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CONNECTEDNESS TO NATURE AND SOCIODEMOGRAPHIC VARIABLES IN ECUADORIAN UNIVERSITY STUDENTS

Javier ÁVILA-LARREA[1]
Adriana MORA BERNAL[2]

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***Abstract**: This study examines the relationship between the Connectedness to Nature Scale (CNS) and traditional sociodemographic variables—age, sex, place of residence, and socioeconomic status (SES)—among university students, with a focus on the contextual influence of a female-majority academic environment. Utilizing a cross-sectional design, data were collected from 396 psychology students (66% female, 34% male) who were selected via stratified probabilistic sampling. The normality tests (Shapiro-Wilk and Kolmogorov-Smirnov) indicated non-parametric distributions for the CNS, necessitating the implementation of Spearman's correlation, Kruskal-Wallis, and Mann-Whitney U tests. The findings indicated an absence of a statistically significant association between CNS and SES ($\rho = -0.023$, $p = 0.652$) or age ($\rho = 0.041$, $p = 0.415$). Additionally, no significant differences were observed in CNS across urban/rural residency ($U = 19878.5$, $p = 0.710$) or sex ($U = 16244.5$, $p = 0.271$), with negligible effect sizes ($r < 0.07$). A Kruskal-Wallis analysis confirmed homogeneity in CNS across SES categories ($H(3) = 2.61$, $p = 0.456$, $\varepsilon^2 = 0.007$). These findings challenge conventional models linking sociodemographic disparities to environmental perceptions, suggesting that institutional factors in homogeneous academic settings—such as equitable access to green spaces and gender-balanced socialization—may neutralize structural inequalities. The study underscores the potential of academic institutions to function as egalitarian spaces that foster nature connectedness, irrespective of students' backgrounds. Future research should explore psychosocial mediators (e.g., environmental identity) and replicate findings in diverse academic contexts to generalize these insights.*

[1] Economist, Professor at the University of Cuenca (Ecuador), Faculty of Psychology. Researcher at the Department of Water Resources and Environmental Sciences, University of Cuenca. E-mail: javier.avila@ucuenca.edu.ec. ORCID ID 0000-0002-4056-4316.

[2] Lawyer, Professor at the Catholic University of Cuenca (Ecuador), Faculty of Social Sciences. Researcher. E-mail: adrimoraber@gmail.com. ORCID ID 0000-0002-1223-6905.

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Introduction

In the context of educational communities, environmental sustainability is a critical component in facilitating the transition towards more sustainable societies. Higher education institutions are responsible for training the future leaders of society and are also key actors in the implementation of the Sustainable Development Goals (SDGs) of the United Nations (Žalėnienė & Pereira, 2021). Education for sustainability (EfS) is a multifaceted concept that aims to transform institutional culture by integrating sustainable principles into various facets of institutional life, including teaching, research, and campus operations. This holistic approach, which encompasses both academic and administrative activities, is a key component of EfS (Warwick, 2016).

University students occupy a pivotal role as agents of change, promoting sustainability within their institutions and in the communities with which they are affiliated. They frequently spearhead sustainability initiatives on campuses, serving as catalysts, facilitators, and ambassadors for these causes (Mohamad et al., 2021). For instance, the University of Wyoming offers an illustrative example of students' role as agents of change, forging informal university-community partnerships and propelling sustainability initiatives even in the absence of formal institutional frameworks (Budowle et al., 2021). These experiences underscore the transformative potential of student participation and underscore the need to strengthen their involvement in sustainable strategies on a global scale.

A body of research has identified a psychological dimension conducive to the promotion of pro-environmental behaviors: a sense of connectedness with nature. This concept encompasses a person's emotional and cognitive relationship with the natural environment. Several studies have demonstrated that it functions as a significant predictor of these behaviors (Anderson & Krettenauer, 2021; Geng et al., 2015; Martin et al., 2020; Whitburn et al., 2019). Beyond deliberate behaviors, the connection to nature has also been demonstrated to influence spontaneous responses, suggesting that both explicit and implicit relationships with the natural environment are critical in promoting sustainable actions (Geng et al.,

2015). In addition, research has identified this connection as a mediator between exposure to nature and pro-environmental behaviors. This finding suggests that physical contact with the environment may be insufficient without an underlying psychological link (Rosa et al., 2018; Whitburn et al., 2019).

Furthermore, a connection with nature has been demonstrated to be associated with eudaimonic well-being, as evidenced by an increased sense of purpose and personal fulfillment among individuals who experience a profound bond with their natural environment (Ibáñez-Rueda et al., 2020; Martin et al., 2020). This emotional bond is often strengthened through direct experiences with nature from an early age, which increases the likelihood of sustainable behaviors in adulthood (Rosa et al., 2018). Consequently, from educational and community perspectives, the promotion of connectivity with nature has the potential to increase the adoption of pro-environmental practices and to improve personal and collective well-being, thereby establishing a bridge to global sustainability.

Sociodemographic factors have been demonstrated to exert a substantial influence on the human-nature connection, thereby affecting how individuals perceive and interact with their natural surroundings. Research conducted in the European Union underscores the considerable impact of gender and economic prosperity on this connection, demonstrating that women and individuals with greater economic stability tend to report higher levels of connection with nature (Mikusiński et al., 2023). Similarly, age has been identified as a salient factor. Research conducted in both rural and urban contexts in Michigan indicates that older individuals, due to their greater experience and time interacting with the environment, exhibit a stronger relationship with nature (Fleck et al., 2021).

The geographical location of residence has been demonstrated to exert an influence on this association. Individuals residing in rural areas, due to their increased exposure to the natural environment, exhibit a stronger emotional and cognitive bond with nature (Fleck et al., 2021; Macias-Zambrano et al., 2024a). Finally, socioeconomic factors emerge as pivotal determinants. Individuals with lower economic status exhibit heightened environmental concerns, while those with greater economic resources tend to engage in more sustainable consumption behaviors. This suggests that material conditions influence both the perception of environmental problems and pro-environmental actions (Kirsten & Eligius Biyase, 2023).

The concept of environmental connectivity has been demonstrated to be associated with positive mental and psychological outcomes, particularly in urban contexts where access to natural environments is restricted. Research findings indicate that college students with stronger connections to nature exhibit reduced levels of stress and depression, along with higher levels of life satisfaction (Chytrý et al., 2022; Schönbach et al., 2022). However, this association is not uniform and is mediated by socioeconomic status (SES). Students from higher SES contexts tend to enjoy privileged access to green spaces and resources that allow them to participate in outdoor activities, such as sports and excursions, which strengthens their relationship with nature. Conversely, individuals from lower SES backgrounds encounter obstacles such as restricted access to quality natural areas, financial limitations, and the obligation to prioritize occupational or familial commitments, which curtails their prospects for engagement with the natural environment (Tomaszewski et al., 2022, 2024).

These inequalities underscore the necessity of implementing institutional strategies, such as the creation of green spaces on campuses, the development of programs that encourage outdoor activities, and the formulation of policies that minimize economic barriers. These measures are designed to promote the connectedness of university students from disadvantaged backgrounds to nature. The implementation of such initiatives would not only contribute to enhancing the mental health and well-being of students but also serve to reinforce institutional commitment to sustainability.

The central objective of this study is to examine the relationship between connectedness to nature (CNS) and conventional sociodemographic variables, including age, sex, place of residence, and socioeconomic level, among Ecuadorian university students.Additionally, we aim to identify significant disparities in CNS among groups categorized by these key sociodemographic characteristics. The attainment of these objectives will provide contextualized evidence on possible inequalities in the perception of and connection to the natural environment within the university population in Ecuador. Furthermore, the study will inform institutional interventions that promote environmental equity and psychosocial well-being in this academic context.

Literature Review

The concept of "connectedness to nature" is understood to signify the relationship that individuals establish with the natural environment, constituting a bond that can be both emotional and cognitive in nature. The measurement of this phenomenon is facilitated by the Connectedness to Nature Scale (CNS), a widely recognized instrument developed by Mayer and Frantz in 2004. The instrument's primary focus is on assessing individuals' subjective cognitive connection with nature, emphasizing beliefs about interdependence with the natural environment rather than emotional aspects (Mayer & Frantz, 2004; Navarro et al., 2017; Perrin & Benassi, 2009). Their approach has contributed to a more profound comprehension of the manner in which cognitive beliefs influence the establishment of relationships with the natural environment and the promotion of sustainable behaviors.

In Spanish-speaking contexts, the Connectedness to Nature Scale (CNS) has been adapted and validated to ensure its cultural and linguistic applicability, achieving adequate levels of internal consistency and convergent and discriminant validity (Olivos et al., 2013; Pasca et al., 2017). A notable illustration is the condensed seven-item version, which, through analyses grounded in Item Response Theory, has demonstrated its efficacy and reliability in measuring connectedness to nature across diverse populations (Pasca et al., 2017). In addition, the scale has demonstrated positive correlations with constructs such as environmental identity and environmental concerns, thereby reinforcing its usefulness in predicting pro-environmental behaviors in different cultural contexts (Gkargkavouzi et al., 2021; Hatty et al., 2020; Navarro et al., 2017). These adaptations underscore the importance of robust tools to explore and understand how connection with nature is established in different regions of the world.

The degree to which individuals feel connected to nature is influenced by a complex interplay of sociodemographic characteristics, cultural influences, and environmental contexts. Gender emerges as a significant differentiating factor in this relationship. Women tend to report a stronger sense of attachment to the natural environment, often attributed to their social roles, engagement in recreational activities such as hiking, and intrinsic motivations related to environmental preservation (van der Linden, 2018). However, gender stereotypes, such as beauty ideals, may

generate dissonance between body perception and connection to nature in certain female groups, evidencing the complexity of this relationship (Whitburn et al., 2020). On the other hand, the place of residence (urban vs. rural) configures substantial differences. A study conducted in Gipuzkoa, Spain, revealed that rural residents establish a more profound connection with nature due to their daily exposure to natural environments. In contrast, urban residents' perception of green spaces as "less authentic" and socioeconomic barriers impede this linkage, particularly among lower-income groups (Olivos & Aragonés, 2011). A comparative study confirmed that rural residents score higher on affective and cognitive dimensions, underscoring the role of geographic context in the construction of environmental identities (Olivos et al., 2013).

Secondly, age influences connections to nature in dynamic ways. During the developmental stages of childhood and adolescence, repeated exposure to natural environments, such as camping, has been shown to cultivate enduring pro-environmental attitudes (Chawla, 1998). For young adults (18-25 years), academic decisions (e.g., pursuing a career in environmental studies vs. engineering) influence their interactions with nature, reflecting variations in education and daily practices (Clayton, 2003). Conversely, older adults exhibit a more profound connection to nature, which is associated with the accumulation of life experiences and the valorization of nature as a source of emotional restoration (Pasca & Aragonés, 2021). Rural women exhibit a more profound connection to nature compared to their urban counterparts, largely attributable to their historical roles in natural resource management and their inherent access to natural environments. In Latin America and the Caribbean, for instance, rural women are recognized as "natural guardians of life, food, care of nature, mother earth and healthy seeds" (PNUD, 2023, p. 16). In contrast, young adults in urban areas encounter significant obstacles in their interactions with nature. Conversely, children in rural areas, irrespective of their age, exhibit positive environmental attitudes (Castell, 2020; Favara & Moreno, 2020). These findings underscore the necessity for community policies that consider sociodemographic intersections to promote environmental justice and collective well-being (Brinkley & Wagner, 2024; Lehnert, 2022).

Socioeconomic status (SES) has been identified as a significant predictor of individuals' sense of connection to nature, with access to green spaces

and recreational opportunities serving as mediating factors. Research conducted by Soga et al. (2015) indicates that individuals with low SES residing in urban areas have reduced access to quality natural areas, which in turn leads to a diminished emotional connection to the environment. This phenomenon is further substantiated by the observations of Franzini et al. (2010) and Wijtzes et al. (2014), who noted that economic inequality imposes limitations on outdoor activities. Moreover, the lack of economic resources hinders engagement in ecotourism and environmental education, which are pivotal in fostering connectivity (Bello et al., 2017).

The interaction between SES and sociodemographic characteristics serves to amplify existing disparities. For instance, rural women with low SES tend to associate nature more with utilitarian activities, such as agriculture, while those with high SES tend to link it more with recreational activities (De & Ghosh, 2016; Macias-Zambrano et al., 2024b). In urban environments, low-SES adolescents exhibit a reduced sense of connection with conservation concepts, possibly due to the physical distance between their residences and green spaces (Rehling et al., 2021). This phenomenon highlights existing inequalities in environmental health. These dynamics underscore the need for policies that integrate socioeconomic equity and environmental justice (Brinkley & Wagner, 2024; Okereke, 2006).

The relationship between socioeconomic status (SES) and connectedness to nature in university students has not been sufficiently explored in the extant literature. While studies conducted in Spanish universities have identified that sustainable consumption does not invariably translate into pro-environmental attitudes or a heightened sense of connection with nature (Fernández et al., 2020), there remains a pressing need to elucidate how individual actions are internalized as environmental commitment within educational settings. A comparative study conducted in European Union countries, including Greece, Poland, and Sweden, has revealed that sociodemographic factors, such as gender, and value orientations exert a more significant influence on connectedness to nature compared to environmental variables in and of themselves. This highlights that individuals with greater economic prosperity and women demonstrate higher levels of connectedness (Mikusiński et al., 2023). This finding underscores the potential yet underutilized role of NSE in university populations. While universal educational initiatives have the potential to fortify this bond (Mikusiński et al., 2023; Neurohr et al., 2023), the

heterogeneity inherent in cultural and contextual differences demands specific studies that examine the intricate interplay among SES, sociodemographic dynamics, and values at the university level, particularly in regions characterized by pronounced socioeconomic disparities.

Methodology

The present study employed quantitative, cross-sectional, and observational research design. The study's population comprised university students enrolled in the Faculty of Psychology at the University of Cuenca (Ecuador). A total sample of 396 participants (132 men and 264 women) was recruited. The study's design was informed by methodologies employed in research on socio-environmental inequalities (Bryman, 2012), employing a two-stage probability sampling technique. In the first stage, the population was stratified by academic semesters, and in the second stage, students were randomly selected from each course, ensuring proportional representation by stratum. The inclusion criteria were as follows: first, the students were required to be actively enrolled; second, they had to belong to any academic semester; third, they had to have voluntarily agreed to participate in the study (informed consent); and fourth, they had to have time to complete the instruments.

The sample size was calculated a priori using G*Power 3.1 software (Faul et al., 2007). To ensure a statistical power of 80% ($\beta = 0.20$) in detecting a small-medium effect (Cohen's $d = 0.3$) in comparisons by sex (t-test for independent groups), with a significance level of $\alpha = 0.05$ and an allocation ratio of 2 (women:men) due to the proportion of these groups in the population, a sample of 396 participants was required.

The present study sought to evaluate the relationship between socioeconomic status (SES) and connectedness to nature in university students. To this end, three validated instruments were utilized. Initially, a sociodemographic card was employed to collect fundamental variables, including sex, age, and urban-rural area of residence, adhering to standardized protocols for psychosocial studies (Da Silva et al., 2021). Secondly, the Socioeconomic Level Stratification Survey of the National Institute of Statistics and Census of Ecuador (INEC, 2024) was employed to categorize SES using established indicators of economic characteristics, parental education, and access to fundamental services.

This survey is frequently utilized in local research due to its contextual validity. The levels that can be obtained are: high, upper middle, typical middle, lower middle, and low. Thirdly, the Spanish version of the Connectedness to Nature Scale (CNS) was administered. The aforementioned scale is a tool used to measure the subjective cognitive connection between individuals and nature. This scale has been extensively researched in Anglo-Saxon contexts and has been adapted for use in Spanish-speaking contexts. The CNS has been demonstrated to primarily assess cognitive beliefs concerning connection to nature, as opposed to emotional connections (Olivos et al., 2013; Perrin & Benassi, 2009). In a recent study, the Spanish version of the CNS was analyzed using Item Response Theory. The analysis identified seven items (2, 5, 6, 7, 9, 10, and 11) that demonstrated adequate discrimination and difficulty indices, along with a satisfactory overall fit. These items were selected to form a reduced version of the scale, which proved to have adequate levels of reliability and validity (Pasca et al., 2017). This selection of items was undertaken to minimize cultural biases and ensure a robust measurement of the construct in university contexts, aligning with recommendations for studies in Latin America (Zolopa et al., 2024).

The data collection procedure was designed in accordance with international ethical standards and institutional guidelines. Following the acquisition of authorization from the relevant academic authorities, data collection was conducted in designated classrooms. Informed consent was obtained by the participants, detailing the objectives of the study, the confidentiality of the data (anonymous coding), and the freedom to withdraw at any time. This was in accordance with the principles of autonomy and non-maleficence as outlined by the APA (American Psychological Association) norms. The participants received the instruments (sociodemographic form, INEC SES survey, and CNS) in physical format, with clear instructions to minimize comprehension bias. The entire process was overseen by trained researchers and adhered to the criteria of scientific integrity and respect for the dignity of the participants established in the Declaration of Helsinki.

The statistical analyses were designed based on the nature of the variables and distribution assumptions. Initially, the normality of the connectivity with nature (CNS) variable was assessed using the Shapiro-Wilk test (for groups with $n < 50$) and the Kolmogorov-Smirnov test (for groups with $n \geq 50$), detecting a non-normal distribution ($p < 0.001$). Therefore, non-

parametric methods were chosen for all comparisons. The relationship between socioeconomic status (SES) and CNS was analyzed using the Spearman correlation coefficient (rho), while differences between SES groups were assessed using the Kruskal-Wallis test (H). For binary comparisons (sex: men vs. women; residence: urban vs. rural), the Mann-Whitney U test was applied, reporting the U statistic and the magnitude of the effect (r). Homogeneity of variances was verified with Levene's test, and statistical power was calculated a priori using G*Power 3.1, ensuring a power ≥ 80% for small-medium effects ($d = 0.3$, $\alpha = 0.05$). All analyses were performed primarily in JASP, while SPSS software was used for normality testing, employing a significance threshold of $\alpha = 0.05$ and reporting 95% confidence intervals.

Results

The sample comprised 396 university students who were selected through probabilistic sampling, ensuring a representative sociodemographic distribution of the Faculty of Psychology. The proportion of women (66%, n = 264) and men (34%, n = 132) aligns with the prevailing trend of increased female representation in this academic field. The sample included students from the second level (n = 160), the fourth level (n = 54), the sixth level (n = 85), and the eighth level (n = 97).

The average age of women was M = 20.7 years (SD = 2.29), and that of men was M = 21.3 years (SD = 3.21), with no statistically significant differences between the groups. With respect to geographical location, 70% of the participants (n = 277) resided in urban areas, while 30% (n = 119) resided in rural areas, thereby reflecting a geographic diversity relevant to the analysis of connectivity with nature.

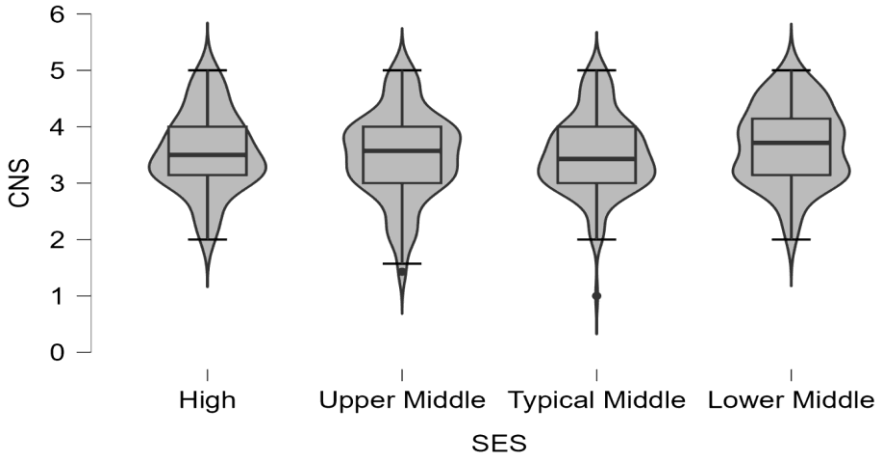
The SES of the participants was assessed through the INEC Socioeconomic Level Stratification Survey, which categorized the students into four distinct groups based on their SES: high level (9%, n = 36), upper-middle level (36.6%, n = 145), typical middle level (39.4%, n = 156), and lower-middle level (14.9%, n = 59). It is noteworthy that no participants were classified in the low level category.

Given that the Kolmogorov-Smirnov test indicated that SES follows a normal distribution ($p = 0.200$), but the nature connectivity variable

(NCU) does not (p = 0.000), Spearman's correlation was used to examine their relationship. The findings revealed no statistically significant association (ϱ = -0.023, p = 0.652), indicating that socioeconomic status does not significantly influence the perception of nature connectivity in this sample.

To further compare groups, the normality of the CNS variable within each SES category was assessed using the Kolmogorov-Smirnov and Shapiro-Wilk tests. Significant deviations were found in the upper-middle-class and typical-middle-class categories. Consequently, the nonparametric Kruskal-Wallis test was applied, the results of which did not reveal significant differences in nature connectivity between the different socioeconomic levels (H(3) = 2.611, p = 0.456). The magnitude of the effect, estimated using ε^2, was 0.007, indicating a very small effect. The findings suggest that socioeconomic status does not significantly differentiate nature connectivity among university students (Figure 1).

Figure 1. Distribution of Connectedness with Nature (CNS) scores by Socioeconomic Level (SES).



Note: Overlapping densities and similarity in medians reflect the absence of significant differences between groups (H(3) = 2.611, p = 0.456, ϵ^2 = 0.007). Quartiles (inner boxes) and dispersion (violin width) indicate comparable variability between strata.

In order to examine the possible association between age and connectivity with nature, a Spearman correlation was applied. This analysis revealed a

positive but non-significant relationship (ϱ = 0.041, p = 0.415). This finding suggests that, within the context of this particular sample, age does not exert a substantial influence on individuals' perceptions of connectivity with nature.

To further explore potential disparities in nature connectivity between students residing in urban and rural environments, the Mann-Whitney test was employed. The outcomes of this evaluation revealed no statistically significant differences (U = 17162.500, p = 0.513, r = 0.063), suggesting a negligible effect size. This finding suggests that the geographical location of residence does not significantly influence the perception of connection with nature in this specific population.

A similar approach was adopted to assess gender disparities in connectivity with nature. The Mann-Whitney test revealed no statistically significant differences between the groups (U = 16244.500, p = 0.271, r = 0.062), suggesting a negligible effect size. These findings imply that sex does not act as a differentiating factor in the perception of connectivity with nature within this sample.

The findings indicate a striking uniformity in the perception of connectedness with nature (CNS) among university students, irrespective of conventional sociodemographic variables. Contrary to theoretical predictions, no significant differences in CNS were identified between socioeconomic levels (H(3) = 2.61, p = 0.456; minimum effect: ε^2 = 0.007), despite the diversity in socioeconomic status (9% high, 36.6% upper-middle, 39.4% typical-middle, 14.9% lower-middle). Similarly, age (ϱ = 0.041, p = 0.415), place of residence (urban vs. rural: U = 17162.5, p = 0.513), and sex (U = 16244.5, p = 0.271) did not demonstrate any association with CNS, even in a robust sample (N = 396) representative of a predominantly female academic context (66% women). The findings indicate that, within university populations characterized by high educational homogeneity and access to analogous institutional environments, the presence of a connection with nature may function as a construct that is independent of conventional sociodemographic indicators. This observation prompts inquiries into the moderating influence of educational or cultural factors in environmental perception. The absence of stratification by SES and residence—even in a geographically diverse sample—challenges models that attribute environmental differences to structural inequalities, pointing to the need

to explore psychosocial mediators (e.g., personal values, institutional experiences) in future research.

Discussion

The findings of this study reveal a general absence of association between connectedness with nature (CNS) and key sociodemographic variables—socioeconomic status (SES), age, sex, and place of residence—in a sample of psychology undergraduates. These results contrast with previous research highlighting the role of SES and geographic setting in shaping environmental experiences. For instance, studies have demonstrated that access to urban green spaces is socioeconomically stratified, favoring higher SES groups (Dai, 2011; Hoffimann et al., 2017; Li & Liu, 2016). However, the present study's findings reveal a novel observation. Specifically, the homogeneity in institutional access to natural environments (e.g., university parks, extracurricular activities) within the present sample potentially neutralizes structural disparities, thereby generating uniform perceptions of CNS across socioeconomic strata.

The absence of disparities between urban and rural residents contradicts studies such as that of Belanche et al. (2021), which establish a correlation between rurality and a stronger emotional connection with the environment. However, these findings are consistent with research that challenges the urban-rural dichotomy, as there are no differences in environmental awareness or care (Soini et al., 2012). Cities like Cuenca, with its integrated green infrastructure (e.g., linear parks, ecological corridors), appear to be eroding the traditional boundaries between urban and rural environments, facilitating more equitable interactions with nature (Bell, 1992).

With respect to gender, the absence of observed differences challenges the findings reported by Triantafyllidis & Darvin (2021) and Pérez-Ramírez et al. (2021). These studies reported a greater connection with nature among women; however, the university context has not been specifically studied. However, in university populations, factors such as academic socialization—which emphasizes environmental values independent of gender—could potentially mitigate these differences. This phenomenon is exemplified by the study conducted by Di Fabio & Rosen (2019) in Italy, which examined university students and found no significant differences in their connection with nature based on their sex.

The absence of a correlation between age and CNS may be attributable to the variability in the association between these two variables across the stages of life. According to the findings, this connectivity undergoes a decline during middle and late adolescence, followed by an increase in early adulthood (Yang et al., 2023). Consequently, the limited age range of the present research, coupled with the transitional nature of this stage—where academic factors predominate over environmental experiences—could account for the absence of variation. It is also noteworthy that the extant literature contains findings that are both consistent with and inconsistent with the hypothesized positive association between age and CNS. Specifically, there is evidence that individuals who are older have a greater connection with nature (Carney & Patrick, 2019), but there is also evidence that pro-environmental behavior has been inversely associated with age (Krettenauer et al., 2020).

These findings call into question the universality of classic models linking connectedness to nature to sociodemographic markers. The results suggest that, in homogeneous institutional contexts, academic training and exposure to shared environments act as key moderating factors. This raises the need to reformulate environmental theories to incorporate psychoeducational variables (e.g., ecologically focused curricula, extracurricular activities in nature). From a pragmatic standpoint, these results lend support to university initiatives that aim to cultivate connectedness to nature through structured programs, irrespective of the sociodemographic profile of the student body.

Conclusions

The results of this study contradict long-standing assumptions in the environmental literature by demonstrating that the connection of university students to nature is not influenced by traditional sociodemographic variables, such as socioeconomic status (SES), age, sex, and place of residence. Contrary to prior research linking structural inequalities with disparities in environmental experiences (Hoffimann et al., 2017; Li & Liu, 2016), this sample exhibited no substantial stratification in CNS, despite notable geographic and socioeconomic diversity. This finding suggests that homogeneous academic environments could act as psycho-environmental equalizers, neutralizing external disparities through

institutional policies, shared access to green spaces, and socialization in ecological values (Di Fabio & Rosen, 2019).

The absence of differences between urban and rural contexts highlights the importance of re-evaluating geographic dichotomies in cities with integrated green infrastructure, such as Cuenca. These results challenge the prevailing models that automatically associate rurality with greater natural connection (Belanche et al., 2021). Instead, the quality and accessibility of urban green environments—rather than their mere classification—are critical determinants of CNS (Soini et al., 2012).

In addition, the homogeneity of CNS between sexes is at odds with studies that report a greater environmental connection in women (Triantafyllidis & Darvin, 2021), but it does align with the hypothesis that academic training in egalitarian contexts can weaken traditional gender roles (Soltanpanah et al., 2018). This underscores the potential of universities as spaces that can transform socio-environmental norms, capable of fostering cohesive ecological perceptions.

The cross-sectional design and the narrow age range preclude the generalizability of the findings over time; nevertheless, they furnish valuable evidence on the resilience of CNS to structural variables in educational populations. This suggests that, in educational contexts with integrated environmental policies, CNS can develop equitably, transcending structural barriers that often influence other dimensions of well-being. Future research should explore underlying psychosocial mechanisms (e.g., environmental identity, intrinsic values) that could explain this homogeneity. Furthermore, replicating the study in disciplines with greater sociodemographic diversity (e.g., engineering, natural sciences) would allow us to determine whether these findings reflect a universal phenomenon in academic environments or are limited to specific contexts.

Moreover, this research contributes to theoretical debates on the universality of CNS and offers a practical framework for educational institutions committed to sustainability. By acknowledging the homogenizing influence of university campuses, the opportunity arises for structured interventions that facilitate engagement with nature as a universal right, irrespective of one's origin or identity.

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Declaration of conflicting interests

The authors declare no conflicting interests.

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