identity and the natural environment: The psychological significance of nature* (pp. 45-65). Cambridge, MA: MIT Press.
- Cleland, V., Timperio, A., Salmon, J., Hume, C., Telford, A., Crawford, D. A. (2011). Longitudinal study of the family physical activity environment and physical activity among youth. *American Journal of Health Promotion*, 25(3):159-167. doi:10.4278/ajhp.090303-QUAN-93
- Common Sense Media [Web Report]. (2019). *The Common Sense Census: Media Use by tweens and teens, 2019*. Retrieved from <https://www.commonsensemedia.org/research/the-common-sense-census-media-use-by-tweens-and-teens-2019> (2019, November 3).
- Creswell, J. W. (2014). *Research design: Qualitative, quantitative and mixed methods approaches* (4th ed.). Thousand Oaks, CA: Sage.
- Davis, J. L., Green, J. D., & Reed, A. (2009). Interdependence with the environment: Commitment, interconnectedness, and environmental behavior. *Journal of Environmental Psychology*, 29(2), 173-180.  
<http://dx.doi.org/10.1016/j.jenvp.2008.11.001>

- Dunton, G., Liao, Y., Almanz, E. et al. Joint physical activity and sedentary behavior in parent-child pairs. (2012). *Medical Science Sports Exercise*, 44(8):1473– 1480. doi:10.1249/MSS.0b013e31825148e9
- Dutcher, D. D., Finley, J. C., Luloff, A. E., & Johnson, J. B. (2007). Connectivity with nature as a measure of environmental values. *Environment and Behavior*, 39(4), 474-493. doi: 10.1177/0013916506298794
- Faber Taylor, A., & Kuo, F. E., 2009. Children with attention deficits concentrate better after walk in the park. *Journal of Attention Disorders* 12(5), 402-409.
- Frumkin, H. (2001). Beyond toxicity: Human health and the natural environment. *American Journal of Preventive Medicine*, 20(3), 234-240.
- Gifford, R., & Nilsson, A. (2014). Personal and social factors that influence pro-environmental concern and behaviour: A review. *International Journal of Psychology*, 49, 141-157.
- Greer, A., Castrogivanni, B., & Marcello, R., (2017). Park use and physical activity among mostly low-to-middle income, minority parents and their children. *Journal of Physical Activity and Health*, 14(2), 83-88.
- Hartig, T., Mang, M., & Evans, G. W. (1991). Restorative effects of natural environment experiences. *Environment and Behavior*, 23(1), 3-26.
- Kalish, M., Banco, L., Burke, G., & Lapidus, G. (2010). Outdoor play: A survey of parent's perceptions of their child's safety. *Journal of Trauma*, 69 (4 Suppl. I), S218-S222.

- Kals, E., Schumacher, D., & Montada, L. (1999). Emotional affinity toward nature as a motivational basis to protect nature. *Environment and Behavior, 31*, 178-202.
- Kaplan, S. (1995) The restorative benefits of nature: Toward an integrative framework. *Journal of Environmental Psychology 16*, 169-182.
- Kitzes, J., Wackernagel, M., Loh, J., Peller, A., Goldfinger, S., Cheng, D., & Tea, K. (2008). Shrink and share: Humanity's present and future ecological footprint. *Philosophical Transactions: Biological Sciences, 363*(1491),467-475. Retrieved from <http://www.jstor.org.steenproxy.sfasu.edu:2048/stable/20208444>
- Laird, S., McFarland, L., & Allen, S. (2014). Young children's opportunities for unstructured environmental exploration of nature: Links to adults' experiences in childhood. *International Journal of Early Childhood Environmental Education. 2*, 58-75.
- Larson, L. R., Szczytko, R., Bowers, E. P., Stephens, L. E., Stevenson, K. T., & Floyd, M. F. (2019). Outdoor time, screen time, and connection to nature: Troubling trends among rural youth? *Environment and Behavior, 51*(8), 966–991. <https://doi.org/10.1177/0013916518806686>
- Lindsey, G., Maraj, M., & Kuan, S. (2001). Access, equity, and urban greenways: an exploratory investigation. *Professional Geographer. 53* (3), 332-346.
- Louv, R. (2005). *Last child in the woods: Saving our children from nature deficit disorder*. Chapel Hill, NC: Algonquin Books.

- Ludwig, D. S. (2007). Childhood obesity—the shape of things to come. *New England Journal of Medicine*, 357(23), 2325-2327.
- McFarland, A. L., Zajicek J. M., & Waliczek T. M. (2014) The relationship between parental attitudes toward nature and the amount of time children spend in outdoor recreation. *Journal of Leisure Research*, 46(5), 525-539, DOI: [10.1080/00222216.2014.11950341](https://doi.org/10.1080/00222216.2014.11950341)
- Maslow, A. H. (1943). A theory of human motivation. *Psychological Review*, 50(4), 370-396.
- Mayer, F., & Frantz, C. (2004). The connectedness to nature scale: A measure of individuals' feeling in community with nature. *Journal of Environmental Psychology*, 24, 503-515.
- McNemar, Q. (1946). Opinion-attitude methodology. *Psychological Bulletin*, 43, 283-294.
- Moore, R. C. (1980). *Childhood's domain: Play and place in child development* (Vol. 6). Routledge.
- 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:10.1177/0013916508318748
- Nisbet, E. K., & Zelenski, J. M. (2011). Underestimating nearby nature: Affective forecasting errors obscure the happy path to sustainability. *Psychological Science*.

- Payne, L. L., & Schaumleffel, N. A. (2008). Relationship between attitudes toward rural community parks and recreation and rural community satisfaction. *Journal of Park & Recreation Administration, 26*(3).
- Ramey, C. T., Campbell, F. A., & Nicholson, J. E. (1973). The predictive power of the Bayley Scales of Infant Development and the Stanford-Binet Intelligence Test in a relatively constant environment. *Child Development, 790-795*.
- Rideout, V. J., Foehr, U. G., & Roberts, D. F. (2010). Generation of M2 media in the lives of 8-18 year olds. Kaiser Family Foundation
- Royal Society for the Protection of Birds. (2013). *Connecting with nature*. Retrieved February 12, 2018 from <http://rspb.org.uk/connectionmeasure>
- Ryan, R. & Deci, E. (2001). On happiness and human potentials: A review of research on hedonic and eudaimonic well-being. *Annual review of psychology, 52*, 141-66.
- Schultz, P. W. (2001). The structure of environmental concern: Concern for self, other people, and the biosphere. *Journal of Environmental Psychology, 21*(4), 327-339. doi: 10.1006/jevp.2001.0227
- Seltenrich, N. (2015). Just what the doctor ordered: Using parks to improve children's health. *Environmental Health Perspectives, 123*(10), A254.
- Shaw, S. M., Bonen, A., & McCabe, J. F. (1991). Do more constraints mean less leisure? Examining the relationship between constraints and participation. *Journal of Leisure Research, 23*(4), 286-300.

- Tam, K. (2013). Concepts and measures related to connection to nature: Similarities and differences. *Journal of Environmental Psychology*, 34, 64–78.
- Thoreau, H. (1851) *Walking*. Retrieved from <http://faculty.washington.edu/timbillo/Readings%20and%20documents/Wilde%20ss/Thoreau%20Walking.pdf>
- Theimer, S., & Ernst, J. (2012). Fostering connectedness to nature through U.S. Fish and Wildlife Service education and outreach programming: A qualitative evaluation. *Applied Environmental Education and Communication*, 11(2), 79–87.
- Ulrich, R. (2002). Health benefits of gardens in hospitals. Plants for People International Exhibition Floriade 2002
- U.S. Census Bureau. (2017). *American Community Survey 1-Year Estimates*. Washington, DC: U.S. Government Printing Office.
- Van den Berg, A. E., Hartig, T., & Staats, H. (2007). Preference for nature in urbanized societies: Stress, restoration, and the pursuit of sustainability. *Journal of Social Issues*, 63(1), 79-96.
- Veitch, J., Bagley, S., Ball, K., & Salmon, J. (2007). Where do children play? A qualitative study of parents' perceptions of influences on children's active free-play. *Health & Place*, 12, 383-93. Doi: 10.1016/j.healthplace.2005.02.009.
- Wilson, E. O. (1984) *Biophilia*. Retrieved from

<https://books.google.com/books/about/Biophilia.html?id=CrDqGKwMFAkC>

## APPENDIX A

### Survey Instrument

#### Start of Block: First Session

##### **Qa Connection to Nature Survey**

Elizabeth Skinner, a graduate student at Stephen F. Austin State University is conducting a research project in order to better understand the relationships between childhood experiences and connection to nature in adults. Dr. Shelby Laird, Assistant Professor in Forestry is the Principal Investigator. We want to find out about your childhood and current experiences outdoors as well as your current thoughts about nature and being outside. We value your views and opinions on this topic and appreciate you taking the time to complete this 15 minute survey.

Your data will not be shared with anyone and will not be used to identify you during research analysis.

--

I agree to take part in this project which aims to understand connection to nature in adults. I understand that agreeing to take part means that I am willing to complete the survey accurately and honestly to the best of my ability. I understand that any information I provide is confidential, and that no information that could lead to the identification of any individual will be disclosed in any reports on the project, or to any other party. I understand that this research may be included in a research article, but that no identifying information will ever be reported. I also understand that my participation is voluntary, that I can choose not to participate in part or all of the survey, and that I can withdraw at any stage of the survey without being penalized or disadvantaged in any way. I understand that once I complete and submit the survey, I am no longer able to withdraw my participation. ----- We greatly appreciate your

assistance. If you have any questions or concerns about this research study, please feel free to contact Dr. Laird by telephone at 936-468-2014 or via e-mail at lairdsg@sfasu.edu, or Elizabeth Skinner at skinnerek@jacks.sfasu.edu. Any concerns with this research may be also be directed to the Stephen F. Austin State University Office of Research and Sponsored Programs at 936-468-6606.--

**By clicking the Next arrows, I give my approval:**



Q41 Are you a resident of the United States?

Yes (1)

No (2)

Q15 This set of questions ask about your connection to nature.

Q3 **Instructions:** 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.

|  | Disagree Strongly (1) | Disagree A Little (2) | Neither Agree or Disagree (3) | Agree A Little (4)    | Agree Strongly (5)    |
|--|-----------------------|-----------------------|-------------------------------|-----------------------|-----------------------|
| I enjoy being outdoors, even in unpleasant weather. (1)              | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>         | <input type="radio"/> | <input type="radio"/> |
| Some species are just meant to die out or become extinct. (2)        | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>         | <input type="radio"/> | <input type="radio"/> |
| Humans have the right to use natural resources any way we want. (13) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>         | <input type="radio"/> | <input type="radio"/> |
| My ideal vacation spot would be a remote, wilderness area. (3)       | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>         | <input type="radio"/> | <input type="radio"/> |
| I always think about how my actions affect the environment. (4)      | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>         | <input type="radio"/> | <input type="radio"/> |
| I enjoy digging in the earth and getting dirt on my hands. (5)       | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>         | <input type="radio"/> | <input type="radio"/> |

My connection to nature and the environment is a part of my spirituality. (6)

I am very aware of environmental issues. (7)

I take notice of wildlife wherever I am. (8)

I don't often go out in nature. (9)

Nothing I do will change problems other places on the planet. (10)

I am not separate from nature, but a part of nature. (11)

The thought of being deep in the woods away from civilization, is frightening. (12)

My feelings about nature do no affect how I live my life. (14)

Animals, birds, and plants should have fewer rights than humans. (15)

Even in the middle of the city, I notice nature around me. (16)

My relationship to nature is an important part of who I am. (17)

Conservation is unnecessary because nature is strong enough to recover from any human impact. (18)

The state of non-human species is an indicator of the future for humans. (19)

I think a lot about the suffering of animals. (20)

I feel very connected to all living things and the earth. (21)

Q17 This set of questions ask about your demographic characteristics.

---

**Q8 What is your gender?**

- Male (1)
  - Female (2)
  - Other (3) \_\_\_\_\_
- 

**Q10 What is your race / ethnicity? (check all that apply)**

- American Indian/Alaska Native (2)
  - Asian (3)
  - Black/African American (4)
  - Hispanic/Latino/a (9)
  - Native Hawaiian/Pacific Islander (5)
  - White/Non-Hispanic (6)
  - Wish not report (7)
  - Other (8) \_\_\_\_\_
-

**Q14 What is your age group?**

- 18-29 (1)
  - 30-39 (2)
  - 40-49 (3)
  - 50-59 (4)
  - 60-69 (5)
  - Over 70 years (7)
- 

**Q47 Level of education**

- High School Diploma or GED (1)
  - Associate's Degree or Some College (2)
  - College Degree (3)
  - Graduate Certificate or Degree (4)
  - Other (5) \_\_\_\_\_
- 

**Q54 Current marital status**

- Single (1)
  - Married (2)
  - Widowed (3)
- 

**Q39 Are you raising any children under the age of 18 in your home?**

- Yes (1)
- No children in the home (2)

*Skip To: Q16 If Are you raising any children under the age of 18 in your home? = No children in the home*

**Q42 This question will ask you to estimate the amount of time your child spends with electronic devices ("screen time") during regular "school weeks" (Monday-Friday only).**

**In the past "school week" (Monday-Friday only) about how many hours per day did your child spend watching television, playing computer games, or using a computer/smartphone to go online each day?**

- None (0 hr per day) (1)
  - Less than 0.5 hr per day (2)
  - Between 0.5 hour and 1 hour per day (3)
  - Between 1 and 2 hours per day (4)
  - Between 2 and 3 hours per day (5)
  - Between 3 and 4 hours per day (8)
  - Between 4 and 5 hours per day (6)
  - More than 5 hours per day (7)
- 

**Q49 This question will ask you to estimate the amount of time your child spends with electronic devices ("screen time") during non-school days.**

**On a typical weekend (Saturday and Sunday) or non-school day (i.e. summer break) about how many hours per day does your child spend**

**watching television, playing computer games, or using a computer/smartphone to go online each day?**

- None (0 hr per day) (1)
  - Less than 0.5 hr per day (2)
  - Between 0.5 hour and 1 hour per day (3)
  - Between 1 and 2 hours per day (4)
  - Between 2 and 3 hours per day (5)
  - Between 3 and 4 hours per day (8)
  - Between 4 and 5 hours per day (6)
  - More than 5 hours per day (7)
- 

Q59 Check all that apply:

- I allow my children to play outdoors without adult supervision (1)
  - My children are only allowed outdoors when under adult supervision (2)
  - My children play in playgrounds (3)
  - My children play organized sports (4)
  - My children play in unstructured, open areas i.e. abandoned lots and open space (5)
  - Not applicable - I am raising children but they do not play outside (7)
- 

**Q43 This question will ask about how much time your child spends outdoors or in nature ("outdoor time") during school weeks. In the past week (Monday-Friday only) about how many hours per day did**

**your child spend outdoors in nature (in a park, a forest, a backyard or school play- ground with trees, or similar place)?**

- None (0 hr per day) (1)
  - Less than 0.5 hr per day (2)
  - Between 0.5 hours and 1 hour per day (3)
  - Between 1 and 2 hours per day (4)
  - Between 2 and 3 hours per day (5)
  - Between 3 and 4 hours per day (6)
  - Between 4 and 5 hours per day (7)
  - More than 5 hours per day (8)
- 

**Q50 This question will ask about how much time your child spends outdoors or in nature ("outdoor time") during non-school days.**

**In a typical weekend (Saturday and Sunday), or a non-school day (i.e. summer break) about how many hours per day does your child spend outdoors in nature (in a park, a forest, a backyard or school play- ground with trees, or similar place)?**

- None (0 hr per day) (1)
  - Less than 0.5 hr per day (2)
  - Between 0.5 hours and 1 hour per day (3)
  - Between 1 and 2 hours per day (4)
  - Between 2 and 3 hours per day (5)
  - Between 3 and 4 hours per day (6)
  - Between 4 and 5 hours per day (7)
  - More than 5 hours per day (8)
- 

Page Break

Q16 This set of questions ask you about **your** childhood and hometown, which we define as the place you spent the most time in your childhood years (under 18 years old).

---

**Q55 What is the state and country of your hometown? Example: Arizona, USA**

\_\_\_\_\_

---

**Q11 What is the zip code of your hometown?**

\_\_\_\_\_

---

**Q51 What is the name of your childhood hometown?**

\_\_\_\_\_

---

**Q52 What kind of environment was your hometown when you were growing up?**

- Urban - more dense, large population, built up, close together (3)
  - Suburban - not everything urban (2)
  - Rural - less dense, sparse population, not built up, at a distance (1)
-

**Q53 How many years did you live in your hometown?**

- Less than a year (1)
  - 1 - 3 (2)
  - 4 - 6 (3)
  - More than 7 years (4)
- 

**Q16 Were there any buildings with more than 4 floors?**

- Yes (1)
  - No (2)
  - Don't know (3)
- 

**Q15 Were there any parking garages?**

- Yes (1)
  - No (2)
- 

**Q14 Did you live on an unpaved road (not your driveway, but the road your driveway connected to)?**

- Yes (1)
  - No (2)
-

**Q13 How many people were in your high school graduating class?**

- 1-100 (1)
  - 101-500 (2)
  - 501-900 (3)
  - 901-1300 (4)
  - 1301-3000 (5)
  - 3001+ (6)
- 

**Q18 Did you or your neighbors own/operate any heavy machinery such as tractors (that are not lawn mowers) on their property?**

- Yes (1)
  - No (3)
  - Don't Know (5)
- 

**Q26 Did you see a lot of deer or other wildlife in your hometown?**

- Yes (1)
  - No (2)
  - Ocassionally (4)
-

**Q19 Check ALL of the leisure activities you did outdoors as a *child*.**

- Played outside (Unstructured, free play - not team sports) (1)
- Played outside at playgrounds (36)
- Played outside with adult supervision (37)
- Played outside, no adult supervision, no structure i.e. abandoned lots, open spaces (38)
- Walked dogs/pets (15)
- Rode a bike (2)
- Camped (3)
- Went Birdwatching (16)
- Went Skiing (17)
- Went Skating (8)
- Did Yoga (18)
- Hiked (4)
- Went for Leisure Walks (19)
- Gardened (10)
- Hunted (6)
- Fished (5)
- Went Swimming (9)
- Surfed (12)
- Played Team Sports (7)
- Participated in School Classes Outdoors (20)
- Participated in Non-School Classes Outdoors (21)
- Handled Livestock (11)

- Grilled/Cooked Outside (22)
  - Went to Outdoor Picnics (30)
  - Went to Outdoor Parties (23)
  - Went Horseback riding (13)
  - Read outside (35)
  - Photography (24)
  - Painting/Sketching/Drawing (25)
  - Went Rock Climbing (26)
  - Went Boating (27)
  - Went Kayaking/Canoeing (28)
  - Participated in Roadside Cleanups (29)
  - Other: (14) \_\_\_\_\_
- 

**Q32 This question will ask about the amount of "outdoor time" you had as a child during the school week.**

**As a child, in a typical "school week" (Monday-Friday only) about how**

**many hours a day did you spend outside per day (in a park, a forest, a backyard or school playground with trees or similar place)?**

- None (0 hr per day) (1)
  - Less than 0.5 hr per day (2)
  - Between 0.5 hour and 1 hour per day (8)
  - 1 - 2 hours per day (3)
  - 2 - 3 hours per day (4)
  - 3 - 4 hours per day (6)
  - 4 - 5 hours per day (9)
  - 5 or more hours per day (7)
- 

**Q48 This question will ask about the amount of "outdoor time" you had as a child on non-school days.**

**As a child, on a typical weekend or during breaks from school (i.e. summer vacation) about how many hours a day did you spend outside per day (in a park, a forest, a backyard or school playground with trees or similar place)?**

- None (0 hr per day) (1)
  - Less than 0.5 hr per day (2)
  - Between 0.5 hour and 1 hour per day (8)
  - 1 - 2 hours per day (3)
  - 2 - 3 hours per day (4)
  - 3 - 4 hours per day (6)
  - 4 - 5 hours per day (9)
  - 5 or more hours per day (7)
-

**Q45 This question will ask about the amount of "screen time" you had as a child.**

**As a child, in a typical "school week" (Monday-Friday only) about how many hours per day did you spend watching television, playing computer games, or using other electronic devices?**

- None (0 hr per day) (1)
  - Less than 0.5 hr per day (2)
  - Between 0.5 hour and 1 hour per day (3)
  - 1 - 2 hours per day (4)
  - 2 - 3 hours per day (5)
  - 3 - 4 hours per day (6)
  - 4 - 5 hours per day (7)
  - 5 or more hours per day (8)
- 

**Q51 This question will ask about the amount of "screen time" you had as a child on non-school days.**

**As a child, on a typical weekend day or non-school day (i.e. summer**

**vacation), about how many hours per day did you spend watching television, playing computer games, or using other electronic devices?**

- None (0 hr per day) (1)
- Less than 0.5 hr per day (2)
- Between 0.5 hour and 1 hour per day (3)
- 1 - 2 hours per day (4)
- 2 - 3 hours per day (5)
- 3 - 4 hours per day (6)
- 4 - 5 hours per day (7)
- 5 or more hours per day (8)

---

Page Break

Q18 This set of questions ask about your current outdoor activities.

---

**Q31 How many times a week do you go outside for pleasure?**

- 0 (1)
  - 1-2 (2)
  - 3-4 (3)
  - 5+ (4)
- 

**Q34 Do you work outside?**

- Yes (1)
- No (2)

*Skip To: Q35 If Do you work outside? = No*

**Q58 What is your occupation?**

---

---

**Q35 Check all the current activities you do outdoors:**

- Walk the pet (1)
- Jogging/Running (2)
- Hiking (3)
- Biking/Cycling (4)
- Camping (6)
- Birding (7)
- Skiing (8)
- Skating (9)
- Yoga (10)
- Leisure Walks (11)
- Gardening (12)
- Hunting (13)
- Fishing (14)
- Swimming (15)
- Surfing (16)
- Team Sports (18)
- School Classes (19)
- Non-School Classes (37)
- Livestock events (20)
- Grilling (22)
- Parties (23)
- Horseback riding (24)
- Read outside (25)

- Take the kids out (26)
  - Photography (27)
  - Paint/Sketch/Draw (28)
  - Rock Climbing (29)
  - Tubing (30)
  - Kayaking/Canoeing (32)
  - Roadside cleanup (34)
  - Picnics (35)
  - Other (38) \_\_\_\_\_
- 

**Q38 This question will ask about your time spent outdoors now as an adult.**

**In the past "work week" (Monday-Friday only), about how many hours per day did you spend outdoors in nature (in a park, a forest, a backyard, or similar place)?**

- None (0 hr per day) (4)
  - Less than 0.5 hr per day (9)
  - Between 0.5 hr and 1 hour per day (7)
  - 1 - 2 hours per day (1)
  - 2 - 3 hours per day (8)
  - 3 - 4 hours per day (2)
  - 4 - 5 hours per day (6)
  - 5 or more hours per day (3)
-

**Q52 This question will ask about your time spent outdoors now as an adult.**

**In the past weekend,(Saturday and Sunday only), about how many hours per day did you spend outdoors in nature (in a park, a forest, a backyard, or similar place)?**

- None (0 hr per day) (4)
  - Less than 0.5 hr per day (9)
  - Between 0.5 hr and 1 hour per day (7)
  - 1 - 2 hours per day (1)
  - 2 - 3 hours per day (8)
  - 3 - 4 hours per day (2)
  - 4 - 5 hours per day (6)
  - 5 or more hours per day (3)
- 

**Q44 The following question will ask about your amount of "screen time" as an adult during the week.**

**In the past "work week" (Monday - Friday only) about how many hours per day did you spend watching television, playing computer games, or using a computer/smartphone to go online each day?**

- None (0 hr per day) (1)
- Less than 0.5 hr per day (2)
- Between 0.5 hr and 1 hour per day (3)
- 1 - 2 hours per day (4)
- 2 - 3 hours per day (5)
- 3 - 4 hours per day (6)
- 4 - 5 hours per day (7)
- 5 or more hours per day (8)

---

**Q47 The following question will ask about your amount of "screen time" as an adult on weekends.**

**In the past weekend (Saturday and Sunday only) about how many hours per day did you spend watching television, playing computer games, or using a computer/smartphone to go online each day?**

- None (0 hr per day) (1)
  - Less than 0.5 hr per day (2)
  - Between 0.5 hr and 1 hour per day (3)
  - 1 - 2 hours per day (4)
  - 2 - 3 hours per day (5)
  - 3 - 4 hours per day (6)
  - 4 - 5 hours per day (7)
  - 5 or more hours per day (8)
- 

**Q40 Do you want to be more "outdoorsy" but can't find time?**

- Yes (1)
  - No (2)
- 

**Q43 Do you make time to go outdoors?**

- Yes (1)
  - No (2)
  - Occasionally (4)
-

Q44 How often do you visit State/National Parks?

- Once a year (1)
  - Twice a year (2)
  - 3-5 times a year (3)
  - 5+ times a year (4)
- 

Q45 Are you physically able to spend time outdoors?

- Yes (1)
  - No (2)
  - Limited Access (4)
- 

Q46 Is there anything else you would like to tell us about spending time outdoors?

---

---

---

---

---

---

---

---

---

**End of Block: First Session**

---

## APPENDIX B

Unedited Responses to Open Ended Question “Is there anything else you would like to tell us about spending time outdoors?”

1. ....
2. 10 Ways that Spending Time Outdoors Actually Makes You Healthier ...  
Increasing ventilation will help, but it's best for your health to get outside a little bit every day. ... If you're stressed out at home or in the office, it's amazing what a quick walk ... How well you sleep has a lot to do with hormones like melatonin and your own ...b
3. 5 hour
4. 6 HOURS
5. A lot of my time outdoors happen in big bursts during my summer vacations which are usually heavy on hiking and camping in the mountains.
6. Adult onset asthma limits physical activity indoors and outdoors.
7. After moving to a new house without a fenced in back yard, close to a busy main road through town, I don't let my children play outside much at home. We usually go to the local park when the weather is nice though. I wish our home was more "suited" for being outside more often.
8. Age of children is an important consideration re. “Unsupervised play” etc. & independent time outdoors. Kids are 1 & 3, but I foresee increasing time and autonomy as they age.
9. Although I grew up in a big city, I grew up and still live in the Bronx, across the street from a large park, which has raccoons, rabbits, chipmunks, squirrels, and various birds. We used to walk to the zoo and botanical gardens, and live maybe 2 miles from the beach,
10. Always enjoy getting some peace and quiet in nature. Being an introvert to the core, it's something I've always enjoyed.
11. Amount varies depending on the season. Harder to get outside during midwestern winters.
12. As a botanist & Master Naturalist, I teach classes & lead field tips.
13. As a child I grew up in a suburban neighborhood, but there was a vacant hill adjacent to our house. The hill is owned by the state and they were unable to develop on it because of an endangered butterfly. This area allowed me to explore the outdoors as a child and also lead me to pursue a job where i would be working outdoors.

14. As a child I was raised mainly in rural areas in Arizona and Nevada. I roamed free and explored without adult supervision. Built forts, dammed up creeks for swimming, discovered tad poles for the first time. TV wasn't necessary, when you were using your own imagination. My parents maybe did 3/4 outdoor activities my entire childhood. Those few times were my fondest childhood memories. I was drawn to nature and found I could work in the National Parks when I was 21. Worked in the National Parks for the next 12 year's then worked with at risk teens in the wilderness for 5 years. Sadly now I work in a cubicle and physically less able to do the things I use to in the wilderness. I am still drawn to nature and find new less physical ways to enjoy our public lands. Im afraid that our society is constricting children's ability to explore nature freely through new regulations, laws, and too much technology.
15. As a family when we get together we generally stay outdoors for the entire day. We thoroughly enjoy the outdoors just don't have the time anymore.
16. As a single woman, it is very rare I feel safe going outdoors to a state or national park by myself.
17. As a stay at home mom I try and take my daughter out as much as possible. Even in bad weather as I believe any fresh clean air is good air for your lungs. We make it a game every week as to what we find( i.e. Can we find any squirrels today)
18. As I am filling this out I am waiting for our first snowfall. I am retired most of my time if possible is spent Outdoors.
19. As I have gotten older, I've developed more allergies to pollen and mold, which tends to make me prefer to be indoors
20. awesome
21. Because of my childhood being raised in the woods and farm is why I push so hard for children to be outside. I loved to go find a place in the woods and breathe in the air and relax, listening to the sounds of water, leaves crunching, and just feeling the sun hit my skin. All of this makes me feel human again.
22. Being able to travel to "other outdoor locations" is limiting for me. I work in a national park in the desert, and often would like to spend weekends in other areas, but my car cannot really handle the driving, so I am limited in my ability to travel. For me this does limit my access because I would prefer to be in a different area, which is a very privileged position.
23. Being in a conservation corps, heavily effects current stats
24. Being in nature is my zen. It calms me and keeps me amazed.
25. Being in PA, it gets too cold deep in the winter to go outdoors, but in the summer and when we go to Florida in the winter for extended times, I get outside as much as possible.
26. BEING OUTDOORS BOOSTS YOUR ENERGY. ...
27. Being outside makes me happy.

28. Being outside can improve memory, fight depression, and lower blood pressure — here are 12 science-backed reasons to spend more time outdoors. Spending time in forests, hiking in mountains, and just being outside can lead to significant health benefits.
29. Between school and work I find it hard to be outside but I really do love it. I'm majoring in Environmental Science.
30. Birds \*are\* animals! Sorry but it drives me crazy every time I see that and I can't believe I saw it on this survey!
31. Busy busy busy indoors
32. Camping is great fun, but only go when it's cold. There's less mosquitos that way.
33. Can spend as much time outdoors as I I choose and live to. New physical disability is making it a bit more challenging for me to enjoy the outfitted the way I am used to - which is heartbreaking and limiting my joy. Nature and art are my oxygen and a vital necessity fir my mental, emotional, and physical well being. I kust have it to lead a full and enriching life.
34. Chronic low back pain limits my outdoor time more than I like. It also increases my screen time.
35. Clean up more trash while in nature!!!
36. Considerable time outdoors with parents growing up. Limited time as an adult. But I work as a seasonal ranger for the NPS. Earned AAS in Natural Resources
37. Crazy Schedules with work and family activities
38. currently have an infant so unable to take her outside in the cold weather often or for long periods of time
39. depression makes it hard to get out of bed, never mind going outside.
40. Do not enjoy getting out in colder weather (unless on vacation and skiing).
41. During the Winter I usually don't go outside, as I get too cold too fast, and would prefer to be inside. When I was younger I liked playing in the snow, now if I can help it, I don't go out in it. When the temperature is nice outside, I really like being outside. I bought myself a laptop recently, because I want to be able to go outside and do work, as I enjoy being outside, but do a lot a work on my computer.
42. Eagle scout, sick of outdoor time for the sake of it.
43. Eight years ago, I used to be extremely physically active, especially outdoors. I did a lot of solo backcountry camping and hiking, and rode my bike all the time. But then I suddenly got Behcets Disease, a horrible vasculitic disease, along with an aneurysm and a few massive pulmonary embolisms. That curtailed all physical activity for me and completely changed my life. I'm so glad I used to spend a bunch of times in the woods, because I've got all those memories now to look back on.
44. Enjoy nature

45. Even though I grew up in the suburbs, my parents exposed me to wilderness at an early age. This had a lasting, positive, impression on me.
46. Every day! This is what I do! Hike with my dogs!
47. Everyone needs to be outside. Look at the clouds. Look at the birds. Look at the critters. Even look at the bugs! Smell the air! It's different everywhere you go. Connect with nature.
48. Everyone needs to take an interest in our own roles as members and mentors ♥️♥️♥️♥️
49. feel relaxed on that time
50. For a few years, my arthritic left hip has limited the amount of time I can stand or walk. I miss nature so MUCH!
51. For clarification on the question regarding time spent online during a work week, I work 8-10 hours a day on the computer.
52. FYI -Taking this survey at the peak of winter in the northeast - in summer, I and kids are usually outdoors a bit more.
53. get my pet out
54. Get outside and take your kids with you, teach them ethics, common sense and skills that make being outdoors fun.
55. GOING TO PARTY
56. good
57. GOOD
58. Good and interesting moment
59. Grew up in the National Park Service when my dad was with the NPS. Went on and worked as a Park Ranger for 31 years. Raised a family living in beautiful parks
60. Growing up we went on family trips and almost always to parks. It led to the career I have in the NPS.
61. Hard to imagine not having access.
62. hard to talk about the past week when it's the dead of winter, but even so it's been 50 degrees and we have been outside
63. Having to rely on public transport is a major limitation for enjoying nature for me.
64. Highly variable by season. I live in Maine now and it's cold so walks and such are less frequent and shorter.
65. Hiking alone is the closest thing to prayer or seeing a good counselor.
66. Home is outside.
67. How much time I spend outside depends on the season. It is currently winter so I do not go outside a ton, but in the summer I am always outside when I can be.
68. hunting and fishing have gotten too expensive.
69. Hunting for insects is an incredibly fun activity - with all of the emphasis on pollinators and butterflies lately, I suspect that's an outdoor activity practiced more than some of those listed above.

70. I always feel better mentally and physically when I spend time outdoors. I am now retired from the National Park Service and I'm always looking for ways to spend time outdoors weekdays and weekends all year around. I didn't spend more time outdoors growing up because I worked during all 4 high school years. Whenever I did have free time I tried to spend it hiking or swimming or camping. I spent 40 years with the National Park Service and started out as a backcountry Ranger in the Great Smoky Mountains so outdoor time is part of my DNA. And of course being over 60 many of the questions related to screen time didn't apply to me growing up. When I first started working for the NPS there were no computers in any parks - pretty hard to imagine today.
71. I always pick up litter when I spend my time outdoors.
72. I always recommend
73. I am 60 now, and with a broken leg for an car's accident and the other foot is bad. I am an Archaeologist, I used to go to Mexico first, to study and then, to hike and look for Pyramids, I used to spend more than 12 hours per day outdoors, I love it, but aging doesn't allow me to continue.
74. I am a former National Park Ranger. Spent 30 years in the outdoors, and continue to rabidly support environmental issues and protection. Currently a tour guide who takes busloads of visitors through our western national parks, trying to instill some kind of environmental ethic when I can.
75. I am a park ranger. My job varies widely. I can spend 12 to 16 hours outside in a single day, and I can get stuck inside for 8 hours at times. I am outdoors everyday. If I do not get outdoors, I am irritable. I also spend time outdoors at night, especially if I have been office bound all day.
76. I am a ranger in a wilderness park in Alaska, I might be an outlier.
77. I am a runner and would always prefer running outside as opposed to running on a treadmill inside of a gym or home.
78. I am a US citizen but currently living in Croatia because my spouse works in the Foreign Service for the Dept of State. I worked for the NPS for 38 years.
79. I am an old homesteader and feel a close connection to the land and nature.
80. I am in active cancer treatment. When I was doing chemo, I got an infection from an insect bite (we have lots of mosquitoes here and I had to avoid them), and now that I am doing radiation I have to worry about sunburn. I spent more time outside when I was not undergoing these treatments, and I will again when they are finished.
81. I am more oriented to outdoors than indoors. it's 20 degrees so I spend more time in the winter indoors.
82. I am retired and am physically have difficulty walking. I was very physically active in my younger days. My earlier ranger jobs were in the field but

lessso as I progressed up the ladder and then in to management. I have now been retired 22 years.

83. I am very happy
84. i am very happy to spent the time in outdoors because i love it very much
85. I believe that all the time I spent outdoors as a child had a large influence on my love of the outdoors as an adult.
86. I broke my back in a fall on a hiking trip in July. The recovery has been long, painful and exhausting. I will eventually be able to regain most of my outdoor activities but lately I've been pretty home bound.
87. I chose my current job and home in order to allow me to live in the woods, and I've built a trail network in the surrounding hills. But even just walking to the car or letting the dog out, I am exposed throughout each day to unmanaged landscape and wildlife. It's essential to my mental health.
88. I consider time outdoors an important part of the quality of my life.
89. I currently live in a more populated area than I did where I grew up. The difference has been rough. It's not the same going outside here as it was in Wyoming and Montana. It's a little depressing, so it keeps me from going out for leisure.
90. I currently live in Alaska, in the winter outdoor activities can be difficult to do frequently due to weather and extreme cold.
91. I currently live in an urban location for my job and for my partner who is going to school. I am hoping to move to a much more rural place when we are finished here! I am also planning an Appalachian Trail thru hike.
92. I currently live in New York City, so In warmer months I spend a lot more time outdoors in the parks. As I am taking this survey in December, I am spending less time outdoors due to weather.
93. I didn't grow up in a place where we could really be outside year round but I do now and take advantage of it. Weather plays a huge part in how active I can be outside.
94. I didn't go camping until I was 18, and loved it. I wasn't brought up to be adventurous, and feel that lack of training as an adult, sadly.
95. I do go outside to feed feral cats every day and have for years. And I take long walks through the city.
96. I do love outdoors when I get a chance to be outdoors
97. I do not enjoy rain or cold weather and will avoid at all costs. I also have bad allergies during all seasons.
98. I do ride my bike or walk outdoors but the questions here seemed to be in places other than where I bike or walk. I just use the sidewalks or side streets.
99. I do so much less in the winter. During warm weather I get out when ever I can.
100. I don't do winter. It's winter here. I only go out as necessary to run errands, this time of year.

101. I don't have a car and I am unable to walk very well. I am now a hermit who lives in the middle of the city, but I am still outside a lot in my back yard. Between being a child and being a retiree, I was very active outdoors, hiking, boating, camping and all that. I was a mailman for 5 years and walked 11 miles per day in every kind of weather you can imagine. As a child, I lived in farmland and grew up working on farms. I also had a horse, which I rode all over the place. We grew our own food, so there was a lot of gardening too.
102. I don't spend as much time outside as I would like, because of financial restraints and personal situations.
103. I enjoy it
104. I enjoy it when I can.
105. I enjoy spending time outdoors, and have been trying to stay active and get outside as much as possible, but it's not been as easy lately with a 1 year old and living in the frigid midwest. I don't mind the cold weather, but it's not really infant friendly to take a baby out in the cold as much. I still try to get her out when the weather permits however.
106. I enjoy the sights and sounds. Watching birds, squirrels etc... feeling the warmth of the sun and the breeze on my skin. I love looking at the sky, clouds.
107. I enjoy the smell of the outdoors and like the way it makes me feel. If I am feeling down I can just go outside and I feel the difference in my mood.
108. I feel like I would have answered this survey differently dependant on what season it was. Currently I live in Alaska- and it's been below zero for quite a while, I'm not outside as much. Further more, I find that I like I am outdoorsy compared to those I surround my self with, but when I visit my family in Chicago I'm reminded just how much time I actually spend outdoors! Perspective is quite interesting in that sense.
109. I feel like many of my answers make me seem like a contradiction, as I am a vegan with a horticulture certificate who doesn't like being outside. I'm prone to sunburns, which is the primary reason I focus on gardening indoors instead of outdoors. My screentime also seems very high because I'm currently in the process of working on a movie script, so I'm watching a ton of movies for research.
110. I Geo-cache as an outdoor activity that requires you to be physical to varying degrees.
111. I get outside more in the non winter months. My father and uncles we're very big on getting us outdoors and educating us on outdoor skills and science. It has stayed with me always.
112. I grew up in a spartina. Marsh ecosystem. My friends had a boat and we spent a great deal of time in the marsh. I went to NC Outward Bound after high school and became mountain oriented

113. I grew up in National Parks and then worked 40 years as a National Park Ranger. I currently volunteer for several outdoor non-profits.
114. I grew up near a park and greatly enjoy hiking on trails
115. I grew up spending my summers in Yellowstone National Park with my Grandfather who ran a boys camp there from 1927 to 1957. Then spent summers working there eventually becoming a Park Ranger.
116. I grew up the country and love the outdoors and nature. Over some years I let myself get out of shape, but I am working on getting back in shape specifically so I can again enjoy hiking, horseback riding, kayaking, etc. It's a major life goal and I miss it a lot.
117. I had a boyfriend that encouraged me to backpack that influenced me in my 20's. I took a job in my 20's in a park that really influenced me. My main connection to nature as a child was through animals. I had no one in my friends or family that was connected to the outdoors regularly. My father did occasionally take us water skiing, boating and skiing. I think I would have connected easily with modeling of nature connection. (check out [8shields.org](http://8shields.org) and [wildernessawareness.org](http://wildernessawareness.org))
118. I hate cars and don't have a car, so walking around my town sucks for me and I can't easily get out of town to hike or camp at the moment
119. I have a consistent routine of walking for 30 minutes every day outdoors and cannot imagine life without it! Thanks
120. I have a dog and walk her at least a mile every day. Without her, there are days I would never leave the house because I work from home on the computer.
121. I have a lot of work and I do not have time
122. I have been working overtime and it is winter which has cut down my outdoor time. I often feel longing to be outdoors away from people.
123. I have chosen hobbies that require me to be outdoors. Basket weaving, rock hounding, hiking have all become reasons to get outside. Travel choices are also always including outdoor time.
124. I have had health problems in the last few years that have reduced my outdoor time, but that will change as I heal.
125. I have health problems and that is why my time outdoors is limited. I am not suppose to be in the sun much.
126. I have lived in and travelled with a tent.
127. I have no car, so bzzzzt sorry bucko. No real outdoors for you.
128. I have recently developed some severe anxiety about going outside. Over the past three years it has become something extremely scary to me, despite growing up basically outside all the time. I suspect it has something to do with my phone.. coincidentally these fears started and began to grow when I bought a smart phone, and as my time on my phone increased, my fears of going outside also did.

129. I have several during weeks when I spend. good bit of time (3+ hours a day) working outside. Other times I hardly go out at all.
130. I have some mental hold ups about going out into the desert around me and might be moving soon so I will see more nature then in Iowa then in SoCal
131. I just learned about the Screen Time app! Motivated to give the screen up! Now! Thanks for doing this study.
132. I know it is on me to reduce screen time and get more sun time, and I am working on it.
133. I learned to love nature due to school nature walks in grade 1. I wish my kids and grandkids had had that. They only tolerate our hiking and kayaking to make me happy, as if doing me a favor.
134. I like it
135. I like it but developed anxiety disorder. I only go to the forest or for walks in nature alone. I don't think people around me enjoy doing that or understand it. I try to stay unseen and just walk or bike through. My friends know i'm depressed and I think people will judge me for wanting to be alone.
136. I like national parks but the fee is pretty high so that restricts us somewhat because of our budget.
137. I like the outdoors but not in an urban area and I lack the time to make excursions into the real outdoors.
138. I like to spend time outdoors as an adult, but find it harder because of other responsibilities. I do find any excuse I can to go outside such as washing my car, doing yard work, walking to a friends house instead of driving, etc.
139. I listen to music outside. I also write outside.
140. I live in a more urban area now and really only go outdoors during the week to walk the dog.
141. I live in Minnesota, so from mid-November through mid-March I don't go outside nearly as much as in the summer months. It's too cold and I don't participate in any winter sports.
142. I live in northern Minnesota and it is 10 below zero out today and it gets dark by 5:00 pm. In the spring, summer and fall we spend more time outside. In the winter and during the school year our time outside is more limited due to cold weather and darkness.
143. I live in nyc. There are no yards or wooded areas that I can to during normal routine. My child is 3, and her age and our city location also limit the nature she can be regularly exposed to. Finally, it is winter so my answers for the last week reflect cold, rainy conditions not ideal for being outdoors, even though we don't mind weather, it would be different if it were 80 degrees and sunny til 8pm!

144. I live in the Midwest and so I have tried but do not enjoy any winter activities and so it is not fun being outside this time of year. When I lived in the Southwest I was outside much more often during this time of year. I would say that on the weekends in the Southwest I spent 10+ outside on a non-work day and 1-2 on a workday. To me, my time outside is really dependent on the weather.
145. I live in the north, so our daylight is pretty limited right now, and ice is pretty abundant. My answers would be different in a different season.
146. I live in upstate NY so during the winter my outdoor activities are dependent on the weather.
147. I live near a national park and I'm always hiking and climbing. I don't go out tons but I get antsy if I haven't in a while. Here in the desert, summer can be hot and spring, fall and winter are the times to go out, but even winter up in the desert mountains can be cold and it's hard to not be able to go out more during that time. I also don't have friends here so that means a lot of screen time and doing outdoor things alone. The kids like going out though, thankfully. But they can't handle long hikes.
148. I live near a national park and state park with easy access.
149. I live on a large homestead in the middle of a State Forest in NW Oregon, so anytime I'm outside, I'm in the woods, which is what I've always dreamed of for retirement. House is in the mountains, just above a river, got a dog to walk, just need to watch out for the elk, bears & cougars. Life is good!
150. I lived in a national park and was home schooled. Huge parts of my education were outdoors.
151. I lived in a very safe area while growing up and was allowed to go out alone, even after dark. The area I live now is rather unsafe after dark so it limits the amount of time I can spend outdoors.
152. I love being outdoors but right now it is winter and it's in the teens. We are planning to go to a park on Sunday.
153. I love being outdoors, and I don't mind rain, but I hate the cold. On days that I don't go for a walk or something, I almost always go out on the deck and watch for deer and foxes and bring the cat with me so she can watch the birds and squirrels. I love animals and trees.
154. I love hiking with my dog. It's so relaxing and therapeutic.
155. I love it and think it's very important for every human being.
156. I love it, the sound, smells, view, all of it.
157. I love nature
158. I love spending time outdoors, but I don't get to do it as much as I'd like.
159. I love spending time outdoors. I like to go outside with company though. I would like to do more things outdoors but I've been busy. I feel like if I manage my time better, I can go do more outside activities.

160. I love that I get to go outside for work, but I really want to go out more every day.
161. I love the the outdoors, live in the woods, work in the woods and wouldn't have it any other way!
162. I love walking, but health limits me
163. I miss it.
164. I miss not having enough time outside. I really miss hiking. I believe my lack of contact with nature affects my physical and mental health.
165. I moved to CO as an adult (60193 until 21, 61571 21-28, and 80238 28-current/32). My time outdoors has gotten progressively more active and lengthier. I went from reading to running and cycling to climbing and hiking and camping, while still reading and running and cycling. CO has done wonders for my lifestyle, and my mental health.
166. I moved to Oregon just to spend more time outdoors
167. I need more of it.
168. I need to spend more time outside; I feel better when I do.
169. I need to spend time outside every day for self care but it's often hard to find the time, even tho it's a priority to me. I'm a single mom and work full time.
170. I notice that the weeks when I am outside alot at work I am less likely to go out on the weekend especially when the weather is sketchy
171. I prefer spending time outdoors when the weather is nice, but I have found things to do in the snow that can still make it enjoyable.
172. I prefer to spend my time outdoors, even in inclement weather. Being in nature has a way of making me feel better. However, in the last few years, I have had cancer & other chronic illness which affect my physical abilities. I am mostly no longer able to do outdoor "exercise" or "activities", but still try to spend at least a few minutes each day outdoors just sitting or reading/listening to music. Additionally, I have recently move from a temperate, wet, forested climate to a hot, dry, desert climate, which makes it much more difficult for me to spend time outdoors (& personally less enjoyable, as I prefer forests).
173. I presently live in Florida where, for me, the weather is often unbearably hot and humid - this has forced me to limit my outdoor time.
174. I purposely chose a career where my office is outdoors.
175. I rarely go outdoors much at this time of year because it's cold.
176. I really dislike NYC's winter seqson, but when the weather permits, I make it a priority to walk through a park, sit by the river, or just enjoy nature.
177. I really enjoy it and wish I had more time to do so
178. I recently gave birth so this is not my typical life
179. I recently suffered a series of sudden fainting incidents over the last two years. I am no longer able to drive. I have to walk a lot to get groceries

- etc. I miss the forest and walks in the parks near our town but they all require a car to get to them. I content myself with watching the birds in the trees and the pollinators in our garden.
180. I recharge in the outdoors, with solitude, and with beauty. If I did not have wilderness places (such as backcountry areas of national parks) and local nature centers (when home-based), I would not be as balanced and healthy a person.
181. I sometimes wish I could spend all of my time outside. During the summers I do trail work and camp for most of the summer while I am working. But during the rest of the year I find it harder to get outside because of the weather, or because I want to spend time with aging family members who are not as physically fit, or I have to find an indoor job to make some actual money. Everyone should spend more time outside! It will help us really see our impact on the environment and appreciate this beautiful world we live in.
182. I specified all my spending time
183. I spend a lot of time outdoors but not really "in nature"; i.e. bicycle commuting, etc.
184. I spend less time outside in the wintertime (in a colder climate), also because it's dark. I also have a longer car commute than I used to, which takes a lot of time/daylight.
185. I spend more time outdoors during the summertime.
186. I spend more time outdoors during the warmer months, but this past week (since it is the middle of winter) I have not spent much time outside.
187. I spend more time outdoors in summer, winter not as much.
188. I spend more time outside in the summer. But it is winter in Chicago now and it is pretty cold.
189. I spend much less time outdoors in the cold weather than in the warm weather. I hate being cold
190. I spend much more time outdoors during the summer than the winter due to cold temps during the winter. I am a seasonal trail worker, so I usually spend at least 10 hours a day outside while working (in any temp). I am an online college student, so I spend much more time in front of a device or computer screen than I ever have.
191. I spend substansially less time outdoors in the winter months, then on spring and summer months
192. I spent more time outdoors as a child but don't have the time to as much with how busy I am lately. Also I liive in a suburban area now with less access to the nature I used to.
193. I started doing water aerobics because i missed being in the water. Recently discovered two local parks and have been hiking more. 100% needed more nature in my adult life

194. I stay indoors a lot more during the winter months as I'm sure a lot of people do.
195. I struggled with this survey, because it glossed over the impact that weather and seasons change our outside time, both for me and for my kids. When there are 20'+ waves or sneaker wave warnings, we don't go to the beach. When the wind is severe we don't go to the forest. When the days are short and the sun is only just coming up when the kids go to school and sets shortly after they come home we do less outside stuff. On the other hand, when the days are long we spend more time outside. As a child, during hunting season and now during mushroom season we spend more time outside than at other times (my 5 year old is a budding mycologist and my 4 year old is a food snob, so mushrooms are a huge thing.) I also vouched only for my kids outside time when they are with me, but that was a factor in selecting which school my kids attend. It occurs to me that this survey also doesn't address mutli-household kids - I know several children with divorced parents who do almost exclusively outdoor time with one parent, exclusively screen time with the other. On a side note, as someone who sees no harm in raising kids with a childhood mythology to be debunked as adults, we created our own to help address the desire for screen time both for our kids and our friends' kids, nieces, nephews, etc.: All the kids we know kids are convinced that our screens are a special kind of solar powered. When the sun is up they have to charge, and they can't run when they are charging. ;) It is a mythos we started a decade ago for a screen-driven nephew, long before we had kids of our own. The kids in our family and social circle have continued it among themselves, teaching the younger kids, at first deliberately and then with a wink (once they realize the gig, much like with Santa). Battles over screen time that are regular occurrences in other homes don't happen here, because the kids are so convinced the screens just don't work - they don't even ask for it. Yeah, it's a myth, but while they be
196. I studied zoology in college. I miss studying and observing animal life for scientific study. I wish there wer a way to participate as an educated amateur.
197. I take a break from working at home on my computer to step outside to feed my stray cat and to get some fresh air. I also sit in the carline with my window down on my car when it is not raining to enjoy the outside weather while sitting in my car. I really do have the time, because of my work on line during the day.
198. I take a walk outside nearly every morning (weather permitting) for relaxation, leisure and exercise.
199. I teach at a nature based middle school in Charlotte m, NC called Pioneer Springs Community School where we strive to nurture our students' connection to nature.

200. I teach. On summer vacation I HAVE to go to the wilderness in order to recharge.
201. I tend to head outside on purpose when I need to 'recharge' and it always involves unplugging from devices at the same time
202. I tend to like spending time outdoors in warmer weather (even if raining), but have a really hard time getting outside when it is cold and snowy.
203. I tend to spend more time outdoors during the spring, summer, and fall versus the winter months.
204. I think all of the time I spent outdoors in the woods and fields around our farm was what connected me to wildlife and domestic animals. I spent most of my time in the company of animals and that connection has held for 60 years.
205. I think the single largest influence on me loving the outdoors is that I was in Girl Scouts as a kid and we always camped, hiked, fished, etc.
206. I think it good for my mind, The fresh air and being part of nature it just feels natural.
207. I think your "regardless of weather" is a bit silly. I can love nature without wanting to go outside when it's cold and pouring down rain!
208. I usually spend more time outdoors but it's a cold rainy period.
209. I usually spent 2-3 hours outdoors during the work week and 4-5 during the weekend as an adult. It just happens to be cold and snowing out where I live at the moment.
210. I usually try to get outside to hike or just enjoy being outdoors on my local trails but it is hard to as an adult whom is very busy in life.
211. I very much miss the ability/time to explore the outdoors like I did years ago.
212. I walk 2 miles, in my neighborhood, every day.
213. I walk a lot, hardly drive so I walk everywhere I need to go for errands.
214. I walk outdoors every day. I have a national park( The Buffalo National River) about a mile away and visit 3-5 times a week.
215. I want to go outdoors ideally, but I suffer from anxiety and depression and I use that as an excuse to stay inside currently.
216. i was spend more time with my friends.
217. I was the oldest in my family. For the first 4 summers of my life we lived in a tent while my dad did research at Isle Royale National Park. My youngest sister is 16 years younger than I am. She has never been camping with my parents. My husband's oldest brother remembers camping with their dad. My husband, as the third child, never camped with his dad. Based on these two experiences, it seems like the age of the parents might play a role in how much exposure kids get to nature.

218. I wasn't sure how to answer the current screen time question—I work at a computer all day, so I'd say I spend 5+ hours of screen time/day Mon-Fri, but your question asked about watching TV (I do not have one), playing computer games (very rarely, and only on my phone), or going online (while I definitely check email and social media during the course of my work day, a lot of what I do doesn't necessarily require the Internet, although it is on my computer—Word, Excel, etc.) Taking that into account I estimated a lower number, but please feel free to adjust upward of it better reflects time in front of a screen.
219. I wish I could have more time to spend outdoors.
220. I wish I could make more time for it, but it always seems to get pushed aside.
221. I wish I could spend more time outdoors but it is tough after work because I am tired and I don't have things to do outside on The weekend.
222. I wish I didn't have to work so much. I would go out more also, if I had a car.
223. I wish I got into spending time outdoors younger in my life. I hope that children get the time to connect in nature to develop a relationship that will last a lifetime. We need to prioritize preserving areas for all to enjoy the outdoors
224. I wish I had more free time for it
225. I wish I lived closer to nature, it's a long drive to get away from the city.
226. I wish I spent more time outdoors.
227. I wish there was a state park closer to where i currently live. The closet one is 20-25 mins drive away from where i live.
228. I wish there was more time in the day and less time spent at work. This would allow me to spend more time outside.
229. I work a non typical work week Saturday through Wednesday. I work in a national park so I go to one a lot. I'm also able to go for walks and hikes after work.
230. I work for NPS so your questions don't all fit. Also I think your questions in some cases are biased considering you posed the study to NPS employees at least on Facebook
231. I work for NPS.
232. I work for the National Park Service and spend a fair amount of time outside during April - October, less so with colder temperatures. I enjoy being outside, but not during storms or inclement weather events.
233. I work with a computer, so that time I gave might be skewed a bit
234. I worked as a Park Ranger both at the State level and with the National Park Service. Hunting and Fishing was a big part of my life and taught me a lot of valuable virtues such as patience and respect for wildlife.

235. I worked outdoors for most of my life, for the Boy Scouts, nps, agricultural museums, county parks. I'm not currently.
236. I would like to do more but it seems farther and farther away.
237. I WOULD LIKE TO SPEND MORE TIME OUTDOORS, BUT WE HAVE A LOT OF COLD WEATHER IN THE WINTER AND FALL PLUS I WORK A LOT.
238. I would like to spend time outdoors but the area I live doesn't have good access to parks or recreational places without having to drive. Too much car focused society/community where I live.
239. I would love to spend more time outdoors, but work can be time consuming.
240. I would rather be outdoors than indoors. I love eating outside and do so as weather permits. Your questions do not consider climate which obviously affects outdoor participation. And, I'm retired so your "work week" questions were a little confusing.
241. I would spend more time outdoors if I wasn't working 2 jobs
242. I would spend more time outdoors if my husband were more mobile.
243. I...just wish I could do it more when it doesn't involve my commute.
244. i.ve always been an outdoorsy kind of person
245. I'd like to spend more time outdoors.
246. I'm a long distance hiker/backpacker, my extended time outdoors (multiple days or a week+) is how I recharge. We were made to be outside, it's good for us.
247. I'm embarassed to say that I spend less time outdoors now that I'm retired.
248. I'm not spending as much time outside right now because the weather is cold and rainy
249. I'm retired, so "work" is NA. Spend a month in wilderness every year, caretaking a historic cattle ranch. Active in local land use & conservation. One adult child works in wilderness.
250. I've found that I spend less time outside as I adjust to living somewhere with an actual winter (temperatures below 40 degrees), as opposed to where I grew up (temperatures maybe below 70). I tried to base my answers on my fall/spring/summer activity levels.
251. I've lived and worked for Grand Canyon National Park for 36 years. Having the Canyon as your back yard and playground how can one not love the outdoors?
252. I've never really gone outdoors that often, unless I need to do something out there. I guess it's not really a leisure activity for me.
253. I've noticed lately that the way I spend time outdoors is not my ideal. I live in Denver right now and most of my outdoor time is in an urban/suburban landscape. Yes, Denver is home to many parks and I

enjoy spending time in the parks sitting in the grass or climbing trees, but it's a very different experience than being out in the woods like I've been able to be during SCA and AmeriCorps programs. At most parks I visit in Denver, the sound of cars is so overbearing that it almost takes away from the experience. When I'm not bombarded by the sound of cars, I think I feel more of the therapeutic benefits of spending time outside.

254. I'm a retired NPS employee, but was a desk worker. Love the NPS sites and retired right next to the Petroglyph's NM.
255. I'm a wildland firefighter; my outdoors time varies wildly depending on the time of year, how busy a fire season we have, etc. Even with this job, though, I find myself spending too much time in front of a computer or iPhone when I could (& should) be outside.
256. I've been a federal park ranger for 25 years, based largely on my access and love of a ranch my family had and access to nearby parks and open areas as a child. As we grow our cities, parks and open spaces are more vital to have in every neighborhood regardless of wealth. I'm also as a "city girl" a little afraid to be in truly wild areas alone. Education and familiarizing all kids with outdoors early so they don't fear being in outdoors is critical. Good luck on your study, and don't let the trumpians/shutdown kill your morale. The 2013 one hurt me a lot!
257. I've loved working outdoors, but in my field, jobs are often seasonal. My current work in a big city has programs to encourage wellness.
258. I've spent 10 years documenting climate change in national parks. The environmental degradation is noticeable & alarming.
259. If time allowed I'd be outside everyday. With work and family obligations it's gotten really difficult.
260. If you spend more time outdoors, it becomes easier and more desirable with more time. I spent every day outdoors 24 hours a day for three months and I didn't mind cold or hot in the same way after. I miss that time.
261. In the past few weeks I have been physically unable to go outside.
262. IS SHOPPING
263. is very good all
264. It always has a positive effect on me.
265. It can heal you.
266. It centers and calms me
267. It depends on the season and weather
268. It feeds my soul
269. It has been a very severe, rainy, cold season here for months! Even my friends who are really outdoorsy types are finding that this year has been the worst for outdoor activities. We do what we can with a 75% chance of rain or snow!

270. It is how I prefer to spend leisure time.
271. It is incredibly rewarding when we have the opportunity.
272. It is inspiring
273. It is my lifeline in this hectic world.
274. It is necessary for my well being.
275. It is the end of December, so I have not been going outside very much. In the summer, my kids and I both would be outside a bit more, but still not a huge amount.
276. It is where there is the most peace.
277. It is winter and my children are very young... My answers would be different in summer and when they get slightly older...
278. It is winter and quite cold where I live I answered for now in winter I spend much more time outside In spring summer and fall
279. It took me a long time to really feel comfortable in the forest and places where are live now. But it's precious to me and I'll never be without my time in nature.
280. IT WAS A WONDERFUL WAY TO GROW UP SO MANY THINGS REVEALED ITSELF THAT I DO NOT BELIEVE EVERYONE WANTED TO SEE OR SAW.
281. It would probably do a lot of people some good to spend more time outdoors instead of inside staring at their phones or playing video games.
282. It's a spiritual experience for me.
283. It's been cold and rainy lately so I haven't been able to be outside as much.
284. It's cold right now which affects my answers.
285. It's good for your soul
286. It's hard to calculate on a weekly basis -- last week was Christmas, for example. Some weeks in the summer are spent almost entirely outdoors; others, not at all.
287. It's hard to find good places to spend time in nature in New York City.
288. It's harder to enjoy the outdoors where I currently live. It's a very urban area and it's not as enjoyable or as safe to be outside as it was when I was a child.
289. It's important to me to get outdoors every day, even if it's just walking to work/school (I am a graduate student and I live about 1/2 mile from the university where I study). I also live in a northern climate now, and daylight is limited in the winter, so when you ask about 'every day', what I've given you is actually more of an average over the week or weekend. In the past I have worked outdoors all year round, for many years (taught skiing for 25 years, worked as a landscaper for 5+ years, taught outdoor science summer camps for 10+ years). I don't do that now,

since I'm a student, but I plan to spend much more time outdoors when I finish my E. D. in May.

290. It's mind is peaceful to spending time outdoors
291. It's my favorite thing to do.
292. It's nice out there.
293. It's not particularly weather-appropriate for me in this season.  
Outdoor activity will have a place in my plans once I'm equipped to defend myself against nature. In other words, I still want my luxuries. The added bonus of knowing how to survive and simply appreciate what we have at our exposure intrigues me and I do believe time spend there will be worthwhile considering that.
294. it's really enjoying
295. It's so hard to do outdoor activities since NYC isn't very conducive. But I try my best to get some time outside and make sure my son does as well.
296. It's very seasonally dependent. As a child, I'd be outside for hours in the summer, but not much at all in the winter.
297. It's vitally important to me, but economic issues force us to work too much to be able to spend much time outside.
298. It's winter in Montana so I've been outside less in the past week than I would be in the summer.
299. It's Winter, which should skew your numbers towards screen time over outdoors.
300. It's become more of a luxury than anything else. I cherish my time outdoors, even though it doesn't happen often
301. It's my church
302. It's super important for parents to instill a love/appreciation of the outdoors in children - esp for those in urban areas. I was raised going to Valley Forge NHP on weekends for family walks. So it seems natural now for me to go out into near by open spaces to walk/hike. My parents never took us camping but I did it during summer camp - though it was not something I continued into adulthood - except for a season in the backcountry office at GRCA. Being outdoors does not have to be about technical rock climbing or Packing in to camp including wilderness areas - but getting away from screens and urban/suburban noise to see the flora and fauna or learn about the historical aspects of a location
303. It's the desert so sometimes it's just too damn hot weekdays. In the summer we go out at 6 or 7 to beat the heat, or we used to but I take care of my mom now so I get out less.
304. It's winter in rochester so this survey is a little skewed because it's so cold
305. Its a very Happy Moments to me.
306. Its cold here right now

307. Its enjoyable and helps you relax, everyone should try to get outside whenever they can.
308. jogging, watching TV outdoors( out-door cinema)
309. Just remember to diverse your audiences. Inner city, schools (k-12), asking a park ranger fb page is gonna get you some defs. Don't be bias, and a huge part of environmental interaction is spending it with others which I didn't see any questions based on that...who you hang out with, do friends make you, reasonings. My Environmental college was 90% white kids, all from good homes, and not from heavy cities....the values in cities and the privileges available there do not generate the same level of value in nature...it's very self individual survival vs the collective and nature. A cool story I read once was during the 1991 or something blackout in LA, CA....tons of people were calling 911 freaking out, not about the blackout but thinking there were UFO's in the sky because they've never seen stars before living in the city 24/7.
310. Just that past weekend questions responses are strongly influenced by the fact that it is presently winter and the holidays! Dine outside for lunch whenever possible. Nature has a spiritual component that is calming and essential for me.
311. Last week I was sick, so more time inside. Live half the year now in FL (leave NH in late Jan - early Feb & return to NH by July 4, so easier to do bicycle & kayak & walks every day in nearby natl wildlife refuge), when in NH in summer & Fall (when not on internatl trips- much walking), I walk, kayak & bicycle & take trips to the mts to go cross-country skiing). Sometimes the weather is too nasty at the coast in NH to do much outside. Stuck inside sometimes when paperwork needs to be done: insurance claims, investigations (had dock & walkway STOLEN by FEMA-paid contractor under cover of hurricane) or when sick...
312. Lengthy work hours and commutes prevent me from spending time outdoors. Unfortunately, any time outdoors would still mean being in an urban environment with little to no access to any real greenery.
313. limited access during the winter months due to cold & snow
314. Living in Maine spending time outdoors varies greatly by the season. It is not always a weather issue, but rather the length of daylight is an issue. I walk all year as I am near the beach and thus can avoid slippery trails/sidewalks. Unfortunately many outdoor activities like swimming, gardening are limited to 3 seasons, at best.
315. Living in NY in the winter, it's hard to spend too much time outside personally.
316. Looking forward to retirement so I can enjoy more than vacations and summers in the wild. Just finished the SCI Wilderness Leadership School last July. Was environmental educator of the year for my state in 2005.

317. Love the Fresh air and it makes me relaxing and happy
318. love the outdoors, interesting
319. Love them!
320. love to wrk inmy garden
321. Love walking under trees. Seeing red tail Hawks soaring, and hearing migratory birds fly over.
322. Many of our local outdoor recreation areas are severely overcrowded which discourages me from visiting them.
323. Many of these questions asked about, "in the past week." It's the holidays in December in the Midwest. During the Spring/Summer/Fall seasons, we're outside daily, but when it's wet and cold during the winter, we tend to stay inside.
324. Maybe I'm not representative in this survey. I farm.
325. More restricted now that I am disabled from a caving accident.
326. Most of the time I spend outdoors is doing work. Because of that, it's not where I relax most of the time.
327. Most of us these days live a fast-paced, technology-packed lifestyle. Between work, the commute, taking care of the kids, cooking and cleaning, watching television, connecting on social media, and more, we're spending an average of 90 percent of our time indoors.
328. movies
329. Moving from just outside New York City to Bellevue right before my 11th birthday in 1960 was huge in creating my love of the outdoors. I was amazed by views of Mt Rainier, the Olympics and Cascades, and went camping with Girl Scouts and my family for the first time. After moving to Vancouver in 1963, I hiked with Scouts near MtStHelens, and then spent 3 summers as a church camp counselor near Mt Hood. In college I spent 2 summers working at a camp on Spirit Lake (before St Helens blew) and I was totally hooked!
330. Much of my youth and adult time outside has been through Scouting, USA
331. Much of our time now is spent in city and county parks. Though there weren't many opportunities for outdoor activities in my hometown as a child, we spent one week each summer in Rocky Mountain National Park, which shaped my attitude towards conservation. I also worked in environmental protection for close to a decade.
332. My answers about this past week going outside are affected by weather- it's pretty cold in Connecticut right now but not snowy enough for skiing so I feel relatively limited. Additionally, there's not a lot of daylight right now, it's currently dark outside by 5 pm so that affects my outdoor activity. But I like it and wish I did it more!
333. My answers would have been different if I had taken the survey in any season other than winter.

334. My child has special needs. That complicates her outdoor time and requires adult supervision. You might want to consider that category in your data analysis. With the rising rates of autism and other developmental disabilities, you may see a correlation in necessary supervision of outdoor activities and use of technology as a coping tool!!! Also, a LOT of my outdoor activities in my childhood were through the Girl Scouts. I tried to do GS with my daughter, and all they seem to care about in our area is tech! Not what we're looking for. I would LOVE to get my daughter out in nature more! I take my students outside daily!!!
335. My children attend an outdoor preschool one day a week. Considering outdoor kendergarden.
336. My current career choice has brought me indoors and I regret it. I want to spend more time outdoors but my mental health and company I keep reduces the amount of time I spend being outdoors in the manner I wish to spend time outdoors. I need to get new friends.
337. My family started camping when I was nine years old, and we camped every summer for at least six or seven years after. Mostly we camped at Twin Lakes and Lost Maples, both in Texas. I think I have a greater appreciation and understanding of nature because of those camping trips. I love nature photography, and I do try to find time during peak seasons to go outside and take pictures. And sometimes when I need to get out of the office, I'll go for a walk with a camera and take nature shots for 30 or so minutes. My job requires me to be creative since I'm a graphic designer, so getting outside helps open channels of creativity in me.
338. My father worked for the Bureau of Land Management, and the town where I grew up had a state Park we would visit at least once a week. You could ride your bike across town in three minutes. Nature wasn't a choice, it was all around.
339. My grandparents had a farm as a kid we spent a lot of time there. I live on an island now - rural, surrounded by woods.
340. My husband and I spent many hours outdoors visiting state and national parks. Since he passed away, I no longer spend as much time outside.
341. My job can take me to places where it's harder to be outside. But I prefer to be outside whenever possible.
342. My job with NPS requires me to spend time outdoors.
343. my kids today spend half the time I used to spend playing outside
344. My outdoor experiences as a youth inspired my career choice to be a Ranger. Thanks mom and dad...it made a huge difference.
345. My outdoor vs. electronics balance is very skewed for the past week due to holiday travel. In general, I spend at least 4-5 hours outdoors per day, and no more than 1 hour by the computer or TV.

346. My outdoors time as a child was greatly influenced by the weather. In the summer, I would spend the better part of a day outside (unstructured free play/using imagination with siblings) but in the winter, I wouldn't spend much time outside at all!
347. My parents took me camping from the age of six months on.
348. My past week and weekend numbers are skewed because I was at my Grandmother's house for the Christmas holidays.
349. My screen time during weekdays may be skewed from the norm, because I am an IT Manager. I sit in front of a screen for 8 hours or more each day. I would love to do some of my work outdoors, but that just isn't possible at this time.
350. My screen time has everything to do with my "job". I work online, and run 2 brands online 7 days a week. Allergies prevent me from getting out as much as I would like, but that is why Arizona is my favorite place I have ever been. The tv was the only screen at home or school when I was young.. screen time was hard to get too much of.
351. My time outside during the past few weeks would be higher but we've had an extreme amount of rain, and I've got a very old dog--she can't really take the cold/wet conditions well any longer. Otherwise, we'd be outside a lot more! Being outside in nature is effectively a religious experience for me.
352. My time spent outdoors changes seasonally. I spend much more time outdoors (and away from screens) in summer than in winter
353. My winter outdoor activities are significantly reduced by the cold weather in comparison to the other seasons of the year. I spend a lot of time outside when the weather is suitable for golfing and hiking.
354. My work setting is in a preschool. Although I don't work outside I take every opportunity to show the children nature and share with them activities such as feeding birds. The change in their behavior and demeanor is priceless as they are engaged and actively seek out the activity at every opportunity.
355. My work week is more than 10 hours, I leave at 7 am, get home at 7 pm. Weather is a factor on how much we go outside. Fall and spring see a major increase in how much we are outside. When it's too hot or cold we stay inside more. The children must be partially supervised due to location and crime rates.
356. n
357. n/a
358. N/A
359. na
360. NA
361. National Parks should be preserved
362. Nature is the best medicine.

363. Need to stop charging people to use parks. Families cannot afford it. Government is horrible at managing resources, especially money.
364. Never regret going once there!
365. nice
366. NICE
367. Nice moment and like the feelings
368. nice study
369. nice survey
370. no
371. No
372. NO
373. no comments
374. No comments
375. No matter the weather, good or bad, being outside relieves stress and improves my mood. I feel re-centered after being outside. I work outdoors about half my work time.
376. no more comments
377. No other comments
378. No thank you
379. no thanks!
380. No thanks.
381. No there were explained all
382. No,
383. No, thanks.
384. No, there's nothing further that I'd like to add at this time.
385. no, very good survey. The outdoors is great and creates a lot of fun things to do.
386. No!
387. No.
388. No. Thank you!
389. none
390. None
391. None.
392. nope
393. Not enough hours in a day!
394. Not particularly
395. not really
396. not really, its fun
397. Not that I can think of
398. nothing
399. Nothing
400. NOTHING
401. nothing at all

402. Nothing comes to mind presently. The questions are pretty thorough
403. Nothing comes to mind. I enjoy being outdoors and doing activities with my kids.
404. NOTHING ELSE
405. Nothing further
406. nothing I can think of
407. nothing..
408. One of my goals for 2019 is to spend more time in nature I really enjoy it I'm just lazy :)
409. One of the aspects of outdoor time not covered was the time spent taking care of property such as mowing lawn, raking leaves and other duties. Time is spent in those activities outdoors that is more work but can also be enjoyable time in nature.
410. Only that the viewing habits are vastly different from when I was a kid until now because there is more of a selection on TV now. One of the reasons we didn't spend a whole lot of screen time growing up ('60s and '70s) was because there just wasn't much to watch back then.
411. Other factors that impact the amount of time I spent outdoors are season/weather (I hate the heat), the amount of daylight time, easy access to nice outdoor spaces (including a porch), and having people around who also want to be outdoors. I also spent a lot of time outside when I had a dog, which I don't anymore.
412. Outdoor time is much more limited by climate now than when I was a child in Indiana.
413. Practice yoga and meditation in an outdoor environment.
414. Probably not the most typical answers as my past week was Christmas break and there has been a lot of rain and mud. The questions did not ask, but my kids don't go outside alone because they are 2 and 5. That could change as they get older, but for now that decision is solely based on their young ages.
415. Re questions on weekdays/weekends: I am retired! So, no difference (and no place to state that). Have two border collies - MUST get outdoors most every day!! Childhood: father ran a native plant nursery on our property, so I was outside a lot with him. Also spent a lot of time in a nearby national park as a child; then became a National Park ranger!
416. Recently due to the fires, our trails were all closed. I noticed a significant negative impact, felt almost depressed. While I realize some of this was post traumatic, I also was suffering the loss of something I do three days a week for at least two hours each time. I, along with my partners in crime, started sneaking onto the trails, even though they were still closed. Amazing how I almost instantly began to feel more like my

self. The trails provide a physical benefit, but the mountains are my place of spirituality as well.....I need to be there....need to see the return to life.....to feel the peace offered me there....

417. Recently we have not gone outside so much as it is cold outside.
418. Right now my grandchild is 2 yrs old as he grows we will be spending more time doing outdoor events and going on little adventures!
419. Right now not as much time outdoors as it is winter and yucky outside.
420. Right now, I spend less time outdoors because it is winter. During the summer, the time I spend outdoors increases greatly.
421. Screen time now is mostly because I'm a software engineer (after a very sheltered and tech-influenced childhood). I don't often do screen-based activities for entertainment, other than keeping up with news and research.
422. Seasons and weather matter. In colder or wetter periods my outdoor time drastically decreases, whereas when it is more comfortable and temperate outdoor time greatly increases.
423. Since I am currently in grad school, I don't spend as much time outdoors as I used to. I am hoping this will all change after I graduate!
424. Since October 2018 I have been living and working in McMurdo Station Antarctica so at times the weather is so severely bad that outdoor travel is restricted and it can be so windy and cold that outdoors activities are miserable despite proper clothing. This causes me to spend more time inside than outside than I normally would.
425. Since retiring ....our "outdoor" time is very seasonal. In the winter, we are snow birds and spend a lot of time outdoors. During the summers, we also spend a lot of time outdoors. In fact, since retiring we worked for six summers as seasonal Park Rangers. But....in the spring and fall....we don't spend as much time outdoors.
426. Some is weather and work schedule dependent, shorter winter days, etc. Also my work is 70/30 indoor vs out. I work in Interpretation management at a national historic site.
427. Some questions are limited to "last weekend" but my last weekend was below zero and very windy with lots of wind chill, so the answers may depend on when the questions are answered and the location (cold or hot, summer or winter, etc.).
428. Source of energy and rejuvenation.
429. Spend more time outdoors when there is more light and warmer weather
430. Spending time in forests, hiking in mountains, and just being outside can lead to significant health benefits. Studies have shown that walking in the woods can improve blood pressure, boost mental health,

and decrease cancer risk. So go spend some time "forest-bathing" to improve your health.

431. Spending time outdoors is a great way to unwind and relax.
432. Spending time outdoors is beneficial for mind, body and soul. Lifestyles need to revolve around this truth. Americans need to opt for living in walkable neighborhoods, using mass transit, leaving the car behind. We need to restructure our infrastructure to accommodate these needs...create easy and safe walkable neighborhoods, create easily accessible and efficient mass transit systems across the country, change the acceptability and status of solo driving a car to everything, even when walking is available. The overall mental and physical and spiritual health of our people will greatly improve if we make these changes.
433. Spending time outdoors is good for my physical, mental, and spiritual health. I feel more at home outdoors than I do inside.
434. Spending time outdoors is nice when the season is right.
435. Spending time outdoors is season dependent-if it were April-Oct I would have answered these questions differently. The kids in the household are grandkids. In summer they are outside all day-9-5. Spring & Fall weekdays 3+ hrs outside.. Winter sports are indoors which limits available time for outdoor activities. They visited 7 nat'l parks/monuments in the past 18 months. I visited 8 Canadian NP & 6 US parks in the same time period. Also the only screen I had when growing up was a TV with 5 channels. I spent summers & winter weekends on a lake in rural WI which your survey doesn't capture and probably influenced me more than my suburban hometown/school. The Grandkids use iPads and chrome books at school (they are 7&9) I didn't include that in the estimates here as I assumed you wanted leisure screentime? We live now on 10 acres in the woods. Good luck with your research
436. Spending time outdoors is usually dependent on weather. In extreme heat or cold, I am not as interested in spending time outdoors.
437. Spending time outdoors makes me feel closer to God. It relaxes me and renews my spirit.
438. Spending time outdoors minimizes anxiety and increases emotional awareness.
439. Spending time outdoors was something I deeply connected to in high school after my parents started taking my sister and I on walks at a local state park and nature preservation area. After that it became an integral part of me and I dove into hiking and backpacking to the point where I studied outdoor recreation for my undergraduate degree.
440. Spent a lot of time camping as a child. I was a park ranger for a season, did environmental edu for a season, then trail work for a season. Currently I am a counselor/guide for a wilderness therapy program in south east alaska. With all this time spent outdoor, I feel a bit burnt out.

I've learned how to respect natural (especially Wilderness) from far, but indoors. The easiest way for me to not leave an impact is to leave it untrammelled.

441. Stuck in a desk job.
442. SWIMMING ,TEAM PLAY
443. thank you
444. Thanks for reminding me to make time!
445. Thanks very much!
446. The age of our children prevent us from doing some activities but we hope to incorporate more outdoor activities as they grow older and can be a bit more independent.
447. The only reason I don't currently spend time a lot of time outdoors is because I recently gained a lot of weight and I am so uncomfortable walking around! Nothing fits me. If I was back to a much smaller weight, I could picture myself a lot more out in nature.
448. The question about screen time during the work week could be clarified - does this include time spent working on a computer? Answering emails, data entry, research, budgeting, scheduling, etc.
449. The screen time question did not account for screened duties I have as part of my job.
450. The seasons and weather can greatly change the amount of time we spend outside. It snowed 13 inches a couple weeks ago.
451. The shutdown has increased my ability to spend time outdoors which has altered my answers to some of the above questions.
452. The weather in the city where I currently live influences the time I spend outdoors as it is currently winter. In warmer weather and seasons that aren't winter, I spend a great deal of my time outdoors, more so than right now.
453. The weather plays a big factor in whether or not our family goes outside. During the summer months the kids are outside much more.
454. The world isn't as safe anymore. I'm a petite person and do not feel comfortable being outside
455. There is a decent amount of nature areas where I live, so I do get some hiking done from time to time.
456. There is a small park close to my work office. When the weather is nice I try to walk over there every day.
457. There was a small wood right next to my house when I was a kid. The neighborhood kids were not allowed to go in there but we all went in there anyway. There weren't actually any large animals in there since it was basically surrounded by the town and wasn't large. Not I live in a city. I don't even know where to go to find nature here. This isn't like New York where there is a large state park.

458. This last week has been snowy and really cold in my area so haven't spent much time outdoors. In summer I typically spend all day in the yard, or taking my kids and their on outdoor adventures. Unfortunately my kids do spend a lot more "screen time" than I would like.
459. This last week was Christmas so not a typical week as I spent more time inside with relatives than I normally would.
460. This particular time of year, winter I don't go out as much as other seasons.
461. This survey doesn't take weather/time of year into consideration. I spend an average of 4 hours a day outside when the days are long and 1-2 hours when the days are short.
462. This survey is reminding me to go outdoors more often and to take my kids
463. This survey reminds me how much the outdoors means to me. I'll make a point to spend more time there!
464. This survey was done during the winter, over the holidays. During the spring, fall, and summer much more time is spent outside by my all in my family.
465. Time outdoors depends on weather. I am retired and physically challenged or I would spend more time outside. Tome outside is a great anti depressant
466. Time outside this last week might be a little skewed, as it's been very cold and snowy! During the summer, my time outside for pleasure is 3-4 hours a day. I also work as a backcountry Park Ranger so am outside for 100+ hours a week during the summer. ;)
467. Time recorded in the survey Dies not differentiate between summer and winter months. Winter months are too dark here to spend much leisure time outside.
468. Try to spend as much time as possible with my grandkids outdoors but only see 4 or 5 times a year.
469. Unstable work schedules can make planning meaningful outdoor time a challenge
470. Usage is low right now due to cold weather and very short days. As days lengthen, we'll be outside more.
471. Using the "last week" may bias thus study since it is winter also holiday season hope this survey is longer. I think travel for outdoors would be good to consider. My holidays are 98% based on outdoors opportunities whether nature watching hiking water sports hiking or beach time
472. usually go outdoors when going to gym or running errands
473. vacation,country outside
474. very good
475. VERY NICE

476. Very sensitive to natural soundscapes, cherish the time away from human-caused noises, sitting quietly listening to wind in trees, flowing water, insects buzzing, birds chirping, elk bugling ...
477. Volunteer every other week at a National Historical Park spring to fall.
478. want
479. We are blessed to live in the Allegheny national forest so during good weather we are rarely home and always finding new adventures outdoors.
480. we enjoyed school days
481. We love to go tent camping. and going hiking frequently
482. We moved to a part of town that allows us easy access to hiking and nature walks, unfortunately it is so hot in the summer it is impossible to do it safely. We made plans as a family to spend more time outside this year hiking and biking but I broke my foot putting those plans on hold for a bit longer than planned,
483. We need to give more thought and priority to making outdoor experiences more accessible to older folks. We older folks with aging bodies need rest stops, toilets, etc. more frequently than we did when we were younger.
484. We spend a lot more time outside in the spring and fall vs summer and winter.
485. We spend much more time outside in the spring and summer months.
486. We work at the school our daughter attends, so we actually get to take 1-2 week trips in our travel trailer about 2-3 times per year. We usually go to National or State parks (CA). When we retire, we hope to volunteer in National/State parks.
487. Weather conditions now effect my time outside. It's winter and I live on the Midwestern plains. Fronts race through all winter and my old body refuses to operate correctly during one. Sigh. Thus last weekend was indoors.
488. Weather dependant, I hate snow
489. Weather during the winter often plays a part in the family spending time outside.
490. Weather factors greatly into my time spent outside for work or play
491. Weather permitting and if the area is safe determines whether I get to go outdoors! Sad we just can't go run around like we did as children
492. Well I do work for the NPS, I have worked, taught fire and rode my horses in some of the same Parks.
493. When I lived in a city that was more pedestrian friendly, e.g. sidewalks, and that had better trails, I spent substantially more time

outdoors. Up to 3-4 hours on weekends and at least 1-2 hours during the week.

494. When I retire, I'll be outside much more than I am now.
495. When I was 12, my family drove across the US and went to many National Parks, such as Yosemite and Yellowstone. Seeing the magnificent, pristine lands instilled in me an appreciation of nature that I'm trying to pass on to my children.
496. When living in a place with extreme climates (like Arizona desert in the summer), I find that I do not hardly spend any time outdoors — it's too hot and dangerous. It was a little hard to answer some of the questions because I'm summer, my outdoor time is reduced to almost nothing, while in winter, my level of outdoor activity increases significantly. So when answering, I tried to average the two seasons. Not sure if I should have done that or not.
497. When the weather isn't terribly cold, I like to walk outdoors and bike a local trail for an hour or more every day. But this is Ohio...
498. Whenever I do make time to be outside, I am always glad I did. I hope future generations find ways to incorporate more time spent outdoors, especially within school curriculum's.
499. Wish I did it more.
500. With temperatures below 20 degrees and windy, it is not comfortable to be outdoors this time of year. I do more inside physical activity such as going to the gym.
501. Without access to the outdoors I'd be on antidepressant medication
502. Work hours, urban environment, travel time to more natural outdoor spaces and time doing required personal tasks limit ability to use and enjoy the outdoors.
503. Would do more outdoors but often limited by equipment availability. I also consider time doing yard work/mowing as a choice since I could easily get a service to do it for me.
504. Would love to spend more time outdoors but with two kids and daily responsibilities, it is difficult to find the time.
505. Yard work, working on the property, weeding, planting are all enjoyable. Also, during summer months, we also do crafts outside.
506. yes i would like to spent time in outdoor while cooking with my wife.
507. You are equating "outside" and "in nature", assuming that the latter cannot include walking on a city street, and assuming that adults have no difficulties with transportation.
508. You asked about "screen time" as a child. I had a computer in my room (Commodore 64) and played games on it a lot, but there was no such thing as "screen time" back then.

APPENDIX C

Differences Among Sample Groups: Snowball, Park Service, and MTurk

**Gender \* Group Crosstabulation**

Count

|        |        | Group    |             |       | Total |
|--------|--------|----------|-------------|-------|-------|
|        |        | Snowball | ParkService | MTurk |       |
| Gender | Male   | 46       | 145         | 319   | 510   |
|        | Female | 251      | 456         | 288   | 995   |
|        | Other  | 3        | 5           | 0     | 8     |
| Total  |        | 300      | 606         | 607   | 1513  |

**Race \* Group Crosstabulation**

|       |                                  | Group        |             |       | Total  |
|-------|----------------------------------|--------------|-------------|-------|--------|
|       |                                  | Snowball     | ParkService | MTurk |        |
| Race  | American Indian/Alaska Native    | Count<br>5   | 3           | 42    | 50     |
|       | % of Total                       | 0.3%         | 0.2%        | 2.9%  | 3.4%   |
|       | Asian                            | Count<br>7   | 1           | 56    | 64     |
|       | % of Total                       | 0.5%         | 0.1%        | 3.8%  | 4.4%   |
|       | Black/African American           | Count<br>11  | 7           | 26    | 44     |
|       | % of Total                       | 0.7%         | 0.5%        | 1.8%  | 3.0%   |
|       | Native Hawaiian/Pacific Islander | Count<br>1   | 1           | 2     | 4      |
|       | % of Total                       | 0.1%         | 0.1%        | 0.1%  | 0.3%   |
|       | White/Non-Hispanic               | Count<br>241 | 553         | 445   | 1239   |
|       | % of Total                       | 16.4%        | 37.6%       | 30.3% | 84.2%  |
|       | Other                            | Count<br>22  | 25          | 23    | 70     |
|       | % of Total                       | 1.5%         | 1.7%        | 1.6%  | 4.8%   |
| Total | Count                            | 287          | 590         | 594   | 1471   |
|       | % of Total                       | 19.5%        | 40.1%       | 40.4% | 100.0% |
|       |                                  |              |             |       |        |

**Age \* Group Crosstabulation**

|                   |            | Group    |             |       | Total  |
|-------------------|------------|----------|-------------|-------|--------|
|                   |            | Snowball | ParkService | MTurk |        |
| Age 18-29         | Count      | 61       | 111         | 191   | 363    |
|                   | % of Total | 4.0%     | 7.3%        | 12.6% | 24.0%  |
| 30-39             | Count      | 91       | 142         | 219   | 452    |
|                   | % of Total | 6.0%     | 9.4%        | 14.5% | 29.9%  |
| 40-49             | Count      | 62       | 109         | 102   | 273    |
|                   | % of Total | 4.1%     | 7.2%        | 6.8%  | 18.1%  |
| 50-59             | Count      | 44       | 111         | 60    | 215    |
|                   | % of Total | 2.9%     | 7.3%        | 4.0%  | 14.2%  |
| 60-69             | Count      | 33       | 112         | 31    | 176    |
|                   | % of Total | 2.2%     | 7.4%        | 2.1%  | 11.6%  |
| 70 years or older | Count      | 9        | 20          | 3     | 32     |
|                   | % of Total | 0.6%     | 1.3%        | 0.2%  | 2.1%   |
| Total             | Count      | 300      | 605         | 606   | 1511   |
|                   | % of Total | 19.9%    | 40.0%       | 40.1% | 100.0% |

**Education Level \* Group Crosstabulation**

|                    |  |               | Group        |                 |       | Total      |
|--------------------|--|---------------|--------------|-----------------|-------|------------|
|                    |  |               | Snow<br>ball | ParkSer<br>vice | MTurk |            |
| Education<br>Level | High School<br>Diploma or GED            | Count         | 16           | 13              | 100   | 129        |
|                    |  | % of<br>Total | 1.1%         | 0.9%            | 6.6%  | 8.5%       |
|                    | Associate's<br>Degree or Some<br>College | Count         | 54           | 69              | 164   | 287        |
|                    |  | % of<br>Total | 3.6%         | 4.6%            | 10.8% | 19.0%      |
|                    | College Degree                           | Count         | 110          | 274             | 232   | 616        |
|                    | % of<br>Total                            | 7.3%          | 18.1%        | 15.3%           | 40.7% |            |
|                    | Graduate<br>Certificate or<br>Degree     | Count         | 117          | 242             | 106   | 465        |
|                    |  | % of<br>Total | 7.7%         | 16.0%           | 7.0%  | 30.8%      |
|                    | Other                                    | Count         | 2            | 8               | 5     | 15         |
|                    |  | % of<br>Total | 0.1%         | 0.5%            | 0.3%  | 1.0%       |
| Total              |  | Count         | 299          | 606             | 607   | 1512       |
|                    |  | % of<br>Total | 19.8<br>%    | 40.1%           | 40.1% | 100.0<br>% |

**Current marital status \* Group Crosstabulation**

|                        |         |                     | Group        |              |              | Total          |
|------------------------|---------|---------------------|--------------|--------------|--------------|----------------|
|                        |         |                     | Snowball     | ParkService  | MTurk        |                |
| Current marital status | Single  | Count<br>% of Total | 121<br>8.0%  | 272<br>18.0% | 335<br>22.2% | 728<br>48.2%   |
|                        | Married | Count<br>% of Total | 171<br>11.3% | 317<br>21.0% | 267<br>17.7% | 755<br>50.0%   |
|                        | Widowed | Count<br>% of Total | 7<br>0.5%    | 16<br>1.1%   | 5<br>0.3%    | 28<br>1.9%     |
| Total                  |         | Count<br>% of Total | 299<br>19.8% | 605<br>40.0% | 607<br>40.2% | 1511<br>100.0% |

**Raising any children under the age of 18 in your home \* Group Crosstabulation**

|   |     |                     | Group        |              |              | Total          |
|---|-----|---------------------|--------------|--------------|--------------|----------------|
|   |     |                     | Snowball     | ParkService  | MTurk        |                |
| Raising any children under the age of 18 in your home | No  | Count<br>% of Total | 183<br>12.1% | 469<br>31.0% | 376<br>24.8% | 1028<br>67.9%  |
|   | Yes | Count<br>% of Total | 117<br>7.7%  | 137<br>9.0%  | 232<br>15.3% | 486<br>32.1%   |
| Total   |     | Count<br>% of Total | 300<br>19.8% | 606<br>40.0% | 608<br>40.2% | 1514<br>100.0% |

**What kind of environment was your hometown when you were growing up? \* Group Crosstabulation**

|  |            |            | Group    |            |        | Total |
|--|------------|------------|----------|------------|--------|-------|
|  |            |            | Snowball | ParkSevice | MTurk  |       |
| What kind of environment was your hometown when you were growing up? | Rural      | Count      | 124      | 232        | 134    | 490   |
|  |            | % of Total | 8.2%     | 15.4%      | 8.9%   | 32.5% |
|  | Suburban   | Count      | 142      | 318        | 282    | 742   |
|  |            | % of Total | 9.4%     | 21.1%      | 18.7%  | 49.1% |
|  | Urban      | Count      | 33       | 53         | 192    | 278   |
|  |            | % of Total | 2.2%     | 3.5%       | 12.7%  | 18.4% |
| Total  | Count      | 299        | 603      | 608        | 1510   |       |
|  | % of Total | 19.8%      | 39.9%    | 40.3%      | 100.0% |       |
|  |            |            |          |            |        |       |

**Current estimated screen time, during work week \* Group  
Crosstabulation**

|   |                                   |                        | Group        |              |              | Total          |
|---|-----------------------------------|------------------------|--------------|--------------|--------------|----------------|
|   |                                   |                        | Snow ball    | ParkSe rvice | MTur k       |                |
| Current estimated screen time, during work week | None (0 hr per day)               | Count<br>% of<br>Total | 1<br>0.1%    | 2<br>0.1%    | 12<br>0.8%   | 15<br>1.0%     |
|   | Less than 0.5 hr per day          | Count<br>% of<br>Total | 3<br>0.2%    | 3<br>0.2%    | 17<br>1.1%   | 23<br>1.5%     |
|   | Between 0.5 hr and 1 hour per day | Count<br>% of<br>Total | 13<br>0.9%   | 24<br>1.6%   | 48<br>3.2%   | 85<br>5.6%     |
|   | 1 - 2 hours per day               | Count<br>% of<br>Total | 52<br>3.5%   | 119<br>7.9%  | 104<br>6.9%  | 275<br>18.3%   |
|   | 2 - 3 hours per day               | Count<br>% of<br>Total | 80<br>5.3%   | 126<br>8.4%  | 113<br>7.5%  | 319<br>21.2%   |
|   | 3 - 4 hours per day               | Count<br>% of<br>Total | 51<br>3.4%   | 123<br>8.2%  | 78<br>5.2%   | 252<br>16.7%   |
|   | 4 - 5 hours per day               | Count<br>% of<br>Total | 35<br>2.3%   | 73<br>4.9%   | 53<br>3.5%   | 161<br>10.7%   |
|   | 5 or more hours per day           | Count<br>% of<br>Total | 62<br>4.1%   | 134<br>8.9%  | 179<br>11.9% | 375<br>24.9%   |
|   | <b>Total</b>                      | Count<br>% of<br>Total | 297<br>19.7% | 604<br>40.1% | 604<br>40.1% | 1505<br>100.0% |

**Current estimated screen time, weekends \* Group Crosstabulation**

|   |                                   |                        | Group        |              |                | Total        |
|---|-----------------------------------|------------------------|--------------|--------------|----------------|--------------|
|   |                                   |                        | Snow ball    | ParkService  | MTurk          |              |
| Current estimated screen time, weekends | None (0 hr per day)               | Count<br>% of<br>Total | 1<br>0.1%    | 2<br>0.1%    | 11<br>0.7%     | 14<br>0.9%   |
|   | Less than 0.5 hr per day          | Count<br>% of<br>Total | 1<br>0.1%    | 4<br>0.3%    | 18<br>1.2%     | 23<br>1.5%   |
|   | Between 0.5 hr and 1 hour per day | Count<br>% of<br>Total | 9<br>0.6%    | 23<br>1.5%   | 33<br>2.2%     | 65<br>4.3%   |
|   | 1 - 2 hours per day               | Count<br>% of<br>Total | 58<br>3.8%   | 102<br>6.8%  | 89<br>5.9%     | 249<br>16.5% |
|   | 2 - 3 hours per day               | Count<br>% of<br>Total | 71<br>4.7%   | 157<br>10.4% | 105<br>7.0%    | 333<br>22.1% |
|   | 3 - 4 hours per day               | Count<br>% of<br>Total | 77<br>5.1%   | 141<br>9.4%  | 99<br>6.6%     | 317<br>21.0% |
|   | 4 - 5 hours per day               | Count<br>% of<br>Total | 37<br>2.5%   | 78<br>5.2%   | 74<br>4.9%     | 189<br>12.5% |
|   | 5 or more hours per day           | Count<br>% of<br>Total | 44<br>2.9%   | 96<br>6.4%   | 178<br>11.8%   | 318<br>21.1% |
| <b>Total</b>                            | Count<br>% of<br>Total            | 298<br>19.8%           | 603<br>40.0% | 607<br>40.3% | 1508<br>100.0% |              |

## VITA

After completing an Associate of Arts Degree at Mohave Community College and a Bachelor of Arts Degree in Environmental Studies at Prescott College in Prescott, Arizona, Elizabeth Skinner became employed with the National Park Service as a park ranger. She earned an undergraduate certificate in Parks and Recreation Management from Northern Arizona University in 2013. In 2014, she entered Stephen F. Austin State University as a non-degree seeking student to study Science and the Public Interface. In 2016, she enrolled as a graduate student to pursue a degree in Resource Communication, and received the degree of Master of Science in Resource Communication in December of 2019.

Permanent Address: 3772 Jefferson St,  
Carlsbad, CA 92008

APA Sixth Edition Citation Style

This thesis was typed by Elizabeth Skinner