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The Relationship Between Nature, Media Use and Psychosocial Well Being in a College

Population

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Honors thesis

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### **Abstract**

**Objective:** Time in nature is associated with a variety of mental, physical and emotional health benefits while the effects of media use on psychosocial well being are unclear. Although our society is increasingly urbanized and technology-focused, there is a lack of research examining the relationship between nature, media and psychosocial well-being. The aim of this research was to explore these variables in a college-age population. **Method:** 82 participants participated in a survey using measures of Psychosocial Well Being, Media Use and Nature Connection and Exposure. **Results:** Media use partially mediates the relationship between nature relatedness and social anxiety. **Conclusions:** There is a need for future study of these variables in a variety of age-groups and with increased focus on demographics and location.

*Keywords:* nature, media, psychosocial well being, college students

## **Associations between Nature, Media Use and Psychosocial Well Being in a College Population**

### **Introduction**

#### *1.1 Benefits of nature exposure for humans*

Exposure to nature is related to a variety of physical, mental and emotional health benefits for humans. Nature can be understood as an area with elements of living systems such as plants and non-human animals, and natural areas range from an urban park to remote wilderness (Bratman et al., 2012). Individuals living in areas with increased amounts of nature have greater mental, physical and social health than their counterparts, and exposure to natural environments is associated with better general and perceived health, reduced mortality rates and increased healing from trauma (Cox et al., 2017). The psychosocial benefits of exposure to nature are plentiful; time in nature is associated with a reduction in chronic mental illness, improved well-being and self esteem, decreased depression levels, more positive mood, greater vitality, and increased social interaction and social empowerment (Cox et al., 2017; Swami et al., 2018). Some environments, particularly those dominated by green vegetation, are deemed “restorative environments” and allow a shift towards more positive emotional states, increased physical activity and improved behavior and cognitive functioning. Natural settings generate diminished arousal compared to complex, intense and variable urban environments, and when in nature, humans experience cognitive restoration and protection against the effects of stressful environments. As a result, nature is thought to have direct positive effects on psychosocial well being and also provide a buffer against negative emotions and stress (Berto, 2014).

#### *1.2 Psychophysiological Stress Recovery Theory for benefits of nature exposure*

The first primary explanatory framework for the benefits of time in nature on mental health is the Psychophysiological Stress Recovery Theory. The Psychophysiological Stress Recovery Theory (PSRT) suggests that humans have an unconscious positive response to nature based on our evolutionary past, as certain natural places, particularly those near water and with a visible horizon, were optimal for human survival. According to the theory, humans have an automatic physiological and psychological reduction in stress when exposed to nature, and studies have supported this theory, with mildly stressed participants shown nature scenes reporting increased positive affect, and individuals shown urban scenes reporting increased aggravation, anxiety and sadness. Physiological measures of stress have also supported PSRT, with stressed individuals transported to forest settings showing a significant decrease in salivary cortisol concentration, diastolic blood pressure and pulse rate when compared to counterparts taken to an urban setting (Bratman et al., 2012).

### *1.3 Attention Restoration Theory for benefits of nature exposure*

The second primary framework for why nature benefits human mental health is the Attention Restoration Theory (ART), which suggests that nature replenishes certain types of human attention because of unconscious cognitive processes that occur when individuals are exposed to natural landscapes. According to ART, urban life taxes human capability for focus and concentration more than situations in our evolutionary past, so time in nature allows humans to restore our cognitive capacity. The theory suggests that tasks that require working memory and impulse inhibition fatigue our capability for cognitive control, whereas certain stimuli in the natural environment are “inherently intriguing” and do not require concentration (Bratman et al., 2012, p.124). According to ART, if an environment is beautiful or intriguing, an individual’s

directed attention system is allowed to rest, pessimistic thoughts are reduced and negative emotions are superseded by fascination and positive emotions (Berto, 2014). Various components of a landscape determine its replenishing capacity, including the extent of time an individual spends in the environment, if the environment allows for an “escape” from daily life, how fascinating and innately interesting the environment is, and the compatibility between the individual and the environment. The Attention Restoration Theory has been supported by a variety of work, with studies finding that individuals exposed to pictures of natural scenery perform better on attention tasks, delay of gratification tests, and concentration tests compared counterparts who viewed pictures of urban scenery (Bratman et al., 2012).

#### *1.4 Nature Relatedness*

In addition to immediate contact with nature, feelings of nature relatedness can promote human physical and mental health. Nature relatedness is described as the “cognitive, affective and physical connections that individuals have with the natural world” and our relationship with nature is suggested to generate an “ecological identity” within us (Nisbet et al., 2009 in Windhorst & Williams, 2016, p. 235). Individuals who experience greater nature relatedness tend to experience greater positive affect, vitality and life satisfaction than counterparts that feel less relatedness, and exposure to nature generates short and long term increases in connection to nature, creating a two-fold benefit (Windhorst & Williams, 2016).

#### *1.5 Urbanization and nature exposure*

It is particularly important to understand the benefits of time in nature to psychosocial well-being due to the increasingly urbanized nature of the modern world. Over half the global population lives in urban areas, a projected 66% of the world will live in cities by 2050 and

individuals in urban areas are at greater risk for anxiety, depression, psychosis and addictive disorders. There is a causal relationship between urban living and mental health issues, and because city-dwellers no longer experience the restorative effects and benefits of nature, this population may experience a double risk to psychosocial well being (Bakolis et al., 2018).

### *1.6 Media use in modern world*

In addition to the effect of urbanization on human interaction with nature, a global increase in digital technology use has reshaped human exposure to natural environments and created its own implications for physical, social and emotional well being. 82% of individuals in the United States between 18 and 49 use social media and 90% of Americans use the internet, with the exception mostly being older citizens (Anderson et al., 2019.; *Use of internet, social media, digital devices plateaus in US* | Pew Research Center, n.d.). The relationship between media use and psychosocial well being is particularly important for young adults, a demographic that is the first to have “grown up” with social networking, creating unprecedented effects on brain development and social interaction (Best et al., 2014). Media use among adolescents is high; 95% of teens have access to a smartphone, 70% of adolescents use social networks at least once a week and 45% say they are online “almost constantly”. Going forward, it is hypothesized that young people will need increased support and coping mechanisms to navigate a more technologically complex world (Anderson & Jiang, 2018; Quandt, 2019; Best et al., 2014).

### *1.7 Beneficial effects of media on psychosocial well being*

The overall effects of media use on psychosocial well being remain nebulous. Some studies suggest that use of the Internet decreases loneliness and depression while increasing perceived social support and self-esteem, and one study found a positive relationship between

number of social networking friends online and perceived social support, sense of community and overall life satisfaction (Shaw & Gant, 2002; Oh et al., 2014). Some literature also suggests that increased social networking opportunities raise self-esteem and feelings of belonging, with self-disclosing generating feelings of support and community integration (Ko & Kuo, 2009)

### *1.8 Negative effects of media on psychosocial well being*

At the same time, research suggests that when individuals engage in communication using social media or the internet, they experience less honest friendships and romantic relationships, and communication through online relationships is less valuable for building and sustaining close relationships (*Project MUSE - When Your Smartphone Is Too Smart for Your Own Good: How Social Media Alters Human Relationships*, n.d.). Preference for using media for interpersonal communication is associated with greater peer aggression, relationship anxiety and existential anxiety, and lonely and depressed individuals are more likely to experience compulsive Internet use which can create problems at school, home and work (Cyr et al., 2015; Caplan, 2016). Researchers have also found that high social media use predicts higher depressive symptoms, anxiety, panic disorder symptoms, diminished life satisfaction, delinquent behavior and family conflict, and frequent Facebook use is associated with increased psychological distress (Vannucci & McCauley Ohannessian, 2019). Overall, one meta-analysis of the literature suggests mixed effects of social media on adolescent well-being, with social media benefiting individuals by generating increased self-esteem, opportunities for self-disclosure and safe identity experimentation, but increasing exposure to harm, social isolation, depression and cyber-bullying (Best et al., 2014).

### *1.9 Justification for study*



Despite research suggesting significant effects of time in nature and media use on psychosocial well-being, there is little work exploring their interaction in informing human health in an increasingly urbanized and technological world. Exploring these variables is particularly important to understand the well being of adolescents, a population with high media use facing novel challenges at a vulnerable age. As a result, we sought to address a gap in the literature by exploring the effects of time in nature and media use on psychosocial well-being in college students. In particular, we aimed to explore the association between time in nature, nature relatedness and psychosocial well-being, how media use affects psychosocial well being, and if nature relatedness moderates the relationship between media use and psychosocial well being in college students.

## **Methods**

### *Participants*

Our full sample consisted of 82 undergraduate students between 18 and 22 years old. Participants attended the University of Richmond, a liberal arts university that is 48% male and 52% female, 58% white, 7% Black or African-American, 9% Hispanic or Latino, 8% Asian, 5% two or more races and 4% race and ethnicity unknown (*Student Diversity—Facts & Rankings—University of Richmond*, n.d.). Participants were oversampled from an introductory Psychology class. All participants were recruited via a posting on SONA, a website for Psychology 100 students to receive class credit, or via flyer advertisements and group text messages. This study was approved by the University of Richmond institutional review board and informed consent was obtained from all participants prior to the experiment.

### *Measures*

Measures for this study included self report of psychosocial well being (Satisfaction with Life Scale, Self-Esteem Scale, Center for Epidemiological Studies - Depression Scale, Social Anxiety Scale for Adolescents), connection to nature (Exposure to Nature Scale, Nature Relatedness Scale) and media use (Social Media Engagement Questionnaire).

*Psychosocial well being.*

Participant well-being was measured via the Satisfaction with Life Scale, a measure with five items and a Likert scale from one (strongly disagree) to seven (strongly agree) to indicate agreement with statements like “In most ways my life is close to my ideal” and “If I could live my life over, I would change almost nothing” (Diener et al., 1985). Chronbach’s alpha for the Satisfaction with Life Scale was  $\alpha=.92$ .

Participant self-esteem was measured using the Self-Esteem scale, a measure with ten items and a Likert scale from one (strongly disagree) to five (strongly agree) for participants to rate agreement with statements like “On the whole, I am satisfied with myself” and “I wish I could have more respect for myself” (Rosenberg, 1965). Chronbach’s alpha for the Self-Esteem scale was  $\alpha=.82$ .

Participant depressive symptoms were measured using the Center for Epidemiological Studies - Depression Scale, a measure with 20 items and a Likert scale from one (rarely or none of the time) to four (most or all of the time) for participants to indicate how often they felt or behaved in the last two weeks in accordance with statements like “I felt that everything I did was an effort” or “I had crying spells” (Radcliff, 1977).

Participant social anxiety was measured using the Social Anxiety Scale for Adolescents, a measure with 18 items and a Likert scale from one (not at all) to five (all of the time) to rate

agreement with statements like “I worry about what others say about me” and “I get nervous when I meet new people” (La Greca & Lopez, 1998). Chronbach’s alpha for the Social Anxiety Scale for Adolescents was  $\alpha=.76$ .

#### *Nature exposure and relatedness.*

Participant exposure and connection to nature was measured using the Exposure to Nature scale, an eight item measure with a Likert scale from one (never) to five (a lot) for participants to rate frequency for questions like “In the last month, how often did you spend time at a park, farm, garden or urban green space?” and to respond to questions like “How important is it to you to spend time in nature?” (Repke, Berry, Conway, Metcalf, Hansen & Phelan, 2018). Chronbach’s alpha for Nature Exposure was  $\alpha=.78$ . Participant relationship with nature was measured using the Nature Relatedness scale, a 21 item scale with a Likert scale from one (disagree strongly) to five (agree strongly) for participants to rate agreement with statements like “Some species are just meant to die out and become extinct” and “I am not separate from nature, but a part of nature” (Nisbet, Zelensky & Murphy, 2009). The Nature Relatedness Scale has three subscales; nature-relatedness and self, which includes self-identification with nature, nature-relatedness and perspective, which includes pro-nature conservation attitudes, and nature-relatedness and experience which includes contact with nature (Nisbet & Zelenski, 2013).

#### *Social Media Use*

Social media use was measured using the Social Media Engagement Questionnaire, a measure with five items and a Likert scale from zero (not in one day) to seven (everyday) for participants to respond to five items like “How often did you use social media in the 15 minutes before you go to sleep?” and “How often did you use social media when eating breakfast?”

(Przybylski, Murayama, DeHann, & Gladwell, 2013). Chronbach's alpha for the Social Media Engagement Questionnaire was  $\alpha=.89$ .

### *Procedure*

This study was conducted in a university setting. We advertised the study using SONA, a cloud-based research participation platform, flyers and in group text messages, and participants were instructed to complete the study at their convenience in a quiet, private setting. Data collection occurred for 8 weeks, after which we analyzed results using SPSS Statistics software.

## **Results**

### *Descriptive Statistics*

We conducted preliminary descriptive analyses and bivariate correlations between variables using SPSS Statistics Version 25. Descriptive statistics appear in Table 1 in Appendix. Overall, the sample exhibited moderate levels of nature relatedness and self ( $M=3.516$ ,  $SD=0.78$ ), nature relatedness and experience ( $M=3.321$ ,  $SD=0.837$ ), exposure to nature ( $M=2.551$ ,  $SD=0.57$ ), social media engagement ( $M=4.8805$ ,  $SD=1.994$ ) and social anxiety ( $M=2.737$ ,  $SD=0.651$ ). There was no significant correlation between exposure to nature and participant psychosocial well being, but there was a weak to moderate association between nature-relatedness and self and anxiety ( $r=-.195$ ,  $p < .05$ ), nature-relatedness and experience and anxiety ( $r=-.254$ ,  $p < .05$ ) and nature-relatedness and self and self-esteem ( $r=.190$ ,  $p < .05$ ). Higher media use was moderately associated with lower self-esteem ( $r=-.31$ ,  $p < .05$ ), higher depression ( $r=.27$ ,  $p < .05$ ), higher anxiety ( $r=.24$ ,  $p < .05$ ), and lower life satisfaction ( $r=-.36$ ,  $p < .05$ ). Higher media use was associated with decreased exposure to nature ( $r=-.193$ ,  $p < .05$ ) and diminished nature relatedness experience ( $r=-.254$ ,  $p < .05$ ). Exposure to nature was moderately

correlated with nature-relatedness and self ( $r=.448, p < .05$ ) and nature-relatedness and experience ( $r=.649; p < .05$ ) whereas exposure to nature was associated with decreased media use ( $t=-.19; p < .05$ ). Nature relatedness and experience was also associated with lower levels of media use ( $r=-.254, p < .05$ ) and nature relatedness and self had a near significant association with lower levels of media use ( $r=-.134, p = .115$ ).

### *Regression Analysis*

To evaluate whether media is a mediator of the relation between nature relatedness and social anxiety, I conducted a series of four regressions in which I tested the a path (i.e., the path from the independent variable, nature relatedness, to the mediator, media), b, c and c' paths involved. The relationship between nature-relatedness/experience and social anxiety was measured with media use as a mediator. See Figure 1 in Appendix.

As Figure 1 illustrates, I investigated the c path, or the total effect, and found that high levels of nature-relatedness and experience had a significant effect on lower levels of social anxiety ( $t=-2.353, \beta =-.254, p < .05$ ). In exploring the a and b paths, I found that the a path (i.e., the relationship between nature-relatedness/experience and media use) was nearing significance ( $t=-2.353, \beta =-.254, p=.02$ ) and the relationship between social anxiety and media use was significant ( $t=2.216, \beta =.239, p<.05$ ). As a result, according to the product of coefficients method for establishing mediation, there was sufficient evidence for mediation (MacKinnon, 2008). To provide further evidence for mediation, I examined the direct effect (c' path), or path from nature-relatedness to social anxiety when controlling for media use. In doing so, I found that when controlling for the mediator, the relationship between nature-relatedness/experience and social anxiety was no longer nearing significance ( $t=-1.873, \beta = -.207, p=0.65$ ), suggesting

that media use partially explains the relationship between nature-relatedness/experience and social anxiety levels.

### **Discussion**

Our findings suggest that within a college-age population, exposure to nature alone does not significantly affect psychosocial well being, but there is a moderate relationship between increased nature-relatedness, reduced anxiety and depression and increased self-esteem. Our sample exhibited moderate to low levels of nature exposure and nature-relatedness overall, and a relatively weak correlation between exposure to nature and psychosocial well being could be explained by a variety of factors. Self-selection into the University of Richmond may have altered the sample and affected results; 61% of students at the University of Richmond are from New England, the Mid-Atlantic and the South, with fewer students hailing from areas like the Pacific Coast and Rocky Mountains where individuals spend more time viewing nature, engaging in backcountry activities and doing outdoor winter sports (*Student Profile—Undergraduate Admission—University of Richmond*, n.d.; Cordell, n.d.) Our student population might have also represented individuals with particular majors and fields of study that are less inclined to spend time outdoors or feel connected to nature. In addition, data was collected in late winter, a time when participants might spend less time outdoors, potentially altering exposure and relatedness to nature. Finally, *how* individuals spent their time in nature might affect findings; for example, if individuals spend time in nature but are simultaneously on their social media or electronic devices, this might alter the relationship between nature exposure and nature relatedness or diminish a protective effect of nature relatedness on psychosocial well-being. These variables may explain the relatively weak correlation we found between nature

exposure and relatedness and psychosocial well being, a phenomenon that differs from robust findings on the relationship between time in nature, nature relatedness and health benefits for humans, suggesting the need to further investigate this relationship in various demographics and settings (Bratman et al., 2012; Cox et al., 2017; Swami et al., 2018)

Our results show a significant relationship between media use and psychosocial well-being, with higher media use associated with increased anxiety and depression and lower self-esteem and life satisfaction. These results align with existing findings on the correlation between social media use and depression, anxiety and diminished life satisfaction, but differ from existing research on the role of social media in increasing self-esteem (Best et al., 2014; Vannucci & McCauley Ohannessian, 2019) Our sample exhibited moderate to high media use overall, and higher media use was associated with diminished nature exposure and relatedness, potentially explaining lower scores on nature measures.

Our mediation analysis suggested that media use partially explains the relationship between nature relatedness and social anxiety, with increased media use diminishing the relationship between increased nature relatedness and decreased social anxiety. This suggests that any protective effect nature relatedness might have against social anxiety is diminished by media use, but because the mediation is weak, there are likely other variables at play.

This work provides a valuable foundation for future study of the relationship between nature, media use and psychosocial well being, particularly in a college-age population. Going forward, a larger sample size may generate stronger correlation findings, and extending research to universities in various geographic and cultural contexts of the United States will allow increased understanding of factors that inform the relationship between variables. In addition,

future research may examine how gender, race, ethnicity and other demographics alter participant exposure and relation to nature, media use and psychosocial well being. It would also be valuable to expand on this work using a variety of age groups and explore differences in the relationship between nature, media and psychosocial well-being between a variety of age groups. Finally, further exploring how variables expressly interact, such as how media use during time in nature affects psychosocial well-being, will allow a clearer understanding of the exact relationship between variables. In turn, this will generate a more informed approach to supporting the psychosocial well-being of individuals in the 21st century, an urbanized and technology-centric world, and working towards the health and well-being of all.



## References

- Anderson, M. and Jiang, J. “Teens, Social Media & Technology 2018.” *Pew Research Center: Internet, Science & Tech* (blog), May 31, 2018.  
<https://www.pewresearch.org/internet/2018/05/31/teens-social-media-technology-2018/>
- Anderson, M., Anderson P., Jingjing J., and Kumar, M. “10% of Americans Don’t Use the Internet. Who Are They?” *Pew Research Center* (blog). Accessed April 19, 2020.  
<https://www.pewresearch.org/fact-tank/2019/04/22/some-americans-dont-use-the-internet-who-are-they/>.
- Bakolis, I., Hammoud, R., Smythe, M., Gibbons, J., Davidson, N., Tognin, S. and Mechelli, A. “Urban Mind: Using Smartphone Technologies to Investigate the Impact of Nature on Mental Well-Being in Real Time.” *BioScience* 68, no. 2 (February 1, 2018): 134–45.  
<https://doi.org/10.1093/biosci/bix149>.
- Best, P., Manktelow, R., and Taylor, B. “Online Communication, Social Media and Adolescent Wellbeing: A Systematic Narrative Review.” *Children and Youth Services Review* 41 (June 1, 2014): 27–36. <https://doi.org/10.1016/j.childyouth.2014.03.001>.
- Bratman, G.N., Hamilton, P.J., and Daily, G.C. “The Impacts of Nature Experience on Human Cognitive Function and Mental Health.” *Annals of the New York Academy of Sciences* 1249, no. 1 (February 10, 2012): 118–36.  
<https://doi.org/10.1111/j.1749-6632.2011.06400.x>.
- Caplan, S.E. “Preference for Online Social Interaction: A Theory of Problematic Internet Use and Psychosocial Well-Being, 2003.” *Communication Research*, June 29, 2016.  
<https://journals-sagepub-com.newman.richmond.edu/doi/10.1177/0093650203257842>.
- Cordell, K.H. “Outdoor Recreation in the Northern United States,” n.d., 84.
- Cox, D., Shanahan, D., F., Hudson, H., Fuller, R., Anderson, K., Hancock, S., and Gaston, K. “Doses of Nearby Nature Simultaneously Associated with Multiple Health Benefits.” *International Journal of Environmental Research and Public Health* 14, no. 2 (February 2017) 1–24. <https://doi.org/10.3390/ijerph14020172>.
- Cyr, B, Berman, S., and Smith, M. “The Role of Communication Technology in Adolescent Relationships and Identity Development.” *Child & Youth Care Forum* 44, no. 1 (February 1, 2015): 79–92. <https://doi.org/10.1007/s10566-014-9271-0>.

- Ko, H, and Kuo, F. "Can Blogging Enhance Subjective Well-Being through Self-Disclosure?" *Cyberpsychology & Behavior: The Impact of the Internet, Multimedia and Virtual Reality on Behavior and Society* 12, no. 1 (February 2009): 75–79. <https://doi.org/10.1089/cpb.2008.016>.
- Nisbet, E., and Zelenski, J. "The NR-6: A New Brief Measure of Nature Relatedness." *Frontiers in Psychology* 4 (2013): 1–11. <https://doi.org/10.3389/fpsyg.2013.00813>.
- Oh, H, Ozkaya, E, and LaRose, R. "How Does Online Social Networking Enhance Life Satisfaction? The Relationships among Online Supportive Interaction, Affect, Perceived Social Support, Sense of Community, and Life Satisfaction." *Computers in Human Behavior* 30 (January 2014): 69–78. <https://doi.org/10.1016/j.chb.2013.07.053>.
- "Project MUSE - When Your Smartphone Is Too Smart for Your Own Good: How Social Media Alters Human Relationships." Accessed April 8, 2020. <https://muse.jhu.edu/article/586632/pdf>.
- Quandt, F., Tang, W., Quandt, T. "Psychosocial Well-Being and Social Media Engagement: The Mediating Roles of Social Comparison Orientation and Fear of Missing out." *New Media & Society*, January 20, 2019. <https://journals-sagepub-com.newman.richmond.edu/doi/10.1177/1461444818823719>.
- Shaw, L., and Gant, L. "In Defense of the Internet: The Relationship between Internet Communication and Depression, Loneliness, Self-Esteem, and Perceived Social Support." *CyberPsychology & Behavior* 5, no. 2 (April 2002): 157–71. <https://doi.org/10.1089/109493102753770552>.
- "Student Diversity - Facts & Rankings - University of Richmond." Accessed April 10, 2020. <https://www.richmond.edu/about/consumer-info/diversity.html>.
- "Student Profile - Undergraduate Admission - University of Richmond." Accessed April 17, 2020. <https://admissions.richmond.edu/studentprofile/index.html>.
- Swami, V., Barron, D and Furnham, A. "Exposure to Natural Environments, and Photographs of Natural Environments, Promotes More Positive Body Image." *Body Image* 24 (March 1, 2018): 82–94. <https://doi.org/10.1016/j.bodyim.2017.12.006>.
- "Use of Internet, Social Media, Digital Devices Plateaus in US | Pew Research Center." Accessed April 10, 2020. <https://www.pewresearch.org/fact-tank/2018/09/28/internet-social-media-use-and-device-ownership-in-u-s-have-plateaued-after-years-of-growth/>.

Vannucci, A, and Ohannessian, C.M. “Social Media Use Subgroups Differentially Predict Psychosocial Well-Being During Early Adolescence.” *Journal of Youth and Adolescence* 48, no. 8 (August 1, 2019): 1469–93.

<https://doi.org/10.1007/s10964-019-01060-9>.

Windhorst, E, and Williams, A. “Bleeding at the Roots: Post-Secondary Student Mental Health and Nature Affiliation.” *The Canadian Geographer / Le Géographe Canadien* 60, no. 2 (2016): 232–38. <https://doi.org/10.1111/cag.12273>.

Appendix

Table 1.

| Variable          | 1     | 2     | 3     | 4     | 5     | 6     | 7    | 8  | M (SD)      |
|-------------------|-------|-------|-------|-------|-------|-------|------|----|-------------|
| Nature Exposure   | --    |       |       |       |       |       |      |    | 2.55 (0.57) |
| NR-Self           | .448  | --    |       |       |       |       |      |    | 3.51 (0.78) |
| NR-Experience     | .649  | .645  | --    |       |       |       |      |    | 3.32 (0.83) |
| Media Use         | -.193 | -.134 | -.254 | --    |       |       |      |    | 4.88 (1.99) |
| Anxiety           | -.195 | .195  | -.254 | .239  | --    |       |      |    | 2.73 (0.65) |
| Depression        | .049  | -.002 | -.050 | .266  | .510  | --    |      |    | 1.93 (0.57) |
| Life Satisfaction | .161  | .102  | .178  | -.361 | -.349 | -.488 | --   |    | 5.03 (1.26) |
| Self-esteem       | .126  | .190  | .166  | -.308 | -.584 | -.655 | .646 | -- | 3.51 (0.78) |

Figure 1.

