Nature and Wellness: Survey Regarding the Relationship Between Exposure to Nature and Physical Health, Life Satisfaction, and Biophilia

College of Western Idaho

December 4, 2022

Abstract

Many consider nature to be influential when it comes to mental and physical health (Martin et al., 2020). To examine the relationship between nature and wellbeing, we created a survey through Google Forms. We hypothesized that nature exposure is related to biophilia, physical health, and life satisfaction. The study's participants included students 18 years old and older from the College of Western Idaho. The students enrolled in multiple psychology courses took the survey for course credit. We received 98 legitimate responses and cleaned the data to ensure its validity. Several Pearson correlation analyses were conducted to test the hypotheses. No significant relationships were found between time spent in nature and frequency of illness, life satisfaction, or biophilia. There were sociocultural factors such as gender that were not considered when creating the survey, which may have affected how participants answered the questions. The skewness of time spent in nature was 2.07, indicating that the distribution was right-skewed and not normal. Future research should consider implementing more accurate ways to measure participants' time spent in nature and recruit a sample more representative of the larger population.

Keywords: nature, psychological wellbeing, health, life satisfaction, biophilia

Nature and Wellness: Survey Regarding the Relationship Between Exposure to Nature and Physical Health, Life Satisfaction, and Biophilia

Nature as a category is extremely broad; most research defines nature as greenspace, which are areas of land that contain grass and other typically green flora (Houlden et al., 2018). The benefits of exposure to natural environments are promoting mental and physical healing, which is why hospitals provide access to outdoor greenspace (Repke et al., 2018). The feeling of awe which is experienced from exposure to nature has been related to higher levels of mental wellbeing and life satisfaction; both extraordinary exposure to nature (such as a rafting trip) and ordinary exposure to nature (such as taking a walk) have positive effects on mood and life satisfaction (Anderson et al., 2018).

Bratman et al. (2012) defined biophilia as the personal significance or perceived connectedness of nature to an individual. It is through biophilia that a person may experience positive emotions such as awe and happiness from exposure to nature, though perceived connectedness to nature varies between individuals (Bratman et al., 2012; Martin et al., 2020). In one survey, 90% of participants claimed that views of natural landscapes and greenery were important or essential for their living spaces (Frumkin, 2001).

We conducted a survey to determine how direct and indirect exposure to nature relates to psychological and physical wellbeing, life satisfaction, and cognition. To collect data for this study, a survey that focused on direct and indirect exposure to nature, frequency of exposure, mental and physical health, life satisfaction, and biophilia was distributed to students attending psychology courses at the College of Western Idaho (CWI). We hypothesized the following:

H1: Time spent in nature is related to how often someone experiences illness.

H2: Time spent in nature is related to life satisfaction.

H3: Time spent in nature is related to biophilia.

Method

Participants

All participants were students attending CWI in the spring semester of 2022. These students were enrolled in an introductory psychology course. Out of 98 participants, 44 were aged 18-21, while the rest ranged from 22-57 years old. The majority of the participants lived in urban areas; 32 lived in rural areas and one chose not to answer.

Measures

The survey contained 31 questions regarding the participants' frequency of exposure to nature, method of exposure, mental and physical health, life satisfaction, and biophilia. Twenty-two of the questions used Likert scales to more accurately reflect each participant's mood levels and relationship to nature. Five questions were multiple choice, and one was a semantic difference scale. We included three open response questions to record specific information such as age and average time spent doing activities. Refer to Appendix A for a full list of survey questions.

Procedure

The survey was conducted online through Google Forms. To ensure participants' privacy, no names or personal identifiers were collected. The survey will always be password protected. Instructors encouraged participation in the study by giving students course credit. An alternate assignment was provided to students who did not wish to take the survey. A consent form was attached at the beginning of the survey and participants gave their consent by clicking "Next" to continue. When clicking "Next" the participants also agreed they were 18 years old or older.

The survey remained open for 21 days. During the time the survey was open, only Professor McCurdy had access to the data. After the survey closed and was no longer accepting responses, Professor McCurdy shared the raw data with us through a password-protected CWI server.

We received a total of 98 legitimate responses. We originally received 99, but we had to remove one participant's data because the participant answered "17" on question 1 (What is your age?). We only accepted responses from students 18 years old or older. For question 15 (On average, how many minutes or hours per week do you spend in nature when the weather permits?), three answers were removed from the data for providing a time range instead of an estimated average. We converted participants' answers into hours rounded to the nearest hundredth. For question 16 (How many minutes does it take you to access a greenspace you go to at least once a month?) two answers were removed from the data because the participants responded with a time range instead of an estimated average. We converted all answers into minutes, rounded to the nearest hundredth. We removed irrelevant information from the data when three participants elaborated the reason for their answers.

The data will be stored in a password-protected database for 5 years, after which the data will be destroyed.

Results

The average amount of time spent in nature was a variable in each hypothesis. Data were collected from 93 participants, while several chose not to answer. On average, participants reported spending 8.43 hours per week ($SD = 9.74$) in nature.

The first hypothesis was that time spent in nature would be related to how often someone experienced physical illness. On average, participants scored a 1.15 ($SD = 1.04$; $n = 93$) on the

illness frequency scale. Illness ratings ranged from 1 (*never ill*) to 4 (*always ill*). To test this hypothesis, a Pearson correlation analysis was conducted. The results were not significant, $r(91) = .05$, $p = .628$.

The second hypothesis was that time spent in nature would be related to life satisfaction. Data were collected from 93 participants. Participants' average life satisfaction score was 5.11 ($SD = 1.31$). One question asked how much participants agreed with the statement "I am satisfied with my life." The life satisfaction scale ranged from 1 (*strongly disagree*) to 7 (*strongly agree*). To test the hypothesis, a Pearson correlation analysis was conducted. The results did not find a significant relationship, $r(91) = .17$, $p = .112$ (see Figure 1).

The third hypothesis was that there would be a relationship between time spent in nature and biophilia. Data were collected from 93 participants. The biophilia subscale consisted of two items ($\alpha = 0.44$). On average, participants' biophilia score was 5.81 ($SD = 1.07$). Biophilia ratings ranged from 1 (*low biophilia*) to 7 (*high biophilia*). To test the relationship between time spent in nature and biophilia, a Pearson correlation analysis was conducted. The results were not significant, $r(91) = .01$, $p = .448$ (see Table 1).

Discussion

Upon analyzing survey data, we found that our data failed to support the hypotheses. Our first hypothesis was that time spent in nature would be related to how often someone is ill. These variables did not have a significant correlation. This was contradictory to past research, which found that people who spent more time outside are more likely to maintain physical health, most likely because they are participating in physical activities while outdoors (Frumkin, 2001). More significant results may have been evident if we provided participants with a more refined operational definition of nature and greenspace.

The hypothesis that time spent in nature is related to life satisfaction was also found to be insignificant. This was unexpected, considering that previous research found that spending more time in nature increased levels of life satisfaction and mental wellbeing (Anderson et al., 2018; Houlden et al., 2018). This may be due to the survey leaving the definition of life satisfaction ambiguous. No other questions were asked that adequately measured life satisfaction.

Time spent in nature did not have a significant relationship to biophilia. Biophilia was defined as perceived connectedness to nature, but both items meant to measure the variable tended to generate dissimilar responses from participants. Previous research found that spending time in nature increased biophilia (Bratman et al., 2012). This discrepancy may be due to the survey questions; one item focused on nature generally, while the other item focused on kinship with animals and plants.

Methodological Limitations

The free response questions may have been confusing and unclear. Several participants responded with a time range instead of an estimated average, which made it difficult to properly analyze the data. This study only included students enrolled in a CWI psychology course for convenience sampling, and is not fully representative of the larger population.

This study did not take into account sociocultural factors such as gender. Other studies conducted at the same time used students enrolled in CWI psychology courses in their sample and found the majority of participants were women. It is possible that our data may also include more responses from women than other genders.

Statistical Limitations

Several Pearson correlation tests were used to analyze the data. The variable of time spent in nature did not have a normal distribution (skewness = 2.07). Two outliers were observed in the data and were included in the analyses.

While this study failed to support our hypotheses, more research is necessary to further examine the relationship that humans have with the natural world as urban areas continue to develop. Future studies would benefit from utilizing more accurate methods of measuring participants' time spent in nature, as well as random sampling.

References

Anderson, C. L., Monroy, M., & Keltner, D. (2018). Awe in nature heals: Evidence from military veterans, at-risk youth, and college students. *American Psychological Association*, *18*(8), 1195–1202. http://dx.doi.org/10.1037/emo0000442

Bratman, G. N., Hamilton, J. P., & Daily, G. C. (2012). The impacts of nature experience on human cognitive function and mental health. *Annals of the New York Academy of Sciences*, *1249*, 118-136. https://doi.org/10.1111/j.1749-6632-2011.06400.x

Frumkin, H. (2001). Beyond toxicity: Human health and the natural environment. *American Journal of Preventive Medicine*, *20*(3), 234–240. https://doi.org/10.1016/s0749-3797(00)00317-2

Houlden, V., Weich, S., de Albuquerque, J. P., Jarvis, S., & Rees, K. (2018). The relationship between greenspace and the mental wellbeing of adults: A systematic review. *PLoS ONE*, *13*(9), Article e0203000. https://doi.org/10.1371/journal.pone.0203000

Martin, L., White, M. P., Hunt, A., Richardson, M., Pahl, S., & Burt, J. (2020). Nature contact, nature connectedness and associations with health, wellbeing and pro-environmental behaviours. *Journal of Environmental Psychology*, *68*, Article 101389. https://doi.org/10.1016/j.jenvp.2020.101389

Repke, M. A., Berry, M. S., Conway, L. G. III, Metcalf, A., Hensen, R. M., & Phelan, C. (2018). How does nature exposure make people healthier?: Evidence for the role of impulsivity and expanded space perception. *PloS ONE*, *13*(8), Article e0202246. https://doi.org/10.1371/journal.pone.0202246

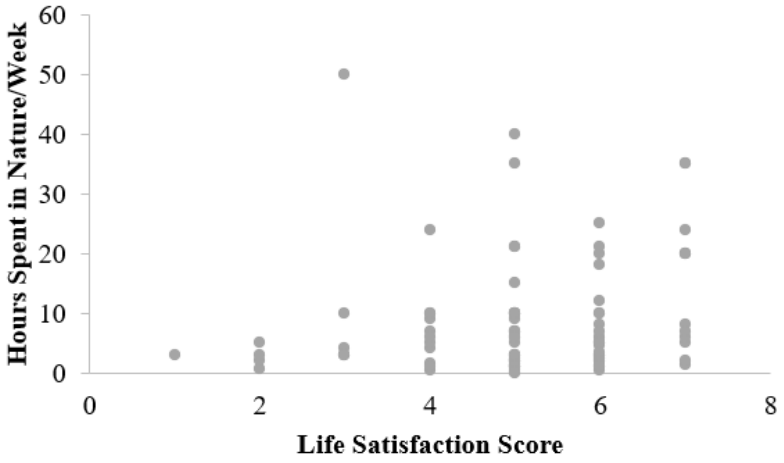
Table 1

Biophilia Descriptive Statistics

	M	*SD*	Minimum	Maximum	Skew
Natural community belongingness score	5.71	1.37	1.00	7.00	-1.08
Animal and plant kinship score	5.91	1.30	1.00	7.00	-1.33
Overall biophilia score	5.81	1.07	2.50	7.00	-0.74

Figure 1

Hours Spent in Nature as Related to Life Satisfaction



Note. These results were not significant, $r(91) = .17$, $p = .112$. Life satisfaction was not a function of time spent in nature.

Appendix A

Survey Questions

1. What is your age?
2. Do you live in a rural or urban area?
    a. Rural
    b. Urban
3. I feel disconnected from nature.
    a. Strongly Agree
    b. Agree
    c. Slightly Agree
    d. Neutral
    e. Slightly Disagree
    f. Disagree
    g. Strongly Disagree
4. I have difficulty focusing
    a. Strongly Agree
    b. Agree
    c. Slightly Agree
    d. Neutral
    e. Slightly Disagree
    f. Disagree
    g. Strongly Disagree
5. I enjoy being outside

a. Strongly Agree

b. Agree

c. Slightly Agree

d. Neutral

e. Slightly Disagree

f. Disagree

g. Strongly Disagree

6. I feel energized in greenspaces. (A "greenspace" can be considered as any area with plenty of natural features such as plants, grass, or water.)

a. Strongly Agree

b. Agree

c. Slightly Agree

d. Neutral

e. Slightly Disagree

f. Disagree

g. Strongly Disagree

7. I think of the natural world as a community to which I belong.

a. Strongly Agree

b. Agree

c. Slightly Agree

d. Neutral

e. Slightly Disagree

f. Disagree

g. Strongly Disagree

8. I enjoy indoor plants.

a. Strongly Agree

b. Agree

c. Slightly Agree

d. Neutral

e. Slightly Disagree

f. Disagree

g. Strongly Disagree

9. I am satisfied with my life.

a. Strongly Agree

b. Agree

c. Slightly Agree

d. Neutral

e. Slightly Disagree

f. Disagree

g. Strongly Disagree

10. I feel confident in my day-to-day activities.

a. Strongly Agree

b. Agree

c. Slightly Agree

d. Neutral

e. Slightly Disagree

f. Disagree

g. Strongly Disagree

11. I feel a kinship with animals and plants.

a. Strongly Agree

b. Agree

c. Slightly Agree

d. Neutral

e. Slightly Disagree

f. Disagree

g. Strongly Disagree

12. Going outside helps me feel rested.

a. Strongly Agree

b. Agree

c. Slightly Agree

d. Neutral

e. Slightly Disagree

f. Disagree

g. Strongly Disagree

13. I actively seek out opportunities to be in nature.

a. Strongly Agree

b. Agree

c. Slightly Agree

d. Neutral

e. Slightly Disagree

f. Disagree

g. Strongly Disagree

14. Do you have house plants?

a. Yes

b. No

15. On average, how many minutes or hours per week do you spend in nature when the weather permits? (Please indicate if your answer represents minutes or hours.)

16. How many minutes does it take you to access a greenspace you go to at least once a month? (A greenspace can be considered as any area with plenty of natural features such as plants, grass, or water.)

17. Do you have a garden?

a. Yes

b. No

18. I go to my local park when weather permits.

a. Always

b. Frequently

c. Sometimes

d. Occasionally

e. Never

19. I study next to windows.

a. Always

b. Frequently

c. Sometimes

d. Occasionally

e. Never

20. I listen to nature sounds.

a. Always

b. Frequently

c. Sometimes

d. Occasionally

e. Never

21. I exercise outdoors.

a. Always

b. Frequently

c. Sometimes

d. Occasionally

e. Never

22. I feel stressed.

a. Always

b. Frequently

c. Sometimes

d. Occasionally

e. Never

23. I feel optimistic about the future.

a. Always

b. Frequently

c. Sometimes

d. Occasionally

e. Never

24. I feel I am generally productive in my life.

a. Always

b. Frequently

c. Sometimes

d. Occasionally

e. Never

25. I go outside to relax.

a. Always

b. Frequently

c. Sometimes

d. Occasionally

e. Never

26. I feel happy.

a. Always

b. Frequently

c. Sometimes

d. Occasionally

e. Never

27. I feel anxious.

a. Always

b. Frequently

c. Sometimes

d. Occasionally

e. Never

28. I am ill.

a. Always

b. Frequently

c. Sometimes

d. Occasionally

e. Never

29. Where would you fall on this scale?

The environment does not affect me.

a. 1

b. 2

c. 3

d. 4

e. 5

I am very sensitive to the environment.

30. I remember information best when I study:

a. Outside

b. In an office

c. Next to a window

31. I go outside most often during:

    a. Winter

    b. Spring

    c. Summer

    d. Fall