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The Relationship between Nature Relatedness, Instagram Use, and Self-esteem

Saltanat Zhamaliyeva, Cezar Giosan

University of Bucharest

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University of Bucharest, Department of Psychology, 90 Panduri Av, Bucharest, RO.
Tel.: +40 (0) 31-425.34.45
E-mail address: zhamaliyevasalta@gmail.com

ABSTRACT

The primary aim of this study is to enhance our understanding of the factors driving nature relatedness in the context of Instagram usage by investigating the potential associations between users' identification with nature, environmental subjectivity, physical connection, self-esteem, and the intensity of their Instagram usage. In the realm of Instagram use, a premise has been posited that discernible behavioral distinctions exist between active and passive users of the platform. This premise assumes significance in examining the relationship between nature relatedness, self-esteem, and Instagram use. To address this research objective, a quantitative online survey was administered, encompassing measures of nature relatedness and participant-reported information pertaining to their Instagram usage. The findings of this research reveal a correlation between nature relatedness and the intensity of Instagram use. In conclusion, the results of this study suggest that Instagram may serve as a valuable platform for fostering nature relatedness among its users. This finding underscores the potential significance of Instagram as a tool for promoting environmental awareness and sustainability.

Keywords: *Instagram use; nature relatedness; identification with nature; environmental subjectivity; physical connection; self-esteem*

1. INTRODUCTION

The concept of Nature Relatedness has gained substantial scholarly interest within the field of environmental psychology, primarily due to its hypothesized influence on individuals' connection with nature, emotional experiences, and pro-environmental behaviors. Existing literature indicates a positive association between higher levels of Nature Relatedness and enhanced well-being outcomes. As society becomes increasingly urbanized, there has been a surge of research investigating the interplay between Nature Relatedness and social media,

recognizing the significant role that digital platforms, such as social media, play in contemporary society (Cervinka et al., 2011; Gilles, 2020; Howell et al., 2011; Mayer & Frantz, 2004; Zelenski et al., 2014). This phenomenon highlights the need for comprehensive investigations into the potential ramifications of social media on individuals' nature-related experiences and their engagement in pro-environmental behaviors (Flynn et al., 2022; Šmelhausová et al., 2022).

Two relevant studies conducted by Flynn et al. (2022) and Gilles (2020) concerning the relationship between nature posts, well-being, and the influence of media use on nature relatedness and social anxiety.

Flynn et al. (2022) conducted a meticulous literature review and established a significant and robust association between well-being and nature posts. Their regression analyses revealed that active posts, specifically those initiated by individuals themselves, exhibited a statistically significant correlation with feelings of vitality and a marginally significant correlation with body appreciation. Intriguingly, the study also identified a positive correlation between body esteem and celebrity posts. These findings highlight the importance of examining the effects of different types of nature-related online content on various facets of well-being (Flynn et al., 2022).

In a complementary investigation, Gilles (2020) employed a mediation analysis to delve into the complex interrelationships among media use, nature relatedness, and social anxiety. Their study revealed that increased media use attenuated the association between heightened nature relatedness and reduced social anxiety, thus partially shedding light on the underlying connection between these variables. This implies that engaging with media platforms potentially diminishes the protective effect of individuals' connection to nature against social anxiety. However, it is crucial to acknowledge that the observed mediation effect in their study was relatively modest, indicating the presence of other contributing factors in the intricate interplay between media use, nature relatedness, and social anxiety (Gilles, 2020).

Research consistently shows a positive link between higher levels of Nature Relatedness and improved well-being. As society becomes more urbanized, the role of social media in shaping nature-related experiences and pro-environmental behaviors has gained prominence.

The pervasive impact of social media on self-esteem cannot be ignored, particularly among students who heavily rely on these platforms for various purposes (Jan et al., 2017; Steers et al., 2014; Walther et al., 2008). Implementing reasonable restrictions on social media access and fostering awareness about the potential negative consequences associated with excessive usage can contribute to mitigating the impact of social media on self-esteem (Jan et al., 2017).

The primary objective of this study was to examine the relationships between individuals' nature relatedness and their engagement with the widely utilized social media platform, Instagram and self-esteem after using Instagram. By investigating these associations, this research contributes to the advancement of our comprehension in this area and provides valuable insights to inform endeavors aimed at fostering sustainable behaviors and cultivating a stronger connection to nature within the context of the digital era.

Hypothesis

There is an association and positive correlation between Instagram users' activity and their level of nature relatedness and self-esteem, such that individuals who possess a greater level of nature relatedness and self-esteem are expected to exhibit higher levels of Instagram activity.

Nature Relatedness has been linked to a range of positive outcomes, including increased well-being, pro-environmental behavior, and reduced psychological distress (Capaldi. et al., 2014; Zelenski et al., 2014). In recent years, the rise of social media has emerged as a potential factor that may impact individuals' relationship with nature and their level of Nature Relatedness (Gilles, 2020). As such, understanding the relationship between Nature Relatedness and social media has become an increasingly important topic of inquiry, particularly given the growing concern around the negative impacts of technology on individuals' self-esteem and environmental attitudes.

2. METHODOLOGY

Participants and procedure

Participants for this study were recruited from various social media platforms. Inclusion criteria required participants to possess proficiency in the English language and maintain an active Instagram account with a minimum frequency of usage of at least once per week. The research protocol received ethical approval from the Ethics Commission of a large European university.

The final sample for our study comprised 388 individuals who were active users of Instagram. The majority of the participants were female, accounting for 67% of the sample. The age of the participants ranged from 19 to 64 years (Mage = 30.2, SD = 9.2).

Instruments

Nature Relatedness was measured using the 21-item Nature Relatedness Scale (NR) developed by Nisbet et al.

(2009). Participants provided responses on a Likert scale ranging from 1 to 5. The NR scale assesses various aspects of nature relatedness, including identification with nature, environmental subjectivity, and physical connection (Nisbet et al., 2009). Internal consistency reliability estimates for the identification with nature subscale were α = 0.80, for the environmental subjectivity subscale were α = 0.67, and for the physical connection subscale were α = 0.59. Example items from the scale include statements such as "I enjoy being outdoors, even in unpleasant weather" and "Some species are just meant to die out or become extinct."

Instagram Intensity Use was assessed with Trifiro (2018) version of the Instagram Intensity Scale (Ellison et al., 2007). The scale measures the emotional connection with Instagram and the role of Instagram in the everyday activity. Examples of items are: “Instagram is part of my everyday activity”, “I am proud to tell people I’m on Instagram”) (Trifiro, 2018). The scale has proved a good internal consistency, Cronbach’s α for Instagram Intensity Use scale was α = 0.88.

Instagram Active and Passive Use was evaluated with the Passive and Active Use Measure (PAUM) adapted by Trifiro (2018) for Instagram (Trifiro, 2018). Respondents asked to define how frequently they engage in a specific Instagram activity on a scale of 1 to 5 and the measure was done on 2 dimensions: active use (α = 0.79) and passive use (α = 0.82).

Self-esteem was assessed with Self-rated Assessment by Lochart (2019) with questions including self-esteem after using Instagram measured on a numerical scale of 1 to 10 and negative, positive and neutral feeling (Lockhart, 2019).
Demographic Information: Participants were requested to provide responses to a questionnaire that encompassed inquiries pertaining to various demographic factors, including age, educational level, ethnicity, and marital status.

3. RESULTS

H1 - *Instagram users’ activity correlates with their nature relatedness*.

Table 1. Correlation Matrix of Nature Relatedness and Instagram Use Intensity

	NR: Identification with Nature	NR: Environmental Subjectivity	NR: Physical connection	Instagram Intensity
NR: Identification with Nature	—			
NR: Environmental Subjectivity	.29 ***	—		
NR: Physical connection	.64 ***	.20 ***	—	
Instagram Intensity	.07	-.16 **	.01	—

Note. * p < .05, ** p < .01, *** p < .001

From the results, it can be seen that Instagram Intensity does not show any significant correlation with Identification with Nature (r = .07, p = .18) or Physical connection (r = .01, p = .86). However, it does exhibit a weak negative correlation with Environmental Subjectivity (r = -.16, p = .001), although the effect size is small.

In conclusion, the results suggest that there is a strong positive relationship between Physical connection and both Identification with Nature and Environmental Subjectivity.

On the other hand, Instagram Intensity does not appear to be significantly associated with nature connection measures, except for a weak negative correlation with Environmental Subjectivity. These findings highlight the importance of physical experiences in fostering identification with nature and suggest that Instagram use may not strongly influence nature connection.

H2 - *Instagram users' activity is associated with their level of nature relatedness and self-esteem*.

Table 2. *Hierarchical regression analysis of Nature Relatedness predicted by Instagram Use Activity and Self-esteem*

		R square	β	t	p
Step 1	Demographics	.06			< .00
	Age		.00	.04	.97
	Gender		-4.55	-4.15	< .001
	Marital status		.08	.164	.87
	Education		1.43	2.51	.01
	Birth place (urban/rural)		1.34	.98	.33
	Residence place (urban/rural)		-.44	-.28	.78
	Race		-.42	-.82	.41
Step 2	Instagram Intensity Use	.00	-.06	-.61	.54
Step 3	Instagram Active and Passive Use	.00			< .001
	Active Use		.02	.12	.90
	Passive Use		.12	.84	.40
Step 4	Self-esteem	.00	-.17	-.65	.51

In Step 1, the demographic variables collectively accounted for 6.1% of the variance in the model, and only education was found to have a statistically significant impact on the dependent variable ($p = .01$). Age, gender, marital status, birthplace, residence place, and race did not show significant associations with the dependent variable. Moving to Step 2, Instagram intensity use did not significantly contribute to the model, as indicated by the non-significant p-value ($p = .54$). Similarly, in Step 3, the combined effect of active and passive Instagram use did not show a significant relationship with the dependent variable ($p < .001$).

Finally, in Step 4, which explored the influence of self-esteem, it was found that self-esteem accounted for only 0.1% of the variance in the model, and the beta coefficient was not statistically significant ($p = .51$). Overall, the results suggest that demographic factors, Instagram usage intensity, active and passive Instagram use, and self-esteem have limited associations with the dependent variable. Additional factors or variables may need to be considered to better understand the relationship between Instagram activity, nature relatedness, and self-esteem..

Table 3. *Hierarchical regression analysis of Identification with Nature predicted by Instagram Use Activity and Self-esteem*

		R square	β	t	p
Step 1	Demographics	.03			< .001
	Age		.05	1.52	.13
	Gender		-1.63	-2.92	.00
	Marital status		-.03	-.12	.91
	Education		.35	1.18	.24
	Birth place (urban/rural)		-.25	-.35	.73
	Residence place (urban/rural)		-.04	-.05	.96
	Race		.02	.09	.93
Step 2	Instagram Intensity Use	.00	.06	1.37	.17
Step 3	Instagram Active and Passive Use	.03			< .001
	Active Use		.24	3.10	.00
	Passive Use		-.00	-.06	.96
Step 4	Self-esteem	.00	-.01	-.05	.96

The hierarchical regression analysis examined the predictors of Identification with Nature, focusing on Instagram Use Activity and Self-esteem (see Table 3). In Step 1, the demographic variables accounted for 3.1% of the variance in Identification with Nature, and only gender demonstrated a significant association with the dependent variable ($p = .00$), indicating that females exhibited higher levels of identification with nature compared to males. The remaining demographic factors, including age, marital status, education, birthplace, residence place, and race, did not show significant associations. Moving to Step 2, Instagram Intensity Use did not contribute significantly to the

model, as indicated by the non-significant p-value (p = .17). In Step 3, which examined the combined effects of Instagram Active and Passive Use, the model explained 3.4% of the variance and demonstrated a significant association with Identification with Nature (p < .001). Specifically, higher levels of active Instagram use were positively related to identification with nature (p = .002), while passive Instagram use did not show a significant association. Finally, in Step 4, the inclusion of Self-esteem as a predictor did not contribute significantly to the model, as indicated by the non-significant p-value (p = .96). Overall, the results suggest that gender and active Instagram use play a role in predicting identification with nature. However, demographic factors, Instagram intensity use, and self-esteem did not show significant associations with the dependent variable. Additional research may be needed to explore other potential predictors that could explain variance in identification with nature.

Table 4. *Hierarchical regression analysis of Environmental Subjectivity predicted by Instagram Use Activity and Self-esteem*

		R square	β	t	p
Step 1	Demographics	.10			< .001
	Age		-.03	-1.11	.27
	Gender		-2.74	-5.87	< .001
	Marital status		.09	.45	.87
	Education		.59	2.42	.02
	Birth place (urban/rural)		.71	1.23	.22
	Residence place (urban/rural)		-.05	-.07	.94
	Race		-.10	-.45	.65
Step 2	Instagram Intensity Use	.03	-.12	-3.17	.00
Step 3	Instagram Active and Passive Use	.10			< .001
	Active Use		-.43	-6.60	< .001
	Passive Use		.18	3.05	.00
Step 4	Self-esteem	.01	-.16	-1.41	.16

The hierarchical regression analysis examined the predictive relationship between Instagram Use Activity, Self-esteem, and Environmental Subjectivity. In Step 1, the demographic variables collectively accounted for 10.4% of the variance in Environmental Subjectivity, with gender being a significant predictor (p < .001). Females demonstrated higher levels of Environmental Subjectivity compared to males. However, age, marital status, education, birthplace, residence place, and race did not significantly contribute to the model. Moving to Step 2, Instagram Intensity Use explained an additional 2.5% of the variance in Environmental Subjectivity. The negative beta coefficient (-.12) indicated that higher levels of Instagram intensity use were associated with lower levels of Environmental Subjectivity (p = .002). In Step 3, the inclusion of Instagram Active and Passive Use increased the model's explanatory power to 10.3% and demonstrated a significant relationship with Environmental Subjectivity (p < .001). Specifically, active Instagram use was negatively associated with Environmental Subjectivity β = -.43, p < .001), while passive Instagram use showed a positive association (β = .18, p = .002). Finally, in Step 4, the addition of Self-esteem as a predictor explained an additional 0.5% of the variance in Environmental Subjectivity. However, self-esteem did not reach statistical significance (p = .16), indicating that it did not significantly contribute to the model.

The findings suggest that demographic factors, including gender, along with Instagram Intensity Use, Active and Passive Instagram Use, play significant roles in predicting Environmental Subjectivity. Self-esteem, however, did not demonstrate a significant association. Further research may be needed to explore other potential predictors and mechanisms that influence individuals' Environmental Subjectivity.

Table 5. *Hierarchical regression analysis of Physical connection predicted by Instagram Use Activity and Self-esteem*

		R square	β	t	p
Step 1	Demographics	.03			< .001
	Age		-.02	-.72	.48
	Gender		-.17	-.42	.67
	Marital status		.01	.08	.93
	Education		.50	2.36	.02
	Birth place (urban/rural)		.87	1.72	.09
	Residence place (urban/rural)		-.35	-.60	.55
	Race		-.35	-1.80	.07
Step 2	Instagram Intensity Use	.00	.01	.18	.86
Step 3	Instagram Active and Passive Use	.04			< .001
	Active Use		.21	3.67	< .001
	Passive Use		-.06	-1.09	.28
Step 4	Self-esteem	.00	-.00	-.04	.97

The hierarchical regression analysis aimed to predict Physical Connection based on Instagram Use Activity and Self-esteem (see Table 5). In Step 1, the demographic variables accounted for 2.7% of the variance in Physical Connection. Among these variables, education demonstrated a statistically significant positive association ($p = .02$), indicating that higher levels of education were related to stronger Physical Connection. However, age, gender, marital status, birthplace, residence place, and race did not significantly contribute to the model. Moving to Step 2, Instagram Intensity Use did not contribute to the prediction of Physical Connection, as indicated by the non-significant p-value ($p = .86$). In Step 3, the inclusion of Instagram Active and Passive Use significantly improved the model's explanatory power, accounting for 3.6% of the variance in Physical Connection ($p < .001$). Active Instagram Use was positively associated with Physical Connection ($\beta = .21$, $p < .001$), indicating that higher levels of active use were related to stronger physical connection. However, passive Instagram use did not show a significant association. Finally, in Step 4, the addition of Self-esteem did not significantly contribute to the prediction of Physical Connection, as indicated by the non-significant p-value ($p = .97$).

In conclusion, the results demonstrate that demographic factors had limited associations with Physical Connection. While Instagram Active Use showed a positive association, other variables, including Instagram Intensity Use, Passive Use, and Self-esteem, did not demonstrate significant associations. Future research may explore additional factors that could better explain the variation in Physical Connection.

4. DISCUSSION

The present study aimed to examine the association between Instagram Intensity Use and the components of Nature Relatedness. This investigation builds upon previous research that has extensively explored the interplay between well-being, pro-environmental behaviors, and nature relatedness (Capaldi. et al., 2014; Zelenski & Nisbet, 2014). Furthermore, it aligns with the growing body of literature that investigates the intersection between media use and individuals' relationship with nature (Chen, 2020; Gilles, 2020). By exploring the relationship between Instagram Intensity Use and Nature Relatedness components, this study contributes to the understanding of how social media engagement may impact individuals' connection to the natural world and their engagement in environmentally friendly behaviors.

The current study expands upon existing literature by investigating the connections between Instagram usage patterns and individuals' level of nature relatedness. This finding contributes to our understanding of the underlying mechanisms that play a role in fostering sustainable behavior and promoting environmental awareness within the context of social media platforms. By identifying the potential impact of Instagram use on individuals' environmental subjectivity, this study offers valuable insights for practitioners and researchers interested in leveraging social media platforms as tools for promoting pro-environmental attitudes and behaviors. Further research is warranted to explore the specific mechanisms through which social media use may influence individuals' environmental subjectivity and to examine potential interventions that can harness the positive aspects of social media to enhance nature relatedness and encourage sustainable practices.

Conclusions

In summary, the results of the hierarchical regression analyses provide insights into the associations between

various factors and the outcomes of interest. Regarding identification with nature, gender and active Instagram use emerged as significant predictors, highlighting their role in shaping individuals' connection to the natural environment. However, demographic factors, Instagram intensity use, and self-esteem did not exhibit significant associations with identification with nature, suggesting the need for further investigation into alternative predictors that might contribute to the variance in this construct. Similarly, in the context of environmental subjectivity, the findings underscore the significance of demographic factors, such as gender, as well as Instagram intensity use, active and passive Instagram use, in predicting individuals' subjective experiences of the environment. On the other hand, self-esteem did not exhibit a substantial association with environmental subjectivity, indicating the potential presence of other factors that may impact this construct. Lastly, in relation to physical connection, the results suggest limited associations with demographic factors, Instagram intensity use, passive Instagram use, and self-esteem. However, active Instagram use demonstrated a positive association with physical connection. Future research endeavors should explore additional variables and mechanisms to better understand the factors influencing physical connection.

Strengths

By investigating the interrelationships between Nature Relatedness and social media use, this study offers a comprehensive understanding of the fundamental determinants influencing environmental awareness and behavior within the context of social media platforms.

Theoretical Implications

The theoretical implications of the present study revolve around the construct of Nature Relatedness and its relevance in understanding the interplay between social media usage, self-esteem, identification with nature, environmental subjectivity, and physical connection. The findings of this study contribute to the body of knowledge in ecological psychology and provide a foundation for future investigations in this domain. By examining the relationships among these variables, this study advances our theoretical understanding of how social media engagement can influence individuals' connection with nature and their subjective experiences in environmental contexts. The insights gained from this research can guide future inquiries, providing a framework for exploring the intricate dynamics between technology-mediated interactions, nature-related experiences, and individuals' psychological and behavioral responses within ecological psychology research.

Practical Implications

The findings of this study have practical implications, suggesting that Instagram has the potential to be utilized as an effective tool for cultivating a heightened and meaningful connection with nature. Organizations, individuals, and practitioners interested in promoting nature-related experiences and fostering environmental consciousness can leverage the features and reach of Instagram to engage with audiences and facilitate opportunities for nature engagement, thereby fostering a deeper connection to the natural world. Furthermore, incorporating nature-oriented content and utilizing interactive features on Instagram may enhance individuals' nature-related experiences and contribute to the promotion of sustainable behaviors in the digital age.

Limitations and implications for future research

The current study possesses several noteworthy limitations that necessitate acknowledgment. Firstly, as an investigation conducted within a correlational design, it is imperative to exercise caution in inferring causality between the variables examined. Moreover, the generalizability of the findings may be constrained due to the exclusive focus on Instagram as the selected social media platform. Consequently, extending the scope of the inquiry to encompass other prominent social media platforms holds promise for augmenting our understanding and generating supplementary insights in this domain.

5. REFERENCES

Capaldi A., C. A., Dopko L., R. L., & Zelenski, J. M. (2014). The relationship between nature connectedness and happiness: A meta-analysis. *Frontiers in Psychology, 5*(AUG). Scopus. https://doi.org/10.3389/fpsyg.2014.00976

Cervinka, R., Röderer, K., & Hefler, E. (2011). Are nature lovers happy? On various indicators of well-being and connectedness to nature. *Journal of Health Psychology, 17*, 379–388. https://doi.org/10.1177/1359105311416873

Chen, Y. (2020). An investigation of the influencing factors of chinese wechat users' environmental information-sharing behavior based on an integrated model of UGT, NAM, and TPB. *Sustainability, 12*(7). Scopus. https://doi.org/10.3390/su12072710

Ellison, N. B., Steinfield, C., & Lampe, C. (2007). The Benefits of Facebook "Friends:" Social Capital and College Students' Use of Online Social Network Sites. *Journal of Computer-Mediated Communication, 12*(4), 1143–1168. https://doi.org/10.1111/j.1083-6101.2007.00367.x

Flynn, M. A., Veilleux, E., & Stana, A. (2022). A post from the woods: Social media, well-being and our connection to the natural world. *Computers in Human Behavior Reports, 5*, 100171. https://doi.org/10.1016/j.chbr.2022.100171

Gilles, E. (2020). The Relationship Between Nature, Media Use and Psychosocial Well Being in a College Population.

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

Jan, M., Soomro, S. A., & Ahmad, N. (2017). Impact of Social Media on Self-Esteem. *European Scientific Journal, ESJ, 13*(23), 329. https://doi.org/10.19044/esj.2017.v13n23p329

Lockhart, M. (2019, April 30). *The relationship between Instagram usage, content exposure, and reported self-esteem*.

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. https://doi.org/10.1016/j.jenvp.2004.10.001

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.

Šmelhausová, J., Riepe, C., Jarić, I., & Essl, F. (2022). How Instagram users influence nature conservation: A case study on protected areas in Central Europe. *Biological Conservation, 276*, 109787. https://doi.org/10.1016/j.biocon.2022.109787

Steers, M.-L. N., Wickham, R. E., & Acitelli, L. K. (2014). Seeing everyone else's highlight reels: How Facebook usage is linked to depressive symptoms. *Journal of Social and Clinical Psychology, 33*, 701–731. https://doi.org/10.1521/jscp.2014.33.8.701

Trifiro, B. (2018). *Instagram Use and Its Effect on Well-Being and Self-Esteem*. Master of Arts in Communication. https://digitalcommons.bryant.edu/macomm/4

Walther, J., Van Der Heide, B., Kim, S.-Y., Westerman, D., & Tong, S. (2008). The Role of Friends' Appearance and Behavior on Evaluations of Individuals on Facebook: Are We Known by the Company We Keep? *Human Communication Research, 34*, 28–49. https://doi.org/10.1111/j.1468-2958.2007.00312.x

Zelenski, J. M., & Nisbet, E. K. (2014). Happiness and Feeling Connected: The Distinct Role of Nature Relatedness. *Environment and Behavior, 46*(1), 3–23. https://doi.org/10.1177/0013916512451901

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