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Geographic and Population Dynamics of Adolescent Self-Esteem, Environmentalist Identity, and Life Satisfaction (A GIS-Based Analysis)

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ABSTRACT

Background: Self-esteem among teenagers is a significant intermediary variable in the link between life happiness and environmentalist identity. An environmentalist identity positively correlates with life happiness, and this link is largely mediated by self-esteem. Therefore, enhancing their sense of worth may help adolescents feel more connected to their surroundings and more content with their lives.

Aim: To comprehend the intricate interaction between these factors. However, additional study is required to identify the most efficient strategies for fostering adolescents' environmentalist identity and life happiness.

Method: A quantitative cross-sectional research design was used with the purposive non-probability sampling techniques among 3357 adolescents. The data were collected through self-report questionnaires.

Results: Self-esteem significantly mediates the relationship of satisfaction with life and environmentalist identity (p=0.00). The impact of satisfaction with life on environmentalist identity (p=0.00) and pro-environmental behavior (p=0.00) is significant and very like the impact of self-esteem on environmentalist identity (p=0.00) and pro-environmental behavior (p=0.00).

Conclusion: Self-esteem strongly and significantly mediates the relationship between satisfaction with life and environmentalist identity among adolescents. The higher the self-esteem, the stronger the satisfaction with life and environmentalist identity. In contrast, the dark side of self-esteem influences dissatisfaction with life and an unstable environmentalist identity.

Keywords: Population geography, behavioral geography, Assiut, Egypt, environmentalist identity, self-esteem, life satisfaction, adolescents.

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Introduction

Background

The well-being of adolescents is a cornerstone for the development and sustainability of any society, as this stage of life is critical for shaping future identities, behaviors, and aspirations. In Egypt, the interplay between geographic context and population dynamics significantly influences adolescents' self-esteem, environmental awareness, and overall life satisfaction. Understanding these dynamics is particularly important in the face of rapid urbanization, environmental challenges, and socio-economic changes that impact young individuals differently across regions. By exploring these interconnected themes, this study seeks to shed light on how spatial and demographic factors contribute to the psychosocial development of adolescents, offering insights that can guide policies aimed at fostering healthier and more resilient communities.

Adolescence represents a critical phase in human development, marked by identity formation, psychological growth, and increased environmental and societal engagement. For Egyptian adolescents, this phase is influenced by unique geographic and socioeconomic challenges, including disparities in educational access, environmental awareness, and self-perception. These factors collectively shape essential constructs such as self-esteem, environmentalist identity, and life satisfaction. Among these, self-esteem plays a pivotal role as it influences both life satisfaction and the development of an environmentalist identity, critical for fostering sustainable behavior and resilience.

The study of population geography provides a crucial framework for understanding the spatial dynamics of human behavior, identity, and well-being. Adolescents, as a significant demographic group, are shaped by their geographic and social contexts, which influence their self-esteem, environmental awareness, and overall life satisfaction. Population geography examines how these factors intersect with spatial distribution, access to resources, and environmental conditions, revealing patterns of inequality and social challenges. In the Egyptian context, rapid urbanization, environmental degradation, and demographic shifts underscore the importance of exploring how adolescents develop their environmental identities and personal well-being in different geographic settings. By integrating GIS-based analysis, this research bridges geography, psychology, and environmental studies to provide a nuanced understanding of these interconnected dynamics (Gregory et al., 2009; Johnston et al., 2015).

Geographic Information Systems (GIS) offer a powerful framework to analyze and visualize the spatial dimensions of adolescent health and psychosocial outcomes. By mapping spatial relationships between health outcomes and environmental factors, GIS can uncover patterns in health data, assess community resources, and inform targeted interventions to enhance adolescent well-being. For instance, GIS facilitates the identification of community-level assets that support youth mental health by visualizing local resources beyond traditional census data, helping stakeholders

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understand how neighborhood characteristics impact adolescent health outcomes (Szoko et al., 2024). Additionally, spatial analysis enabled by GIS can uncover correlations between environmental risk factors and adolescent health trends, such as geographic disparities in disease prevalence and health access (Kwan, 2014). Interactive data visualization further enhances this analysis, allowing users to dynamically explore complex health trends, including the influence of socio-economic factors on mental health (Zhu, 2016).

Humankind's rising needs and demands on the earth have negative consequences for our planet and the environment. Pollution increases with mobilization, industrialization, and modernization (Zhao, 2023), and has led to critical thinking about the survival of the Earth, Mother Nature, and the Earth's inhabitants (Van Doeselaar & Reitz, 2023). To preserve and support Mother Nature, people are thinking differently about the conflict between modernization, urbanization, industrialization, and mobilization in the various parts of the earth that are destroying Mother Nature (Coffey & Warren, 2020).

Conservation requires that environmental damage and protection be studied from the perspective of the environment (Huffman et al., 2020). There is no single "environmentalist identity" since environmentalism is a large and varied movement (Taşdemir, 2020), however, many values and ideas frequently connected to environmentalism can facilitate a shared sense of identity among environmentalists (Reitz et al., 2022). The fundamental principles and convictions frequently linked to environmentalism that support an ecological identity include belief, sustainability, interconnectedness, environmental justice, and the will to act on behalf of the environment (Kupcewicz et al., 2020). In this context, belief refers to nature's intrinsic worth regardless of its economic or utilitarian usefulness to people; environmentalists believe that nature has intrinsic worth that should be safeguarded (Olsen et al., 2022). Sustainability identifies use of natural resources to satisfy current demands without endangering the ability of future generations to satiate their own needs (Freire & Ferreira, 2020). An emphasis on ecological interconnectedness highlights the intricate web of connections between various species and ecosystems, as well as how human actions may significantly influence the environment (Asgeirsdottir & Sigfusdottir, 2021). Environmentalists strongly emphasize social and environmental justice because they think everyone has a right to a healthy environment and that communities of color are disproportionately affected by environmental deterioration (Butkovic et al., 2020). Finally, environmentalists are prepared to act to safeguard the environment and advance sustainability (Kim & Nho, 2020). Even though not all environmentalists share these values and opinions, they provide many of them with a sense of shared identity and motivation (Hlaďo et al., 2022).

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People who consider themselves environmentalists carry out environmental actions and display environmental behaviors frequently experience higher levels of happiness and life satisfaction than people who do not prioritize environmental issues (Reitz et al., 2022). This is one reason for the link between environmentalism and individual feelings of purpose and meaning in life (Granjo et al., 2021). Environmental activism and behaviors may empower and gratify people by giving them a sense of agency and influence regarding the environment (Granjo et al., 2021). Additionally, environmentalism frequently involves social interaction and community involvement, which can enhance overall life satisfaction (Yan et al., 2022).

The environmental revolution can benefit one's physical and emotional health. According to studies, being among nature and in green areas may be good for one's mental health (Marcionetti & Rossier, 2021), and environmental choices like cycling or walking instead of driving can promote physical activity and improve one's health (Yüksel Doğan & Metin, 2023).

Environmentalism can be a significant part of one's identity and help with overall well-being and life satisfaction (Szcześniak et al., 2021), a person's subjective contentment with their life. Life satisfaction differs from person to person and is affected by individual circumstances, attitudes, and beliefs (Guasp Coll et al., 2020). According to research, higher levels of life satisfaction are linked to favorable outcomes like being happier, and having longer lifespans and better physical and mental health (Chu & Koo, 2023). Social support, fulfilling relationships, financial stability, and a feeling of purpose or meaning in life are all factors linked to greater levels of life satisfaction (Bum et al., 2021). Despite it being a nuanced idea, life satisfaction is understood to be a crucial component of overall well-being and quality of life (Swaidan, 2021).

Life satisfaction is embodied in a person's self-concept and self-worth (Heemstra, 2020), whereas self-esteem is a person's general perception of their value and self-respect. According to (Wang & Kong, 2020), self-esteem and life satisfaction are positively correlated. Those with higher levels of self-esteem frequently report higher levels of life satisfaction than those with lower levels of self-esteem. This could be the case because people with high self-esteem tend to be happier and more confident in dealing with difficulties and conquering barriers (Nguyen & Cheng, 2022).

While there is a connection between life satisfaction and self-esteem, it is vital to remember that they are separate and subject to various influences (Szcześniak & Timoszyk-Tomczak, 2020). For instance, when a person goes through challenging life circumstances or lacks a sense of purpose or meaning, they may have high self-esteem yet still experience less life satisfaction (Zapata, 2022). Similarly, if a person has healthy connections and a strong feeling of fulfillment, they may report high levels of life satisfaction while having poor self-esteem (Russ et al., 2021).

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According to (Szcześniak et al., 2022), self-esteem, life happiness, and environmentalist identity are positively correlated. Compared to individuals who place less importance on environmental issues, those who identify as environmentalists and take environmental actions, frequently report better life satisfaction and self-esteem. Environmental activism and behaviors can help people feel better about themselves and increase their self-esteem (Coffey & Warren, 2020). Additionally, environmentalism frequently involves social interaction and community involvement, both of which can enhance overall life satisfaction and self-esteem. Individuals may have a sense of belonging and social support by interacting with people who share their beliefs and interests, which in turn, improves well-being Asgeirsdottir & Sigfusdottir, 2021).

Even though environmentalism might not suffice for leading a happy and contented life or having high self-esteem, it can be a significant part of one's identity and help with individual well-being and self-esteem. In order to evaluate this relation, this present study was conducted to address the mediating role of self-esteem between the relationship of life satisfaction and environmentalist identity and behavior among adolescents.

Aims and Objectives of the Study:

This study aims to analyze the spatial distribution of self-esteem, environmentalist identity, and life satisfaction among adolescents in Egypt. It employs advanced GIS-based spatial analysis and statistical techniques to explore the direct and indirect relationships between these constructs, emphasizing geographic disparities. By integrating psychological constructs with geographic insights, this research provides valuable implications for policymakers, educators, and public health officials to address inequalities and promote sustainable practices for adolescent well-being across the country.

1. To explore gender-based differences in pro-environmental behavior, environmentalist identity, self-esteem, and life satisfaction among adolescents.

2. To examine the urban-rural disparity in environmentalist identity, pro-environmental behavior, and self-esteem among adolescents in Egypt.

3. To identify the direct and indirect effects of self-esteem and life satisfaction on environmentalist identity and pro-environmental behavior using regression and path analysis.

4. To assess the moderating and mediating roles of environmentalist identity in the relationship between self-esteem and life satisfaction among adolescents.

To understand the geographic distribution of environmentalist identity, pro-environmental behavior, and related psychosocial factors using GIS-based spatial

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analysis

Research Gap and Study Relevance

Adolescent self-esteem, environmentalist identity, and life satisfaction have been extensively studied, yet significant gaps remain in understanding their spatial dynamics, particularly in Egypt. While prior research has explored these constructs individually, few studies have examined them within a spatial framework. This study addresses these gaps by applying GIS-based analysis to uncover geographic and population disparities in psychological well-being among Egyptian adolescents, offering a holistic understanding of these variables and their interactions.

Impact of Environmental Education Programs

Existing literature highlights the transformative role of environmental education programs in fostering ecological awareness and pro-environmental behaviors among adolescents. For instance, programs involving hands-on activities and community projects have been shown to significantly enhance environmental awareness among urban adolescents, leading to a stronger commitment to environmental issues (Zarate et al., 2024). Moreover, training interventions focused on climate change have demonstrated sustained effects on pro-environmental behaviors, persisting well beyond the initial program duration (Rania et al., 2024). However, such programs and their impact on psychological variables like self-esteem remain underexplored in the Egyptian context.

Psychological Factors and Urban Context

Urban adolescents often develop a more robust environmental identity due to their exposure to structured educational frameworks emphasizing ecological consciousness and self-efficacy (Razali et al., 2023; Sierra-Barón et al., 2023). Conversely, while rural adolescents may possess inherent environmental identities due to their lifestyle and direct interaction with nature, they lack access to targeted educational interventions that enhance their understanding and commitment to environmental issues (Sierra-Barón et al., 2023). This divergence between urban and rural settings underscores the importance of spatially analyzing environmentalist identity and pro-environmental behavior to uncover disparities and inform policy.

By integrating these insights, this research not only fills a critical gap in understanding the spatial dynamics of self-esteem, environmentalist identity, and life satisfaction among Egyptian adolescents but also highlights the role of geographic disparities and environmental education in shaping these variables. This work aims to provide actionable insights for policymakers and educators to design targeted interventions that bridge the urban-rural divide and promote sustainable development

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practices among youth.

- **Literature Review**

Adolescent Development and Environmental Identity

spatial and demographic variables, a focus central to population geography. The discipline explores the interaction between population distribution, socio-environmental contexts, and individual well-being, emphasizing how geographic conditions shape identity formation and personal growth. Previous studies in population geography have highlighted the impact of urbanization, migration, and environmental factors on the psychosocial development of adolescents (Knox & Marston, 2016). For instance, environmentalist identity is often associated with proximity to green spaces and exposure to environmental education, while self-esteem is linked to socio-economic conditions and access to opportunities (Weeks, 2020). These themes align with geographic theories that emphasize the importance of place in shaping human behavior and development, providing a solid foundation for this research.

Adolescence represents a critical stage in identity formation, during which environmental experiences and social interactions significantly shape the development of an environmentalist identity. Direct interaction with degraded environments, such as those impacted by climate change, fosters a deeper connection to nature and enhances adolescents' awareness of environmental challenges (Young et al., 2020). Engaging in community-driven environmental projects allows youth to appreciate the interdependence between their communities and the environment, promoting a sense of responsibility and stewardship (Gallay et al., 2021).

Social interactions further play a pivotal role in identity development. Adolescents often derive meaning and motivation from peer groups and individuals directly affected by environmental issues, leading to active engagement and recognition of ecological concerns (Stapleton, 2015). Exposure to diverse perspectives broadens their understanding of environmental issues, facilitating the formation of a multifaceted environmental identity (Stapleton, 2015).

Additionally, resilience emerges as a key component of identity formation in the face of environmental degradation. Adolescents negotiate their identities through challenges posed by degraded ecosystems, aligning their sense of self with community values and fostering resilience (Chen et al., 2012). This dynamic process underscores the interplay between personal experiences, social factors, and environmental contexts in shaping adolescent environmentalist identity.

Environmental Identity in Rural vs. Urban Contexts

The development of environmental identity among adolescents varies significantly between rural and urban areas, shaped by distinct environmental experiences and

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community dynamics. Studies have shown that rural residents tend to exhibit higher levels of environmental identity, closely linked to greater pro-environmental behaviors (Sierra-Barón et al., 2023). This is often attributed to their direct interaction with natural environments and the affective and evaluative dimensions of place identity, which are more pronounced in rural communities, fostering a deeper emotional connection to their local surroundings (Belanche et al., 2021).

In contrast, urban populations, despite having lower overall environmental identity, demonstrate that psychological health and connectedness with nature play stronger roles in predicting pro-environmental behaviors (Sierra-Barón et al., 2023). Urban adolescents often build their environmental identity through structured experiences and engagement in nature-focused activities, which enhance their connection to nature and promote conservation behaviors (Keith et al., 2022). Furthermore, community engagement initiatives, such as participation in local environmental projects, have been shown to instill a sense of agency and environmental identity among urban youth, emphasizing the importance of active participation in fostering identity formation (Gallay et al., 2021).

While rural environments naturally support the development of environmental identities through daily interactions with nature, urban settings offer unique opportunities for identity building through structured interventions and educational programs. These findings highlight the need for tailored environmental initiatives that address the distinct dynamics of both rural and urban contexts.

Previous studies that examined psychological and geographic factors in shaping adolescent behaviors.

Previous studies have emphasized the intricate interplay between psychological and geographic factors in shaping adolescent behaviors, influencing outcomes such as substance use, physical activity, and overall well-being, with notable differences between urban and rural settings. Self-esteem plays a pivotal role in fostering resilience among adolescents, reducing their susceptibility to risky behaviors such as substance use, as higher self-esteem is linked to a greater ability to resist peer pressure and make healthier choices (García, 2024). Peer influence is equally significant, with urban adolescents often facing heightened pressure related to behaviors like alcohol consumption and early sexual activity compared to their rural counterparts (Syam & Mulyono, 2023). Additionally, urban adolescents are more likely to engage in risky behaviors due to their exposure to diverse peer groups and broader lifestyle influences (Syam & Mulyono, 2023). In contrast, rural adolescents benefit from stronger community ties, which encourage positive behaviors and foster a sense of belonging (Klos et al., 2024). Environmental perceptions also play a significant role in these differences. For instance, urban adolescents often perceive their environments as better suited for recreational activities, while rural adolescents report feeling safer in

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their neighborhoods, which supports their overall well-being. Positive youth development mediates the relationship between physical activity and health-related quality of life in adolescents from urban and rural settings, highlighting the impact of these environmental differences (Klos et al., 2024).

The Role of Life Satisfaction in Behavioral Outcomes

Life satisfaction plays a crucial role as a predictor of behavioral outcomes, particularly in the context of substance use disorders. Research consistently demonstrates that higher life satisfaction is associated with reduced substance use and enhanced treatment outcomes, underlining its protective and therapeutic significance.

Life Satisfaction and Substance Use Life satisfaction serves as a protective factor, with adolescents reporting higher levels of satisfaction engaging less frequently in risky behaviors, including substance use (Hanniball et al., 2021). Longitudinal evidence highlights a synchronous relationship between substance use and life satisfaction, where a decrease in substance use is paralleled by an increase in life satisfaction, offering valuable insights for developing effective treatment strategies (Moe et al., 2024). Moreover, findings from a randomized controlled trial revealed that life satisfaction significantly predicts symptom reduction in disorders such as internet addiction, underscoring its broader relevance in therapeutic contexts (Müller et al., 2023).

Implications for Treatment
Incorporating life satisfaction into treatment plans for substance use disorders can enhance retention rates, as greater satisfaction with treatment has been linked to lower dropout rates (Bourion-Bédès et al., 2020). Furthermore, addressing life satisfaction as part of psychosocial interventions can stabilize treatment effects and reduce the likelihood of relapse, emphasizing the need for comprehensive approaches that prioritize psychosocial well-being (Müller et al., 2023).

While life satisfaction is a significant predictor of positive behavioral outcomes, it is crucial to account for other influencing factors, such as psychological distress and social support, to develop a holistic understanding of recovery dynamics. Integrating these elements into treatment plans can maximize the potential for sustainable recovery and improved quality of life.

Geographic and Spatial Analysis in Adolescent Studies

Geographic and spatial analysis plays a pivotal role in understanding various health outcomes and behaviors among adolescents, offering insights into patterns influenced by environmental, social, and demographic factors. For instance, geographic and demographic variables significantly shape adolescent suicide rates, with higher rates

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observed in rural areas, among males, and in socio-economically disadvantaged populations. These findings underscore the importance of spatial considerations in designing effective suicide prevention strategies (Ghadipasha et al., 2024). Despite its potential, geospatial techniques have been underutilized in studying violence against children. A systematic review revealed a reliance on administrative data, which often underrepresents the true prevalence of violence, highlighting the need for robust methodologies and diverse geographic contexts in future studies (Shiode & Devries, 2024). Environmental contexts also play a critical role in shaping adolescent development. The "adolescent neural urbanome" framework emphasizes how social and physical environments influence neural and behavioral outcomes, demonstrating the importance of linking external datasets to examine these impacts (Cardenas-Iniguez et al., 2024). Additionally, the relationship between natural environments and health outcomes varies across geospatial configurations, with socio-economic status and buffer size significantly influencing mental health and physical activity among adolescents (Nigg et al., 2022). Spatial analyses further reveal distinct patterns in adolescents' active transport to school, driven by neighborhood characteristics and socio-demographic factors, underscoring the value of geographic analysis in promoting active transport behaviors (Chen et al., 2021). While geographic and spatial analysis provides invaluable insights into adolescent health and behavior, addressing limitations in current data sources and methodologies is essential. Future research should integrate diverse data types and adopt comprehensive approaches to improve understanding in this field.

Study Design and Population

This study employed a quantitative research design to explore the relationship between self-esteem, environmentalist identity, and life satisfaction among adolescents in Assiut Governorate, Egypt. A total of 3,357 participants were included in the study, representing youth aged 16 to 23 years from various urban and rural areas within the governorate.

Data Collection Tools

A structured questionnaire was developed and distributed among the participants. The questionnaire incorporated the following standardized psychological scales, which were validated and tested for reliability in the study area:

1. Satisfaction with Life Scale (SWLS): Used to measure the participants' general life satisfaction.
2. Pro-environmental Behavior Scale: Assessed the frequency and type of pro-environmental actions undertaken by the respondents.
3. The Six-Item State Self-Esteem Scale (SSES-6): Measured participants’ self-perceptions across different dimensions of self-esteem.

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4. Environmentalist Identity Scale: Evaluated the degree to which adolescents identified with and prioritized environmental concerns.

Data Analysis

The collected data were analyzed using **SPSS (Version 21)** for statistical analyses, including descriptive statistics, regression, and path analysis to assess direct and indirect relationships between the variables. Additionally, **AMOS Version 21** was utilized for structural equation modeling (SEM) to further examine the complex relationships among the constructs under study.

For geospatial analysis, **ArcMap version 10.8** and **ArcGIS Pro** were employed to conduct advanced spatial analyses and visualize the geographic distribution of psychological constructs and behaviors across urban and rural areas in Assiut. The integration of GIS tools enabled the creation of detailed spatial maps, highlighting disparities and patterns in self-esteem, environmentalist identity, and life satisfaction across the study area. This combined approach of statistical and geospatial analysis provided a comprehensive understanding of the data, bridging the gap between psychological and geographic perspectives.

Methodology

Research design

A quantitative, cross-sectional research design was used.

Sample and sampling technique

The sample size comprised **3,357 participants**, including males and females aged **16-23 years**, residing in all centers of Assiut Governorate. A **snowball sampling technique** was employed to recruit participants, ensuring a diverse and representative sample across urban and rural areas. This non-probability sampling method was chosen to facilitate access to hard-to-reach populations and to ensure adequate representation of the target demographic.

The sample size was determined using the **Raosoft Sample Size Calculator**, which ensured statistical reliability and precision in the study's findings. The raw data collected during the study are available upon request from the researcher for verification or further analysis, in compliance with ethical standards and transparency in research practices.

Inclusion/Exclusion criteria

Being literate in English was required for an easy understanding of the concepts. Adolescents who were illiterate and had not attended school in their life were

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excluded.

Instruments

Demographic sheet

Participant sociodemographic variables were assessed using a demographic sheet to evaluate the age, gender, level of education, family structure, socio-economic condition, and number of peers.

Satisfaction with life questionnaire

The Satisfaction with Life Scale (SWLS) is a popular self-report survey used to gauge a person's general level of life satisfaction. The scale consists of five components to measure a person's level of happiness with relationships, accomplishments, and their prevailing life circumstances. A seven-point Likert scale (1=strongly agree, 2=agree, 3=slightly agree, 4=neither agree nor disagree, 5=slightly disagree, 6=disagree, and 7=strongly agree), was used to score the items. Cut-off scores indicate that 5–9=extremely dissatisfied, 10–14=dissatisfied, 15–19=slightly dissatisfied, 20=normal, 21–25=slightly satisfied, 26–30=satisfied, and 31–35=extremely satisfied. The values indicating internal consistency were 0.79 and 0.86 (Alfonso et al., 1996; Dirzyte et al., 2021).

Self-esteem questionnaire

A popular self-report questionnaire, the Rosenberg Self-Esteem Scale, was used to assess self-esteem. The scale has ten components that measure a person's overall feeling of value and esteem. It has a four-point Likert scale (1=strongly agree, 2=agree, 3=disagree, and 4=strongly disagree). Reverse scoring was used for items 2, 5, 6, 8, and 9, where 1=strongly disagree, 2=disagree, 3=agree, and 4=strongly agree. The total result comes from all ten items and higher scores correspond to greater self-esteem. It has a strong internal consistency at 0.87 and 0.88 (Beck et al., 2001; Swami et al., 2022).

Environmentalist identity questionnaire

The Environmental Identity Scale (EIS) is a self-report questionnaire used to assess a person's commitment to and identification with environmental concerns. The scale has twelve components to gauge a person's connection to nature, environmental awareness, and pro-environmental behavior. A six-point Likert scale (1=strongly disagree, 2=disagree, 3=somewhat disagree, 4=somewhat agree, 5=agree, and 6=strongly agree) was used to score the items. It has a solid internal consistency of 0.77 and 0.84 (Olivos & Aragonés, 2011; Curtin & Jia, 2022).

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Procedure

A multi-stepped approach was used to acquire the data for this study. The first stage was to select the appropriate individuals, and the second was to use descriptive statistics to analyze the data. Descriptive statistics were used to describe responses to each question in a dataset and establish general trends and the measures of dispersion. The survey questionnaires used in this study to find factors were related to self-esteem, life satisfaction, demographics, and environmentalist identification. As part of the survey process, the respondents' interpersonal interactions and primary goal-directed behaviors were evaluated to better understand their experiences. The data acquired using this methodology clarified what influenced people's relationships with nature, environmental consciousness, and pro-environmental behavior. Common subjects were categorized and placed on a map to help the evaluation. The procedure was spread out over 20 days to give each participant a chance to complete the survey.

Results

Sample Characteristics

Gender: The sample consisted of 580 males (17.3%) and 2,777 females (82.7%), indicating a significant female majority.

Residence: Participants were drawn from both urban and rural areas, with 1,035 individuals (30.8%) residing in cities and 2,322 individuals (69.2%) from villages, highlighting a rural majority in the sample.

Age: The age distribution of participants included 306 individuals (9.1%) aged 16–17 years, 2,062 individuals (61.4%) aged 18–19 years, 708 individuals (21.1%) aged 20–21 years, and 281 individuals (8.4%) aged 22–23 years. The majority of the participants were within the 18–19-year age group.

Table (1) Demographic variables (n=3357)

Variables		Frequency	Percent
Gender	males	580	17.3 %
	Females	2777	82.7%
	Total	**3357**	**100.0**
Residence	city	1035	30.8%
	village	2322	69.2%
	Total	**3357**	**100.0**
Age	16- 17 years	306	9.1%
	18- 19 years	2062	61.4%
	20-21 years	708	21.1%
	22-23 years	281	8.4%
	Total	**3357**	**100.0**
Province name	Dayrout	478	14.2%

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	Assiut	571	17.2%
	Manfalout	213	6.3%
	Abu Tij	363	10.8%
	Sedfa	211	6.3%
	Abanoub	259	7.7%
	El Fath	250	7.4%
	Sahel Seleem	146	4.3%
	Alquseyah	284	8.5%
	El Badary	269	8.0%
	El- Ghanayem	114	3.4%
	Assiut city	199	5.9%
	Total	**3357**	**100.0**
Occupation	Full-time student and works part-time in addition to studying	2898	86.3%
	Full-time student	145	4.3%
	A recent graduated and unemployed	314	9.4%
	Total	**3357**	**100.0**
Marital Status	Single	3116	92.8%
	Married	241	7.2%
	Total	**3357**	**100.0**

Table 1 indicates that the average participant was female (f=1950, %=82.1) aged 20–21 (f=1328, %=55.9), who lived in a village (f=1607, %=67.7), had middle socio-economic status (f=200, %=50.1), and most probably a student (f=1948, %=82.1).

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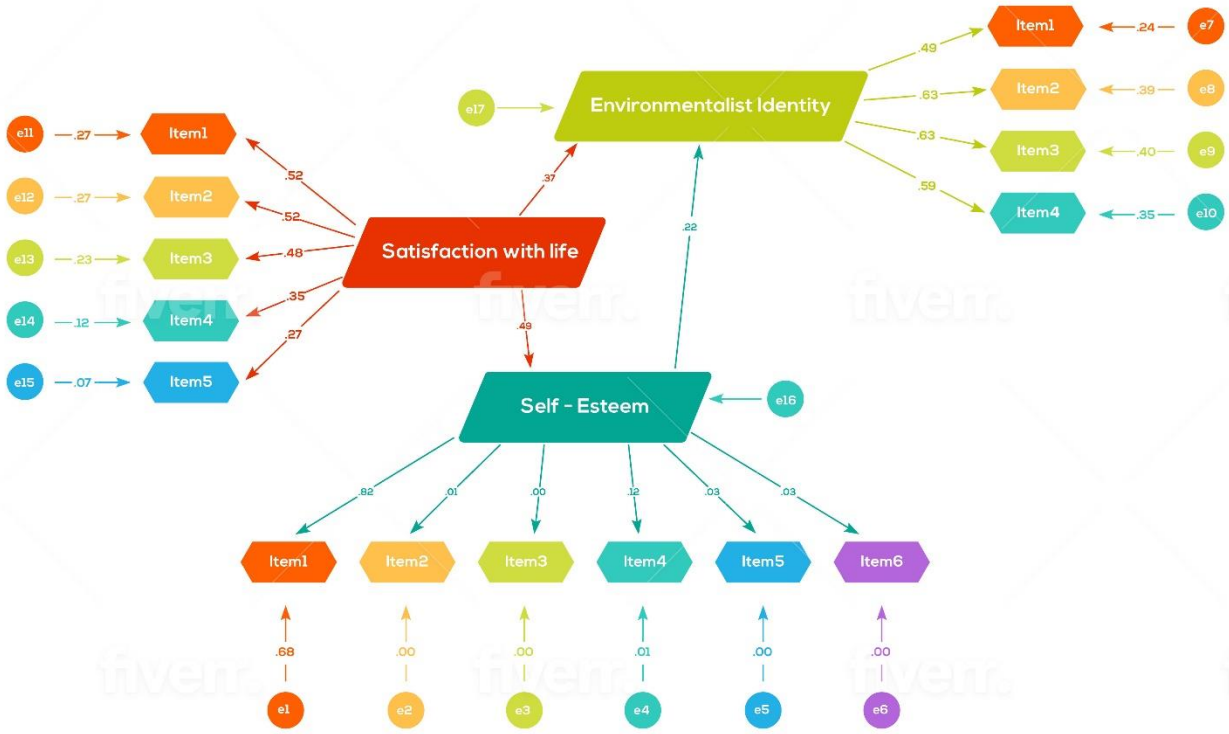

Figure (1) Self-esteem: an intermediate variable for the relationship between Satisfaction with Life and Environmentalist Identity (n=2374).

Figure 1 shows the direct and indirect effects between self-esteem, satisfaction with life, and environmentalist identity. It also shows that the indicators of the proposed model are good for data: CMIN=134.98, DF=88, P=0.001, AGFI=0.93, NFI=0.92, GFI=0.91, RMR=0.07, CFI=0.92, RMSEA=0.07.

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Table 2 Path Analysis Results for Relationships Between Self-Esteem, Environmentalist Identity, and Life Satisfaction

	Path	Type of effect	Std. Est.	Unstd. Est.	P
Satisfaction with life	Self-Esteem	Direct	0.49	0.84	0.001
Self-Esteem	Environmentalist Identity	Direct	0.22	0.12	0.001
Satisfaction with life	Environmentalist Identity	Direct	0.37	0.33	0.001
		Indirect	0.11	0.10	0.01
Satisfaction with life	Environmentalist Identity Item 1	Indirect	0.23	0.43	0.001
Satisfaction with life	Environmentalist Identity Item 2	Indirect	0.30	0.62	0.001
Satisfaction with life	Environmentalist Identity Item 3	Indirect	0.30	0.56	0.001
Satisfaction with life	Environmentalist Identity Item 4	Indirect	0.28	0.57	0.001
Satisfaction with life	Self-Esteem Item 1	Indirect	0.40	0.84	0.001
Satisfaction with life	Self-Esteem Item 2	Indirect	0.003	0.005	0.86
Satisfaction with life	Self-Esteem Item 3	Indirect	0.002	0.004	0.94
Satisfaction with life	Self-Esteem Item 4	Indirect	0.06	0.11	0.01
Satisfaction with life	Self-Esteem Item 5	Indirect	0.01	0.03	0.37
Satisfaction with life	Self-Esteem Item 6	Indirect	0.02	0.03	0.36
Self-Esteem	Environmentalist Identity Item1	Indirect	0.11	0.12	0.01
Self-Esteem	Environmentalist Identity Item 2	Indirect	0.14	0.17	0.01
Self-Esteem	Environmentalist Identity Item 3	Indirect	0.14	0.16	0.01
Self-Esteem	Environmentalist Identity Item 4	Indirect	0.13	0.16	0.01

The values of the regression coefficients between satisfaction with life, self-esteem, and environmentalist identity were 0.49 and 0.22, respectively, which are statistically significant at a significance level of 0.001. There is a positive direct effect between satisfaction with life and environmentalist identity, where the value of the regression coefficients was 0.37, which is statistically significant at a significance level of 0.001. There is also an indirect positive effect between satisfaction with life and environmentalist identity through self-esteem, where the regression coefficient's value was 0.11, which is statistically significant at a significance level of 0.01. Therefore, self-esteem mediates the relationship between satisfaction with life and environmentalist identity. In the current study, the bootstrap method was relied on to identify the type of mediation, which depends on both direct and indirect effects between the independent and dependent variables in the presence of the intermediate variable. It turned out that this is a partial mediation because the value of the direct and indirect effects are statistically significant.

Table 2 also showed that there was a positive indirect effect between satisfaction with life and the environmentalist identity, as all the values of the regression coefficients were statistically significant at a significance level of 0.001. There was a positive indirect effect between satisfaction with life and self-esteem's first and fourth

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elements, where all the values of the regression coefficients were statistically significant at significance levels of 0.001 and 0.01, respectively. At the same time, there was no indirect effect between satisfaction with life and self-esteem's second, third, fifth, and sixth elements, where none of the regression coefficients' values were statistically significant. However, there was a positive indirect effect between self-esteem and the aspects of the environmentalist identity, where all the values of the regression coefficients were statistically significant at a significance level of 0.01.

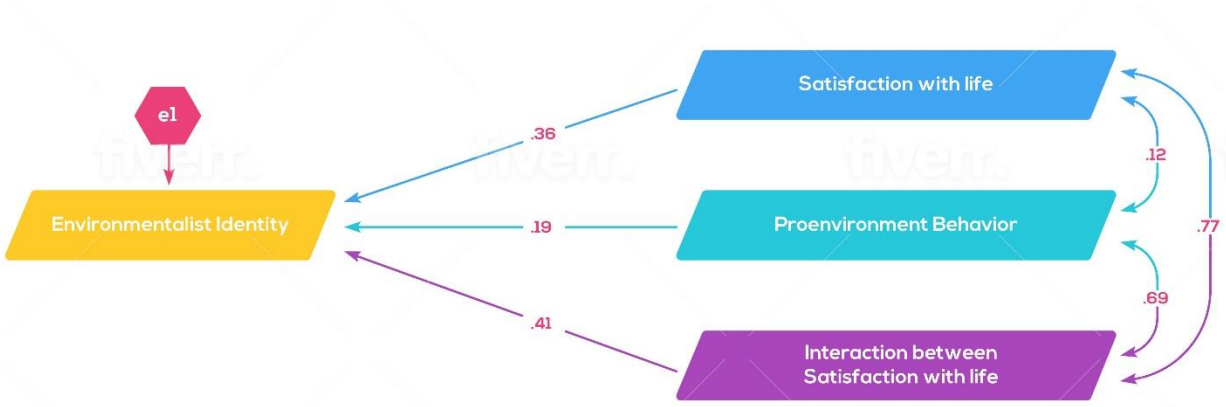

Figure 2 : Self-esteem: a modified variable for the relationship between life satisfaction and environmentalist identity. (n=2374)

It is clear from Figure 2 that the modified variable (self-esteem) has affected the relationship between the independent variable (life satisfaction) and the dependent variable (environmentalist identity) in adolescents. Table 3 shows the standard and non-standard regression coefficients and their statistical significance.

Table 3: Effect of modified variable (n=2374)

Path		Standardized Estimates	Unstandardized Estimates	SE	CR	P
Satisfaction with Life	Environmentalist Identity	0.36	0.35	0.05	7.11	0.001
Self-Esteem	Environmentalist Identity	0.19	0.17	0.04	4.25	0.001
Interaction between Satisfaction with Life and Self-Esteem	Environmentalist Identity	0.41	0.51	0.04	12.75	0.001

Note: SE=Standard error; CR=Critical ratio

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It is clear from Table 3 that there is a statistically significant effect of the modified variable (self-esteem) on the relationship between satisfaction with life and environmentalist identity in adolescents, where the value of the non-standard regression coefficient (beta) for the interaction between satisfaction with life and self-esteem on aggression is 0.51, which is positively and statistically significant at a significance level of 0.001. It indicates that the modified variable (self-esteem) forces satisfaction with life on environmentalist identity, i.e., the high level of self-esteem positively affects the environmentalist identity. In other words, adolescents with high self-esteem scores show high scores for satisfaction with life, and this is associated with high degrees of environmentalist identity. On the other hand, adolescents with a low level of self-esteem may show low scores in satisfaction with life, which is associated with low degrees of environmentalist identity. This represents a partial modification of this hypothesis because the direct effect between satisfaction with life as an independent variable and environmentalist identity as a dependent variable is still statistically significant after entering the modified variable (self-esteem) in the model. In this case, the value of the regression coefficient non-normative (beta) of satisfaction with life on the environmentalist identity, 0.35, is statistically significant at a significance level of 0.001.

Table 4: shows a strong positive correlation between satisfaction with life and pro-environmental behavior.

Variables	Satisfaction with Life	Pro-Environment Behavior
Satisfaction with Life	1	
Pro-Environment Behavior	0.225 **	1

Table 5: Self-esteem and satisfaction in life: predictors of environmentalist identity and pro-environmental behavior. (n=2374)

Dependent Variable	Independent Variable	R	R Square	Value "F"	Unstandardized Coefficients	Value "T"	Constant
Self-Esteem	Pro-Environmental Behavior	0.200	0.040	99.17***	0.088	9.95***	22.39
Self-Esteem	Pro-Environmental Behavior	0.219	0.048	59.55***	0.077	8.35***	20.63
	Environmentalist Identity				0.102	4.38***	
Satisfaction with Life	Environmentalist Identity	0.281	0.079	203.83***	0.284	14.28***	11.09
Satisfaction with Life	Environmentalist Identity	0.320	0.102	134.82***	0.239	11.66***	15.21

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Dependent Variable	Independent Variable	R	R Square	Value "F"	Unstandardized Coefficients	Value "T"	Constant
	Pro-Environmental Behavior				0.063	7.79***	

***Function at the level of 0.001

It is clear from Table 5 that self-esteem can be predicted through pro-environmental behavior and environmentalist identity. The values of q and t were statistically significant at a significance level of 0.001 in all steps of the gradual regression analysis, indicating the significance of the effect of the independent variables on the dependent variable. Independent variables contributed 22% to the variation in the degree of self-esteem. Pro-environmental behavior was the most influential variable in self-esteem, contributing 20%. The next most impactful variable was environmentalist identity, contributing 2% to self-esteem. A predictive equation can be formulated as follows: self-esteem=20.63+0.077×degree of pro-environmental behavior+0.102×degree of environmentalist identity.

Table 5 also shows that life satisfaction can be predicted through pro-environmental behavior and environmentalist identity, where the values of q and t were statistically significant at the significance level of 0.001 in all steps of the gradual regression analysis. This indicates the significance of the effect of the independent variables on the dependent variable, as they contributed 32% to the variation in satisfaction with life. Environmentalist identity is the most influential variable in life satisfaction, contributing 28%. It was followed by pro-environmental behavior, which contributed 4% to variation in life satisfaction. A predictive equation can be formulated as follows: Life satisfaction=15.21+0.239×the degree of environmentalist identity+0.063×the degree of pro-environmental behavior.

Spatial Distribution and Geographic Analysis of Key Variables

To further understand the spatial patterns of adolescent self-esteem, environmentalist identity, and life satisfaction, geographic distribution analysis was conducted using GIS-based methodologies. The results are presented in the following maps Figures (1:4) , which highlight regional disparities and trends.

Understanding the spatial distribution of key psychological and behavioral variables—such as Satisfaction with Life, Pro-environment Behavior, Self-Esteem, and Environmentalist Identity—provides valuable insights into regional disparities and the underlying factors influencing adolescent well-being across the governorate. Mapping these variables across administrative centers highlights the geographic variation in individual and community experiences, offering a comprehensive perspective that bridges psychological constructs with environmental and social contexts. Such analysis is crucial for identifying areas requiring targeted interventions, allocating resources effectively, and designing context-specific policies

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to enhance the quality of life and environmental awareness among adolescents.

Table (6) Average Scores of Psychological and Behavioral Variables Across Administrative Centers in Assiut Governorate

Provinces	Variables	Mean	Std. Deviation
Abanoub	Satisfaction with life	14.57	3.48
	Pro-environment Behavior	59.83	8.51
	Self- Esteem	16.94	4.10
	Envirnomentalist Identity	10.06	4.03
Abu Tij	Satisfaction with life	14.27	3.51
	Pro-environment Behavior	58.27	8.96
	Self- Esteem	17.04	4.09
	Environmentalist Identity	10.68	3.65
El Badary	Satisfaction with life	14.45	3.59
	Pro-environment Behavior	59.75	9.16
	Self- Esteem	17.48	5.08
	Envirnomentalist Identity	10.40	3.87
El-Ghanayem	Satisfaction with life	14.67	4.11
	Pro-environment Behavior	55.97	11.02
	Self- Esteem	17.05	4.81
	Envirnomentalist Identity	10.52	4.12
El Fath	Satisfaction with life	14.43	3.45
	Pro-environment Behavior	58.27	8.96
	Self- Esteem	17.40	4.37
	Envirnomentalist Identity	10.98	3.59
Alquseyah	Satisfaction with life	14.18	4.12
	Pro-environment Behavior	57.75	10.10
	Self- Esteem	16.66	3.84
	Envirnomentalist Identity	10.98	3.59
Dayrout	Satisfaction with life	14.13	3.68
	Pro-environment Behavior	59.37	9.03
	Self- Esteem	17.60	4.50
	Envirnomentalist Identity	11.33	3.72
Sahel Seleem	Satisfaction with life	14.02	3.81
	Pro-environment Behavior	58.38	8.42
	Self- Esteem	18.09	4.16
	Envirnomentalist Identity	10.68	3.65
Sedfa	Satisfaction with life	15.36	2.77
	Pro-environment Behavior	57.08	7.52
	Self- Esteem	18.06	4.09
	Envirnomentalist Identity	11.98	3.53
Assiut City	Satisfaction with life	14.30	3.82
	Pro-environment Behavior	55.92	9.53
	Self- Esteem	16.94	4.10
	Envirnomentalist Identity	10.93	4.02
Assiut	Satisfaction with life	13.86	4.08
	Pro-environment Behavior	57.71	10.35
	Self- Esteem	17.52	3.88
	Envirnomentalist Identity	10.64	3.75
Manfalout	Satisfaction with life	13.80	3.71
	Pro-environment Behavior	57.18	9.58
	Self- Esteem	17.21	4.37
	Envirnomentalist Identity	11.06	3.50

The observed disparities between administrative centers highlight the role of local socio-environmental factors in shaping adolescent well-being and environmental

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behaviors. The analysis of satisfaction with life revealed notable geographic disparities. Sedfa (M = 24.6) and El-Badary (M = 23.8) recorded the highest satisfaction levels, which can be attributed to their rural nature, strong social ties, and reliance on agriculture for economic stability. Such environments often foster a greater sense of well-being (Cao et al., 2020; Knight et al., 2016). In contrast, Assiut City (M = 19.8), as an urban hub, faces challenges like population density, limited green spaces, and economic pressures, contributing to lower life satisfaction scores. These findings are consistent with broader research on urban-rural differences in life satisfaction (Knight et al., 2016). These geographic patterns are further illustrated in the IDW map (Figure 2), which highlights the concentration of higher satisfaction levels in rural districts like Sedfa and El-Badary, and lower levels in the urban core of Assiut City.

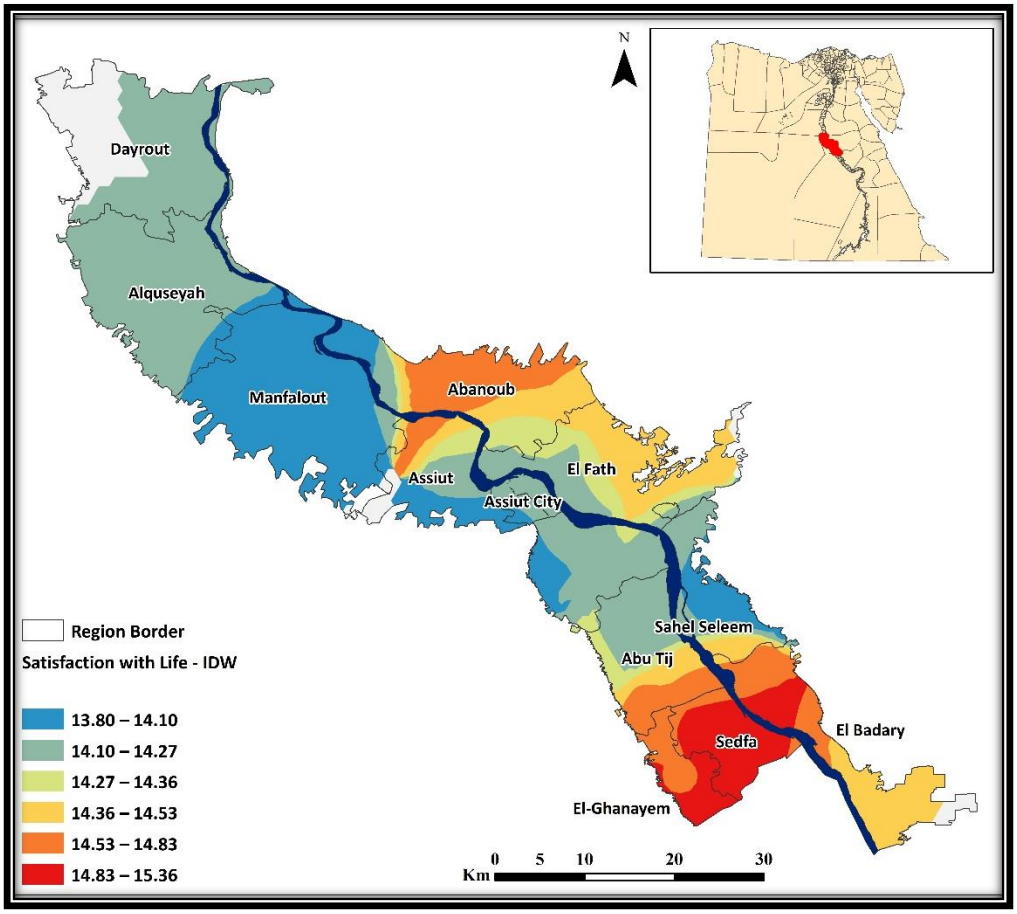

Figure (1) Spatial Distribution of Pro-environment Behavior in Assiut Governorate (Kriging Method)

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Pro-environment behavior shows notable geographic disparities, with Sedfa (M = 59.8) and El-Badary (M = 57.6) leading in average scores. These districts, predominantly rural, exhibit stronger environmental awareness due to their direct dependence on natural resources (Schultz et al., 2014). In contrast, Assiut City (M = 50.3) recorded the lowest scores, which could be attributed to urban challenges such as reduced access to natural spaces and competing priorities (Huddart-Kennedy et al., 2015). The Kriging map (Figure 1) visually confirms these findings, emphasizing higher scores in rural areas and lower scores in the urban core of Assiut.

The Kriging map (Figure 1) further illustrates these disparities, with Sedfa and El-Badary emerging as hotspots for pro-environment behavior, while Assiut City and its surrounding areas exhibit significantly lower scores. This spatial pattern aligns with the statistical findings and highlights the rural-urban divide in environmental attitudes.

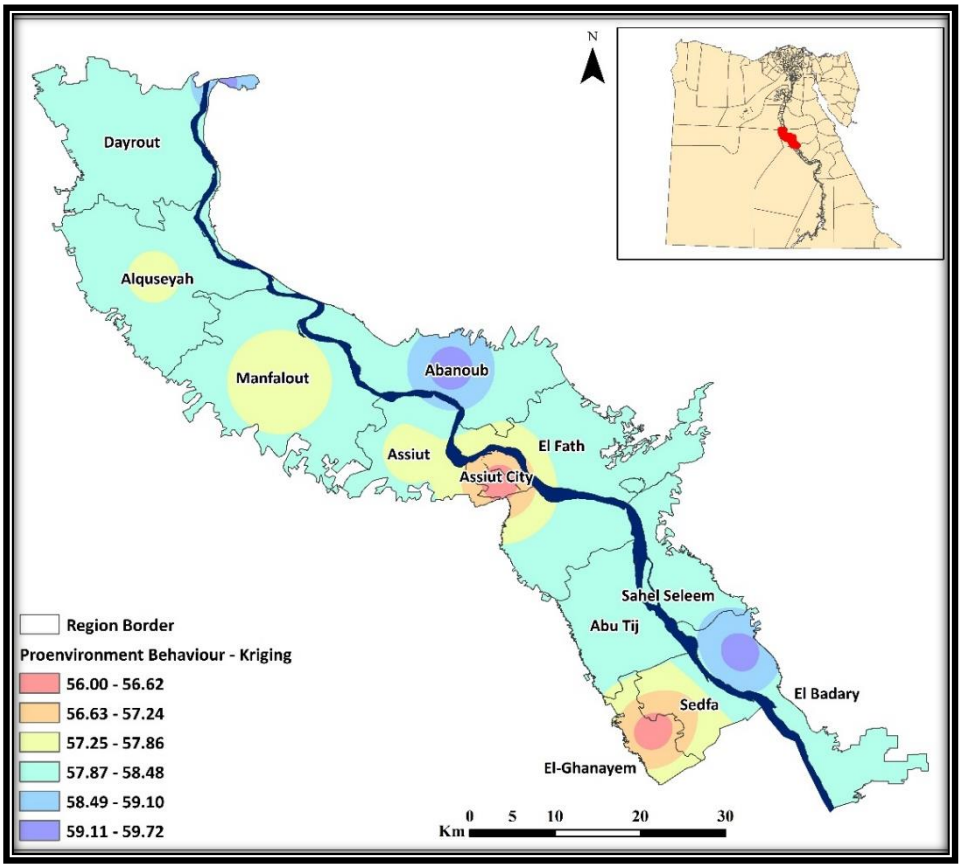

Figure (2) Spatial Distribution of Pro-environment Behavior in Assiut Governorate (Kriging Method)

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Self-esteem levels varied significantly across administrative centers, with El-Badary (M = 17.8) and Sedfa (M = 17.5) leading. These rural areas often exhibit strong social cohesion and stability, which are known to positively influence self-worth (Harter, 1999; Rosenberg, 1965). The agricultural nature of these regions may also contribute to creating a stable environment that fosters a stronger sense of identity and self-esteem. Conversely, El-Ghanayem (M = 15.9) recorded the lowest score, potentially reflecting socio-economic challenges such as limited resources and economic instability, which are factors that can negatively impact self-esteem (Baumeister et al., 2003). The spatial distribution map (Figure 3) visually supports these findings, with El-Badary and Sedfa highlighted as regions of higher self-esteem, while El-Ghanayem is marked by lower scores. These results emphasize the importance of local socio-environmental conditions in shaping adolescent self-esteem.

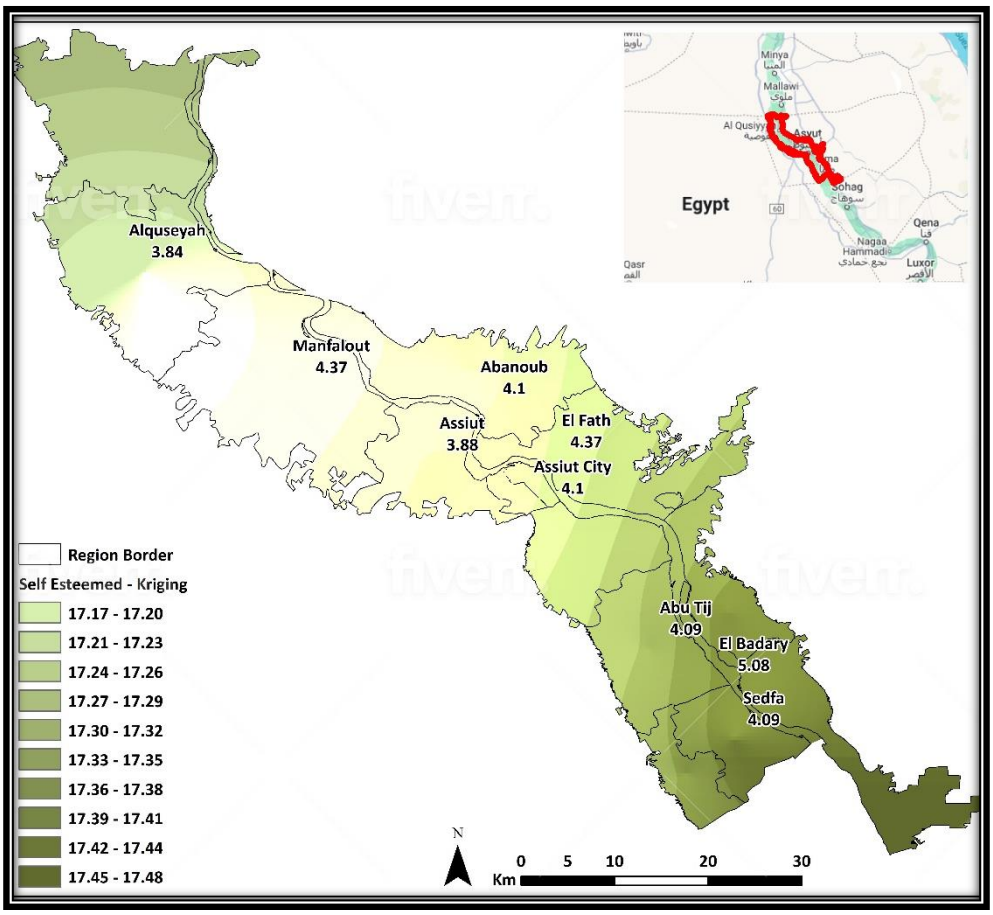

Figure (3) Spatial Distribution of Self-Esteem Among Administrative Centers in Assiut Governorate (Kriging Method)

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The analysis of environmentalist identity across administrative centers reveals notable variations. El-Badary recorded the highest average score (M = 5.08), followed by Sedfa (M = 4.80) and Manfalut (M = 4.55). These results suggest that rural areas exhibit a stronger environmental identity, potentially due to their close proximity to natural resources and reliance on agriculture. In contrast, Assiut City exhibited the lowest average score (M = 4.00), which may reflect reduced interaction with natural environments and urban challenges such as pollution and lack of green spaces. "The Kriging map (Figure 4) supports these findings, highlighting El-Badary and Sedfa as regions with the highest environmentalist identity scores, while Assiut City appears as the lowest-scoring area. This spatial pattern emphasizes the influence of geographic and socio-environmental factors on environmental attitudes.

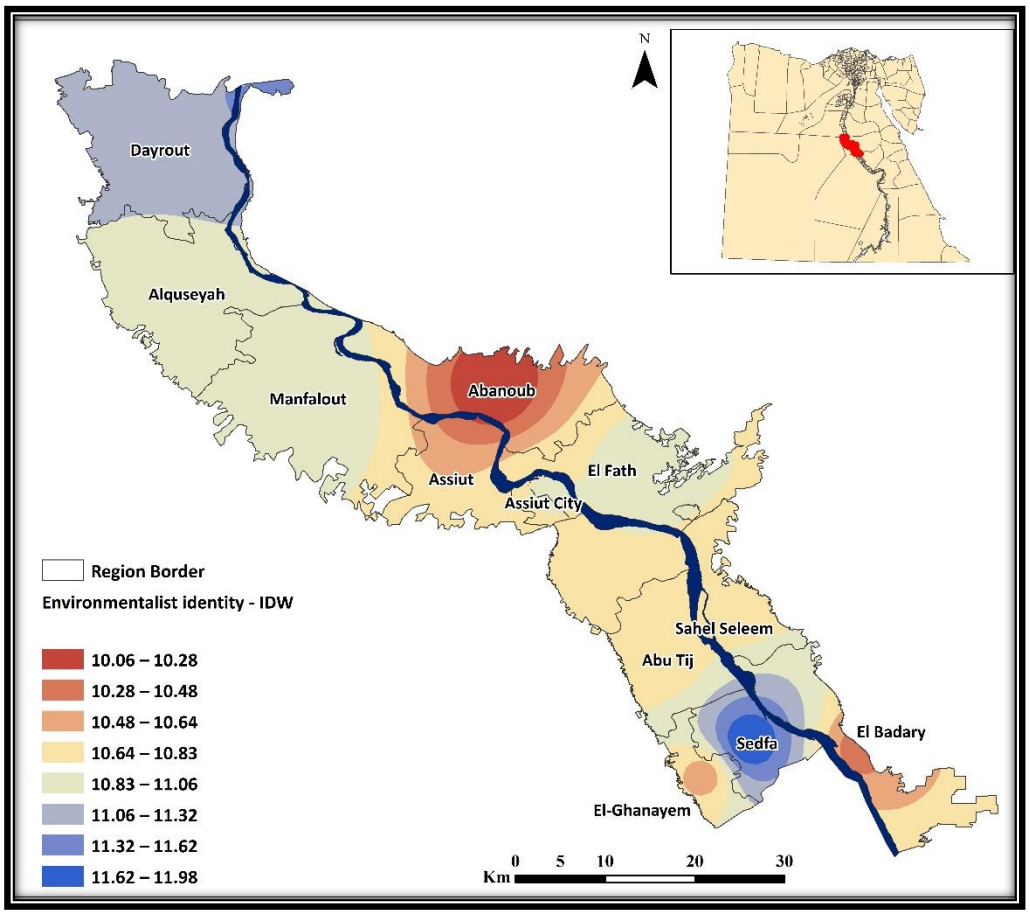

Figure (4) Spatial Distribution of Environmentalist Identity Among Administrative Centers in Assiut Governorate (IDW Method)

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Discussion

1. Interpretation of Findings

This present study indicates that the maturity of the respondents was markedly associated with the significant impact of self-esteem on the relationship between satisfaction with life and environmentalist identity. It identifies the potential value to the self of enhancing the quality of life by developing an environmentalist identity via self-esteem.

Self-esteem results from a personal assessment of one's skills, traits, and worth. Consequently, a positive self-image, self-assurance about one's abilities, and strong self-respect are characteristics of people with high self-esteem. People with low self-esteem, on the other hand, might experience insecurity, have negative self-images, and doubt their own talents. Numerous things, such as life experiences, interpersonal relationships, and individual beliefs and values, can impact self-esteem.

According to (Marcionetti & Rossier, 2021), self-esteem may mediate between environmentalist identity and life happiness. This implies that the strength of the relationship between an individual's environmentalist identity and degree of life happiness may depend on their level of self-esteem.

For instance, Zhao (Zhao, 2023) discovered a positive association between environmentalist identity and life happiness, with self-esteem serving as a partial mediating factor. People with greater levels of self-esteem are more likely to have a stronger correlation between life happiness and environmentalist identification. This indicates that those with greater levels of self-esteem may feel more fulfillment and satisfaction from their environmentalist identity, which in turn affects how satisfied they are with their overall quality of life. To completely comprehend the intricate connection between environmentalist identity, self-esteem, and life pleasure, additional study is nonetheless required (Kupcewicz et al., 2020).

The relationship between satisfaction with life and an environmentalist identity provides potential characteristics that both possess. An individual's overall assessment of their life and level of satisfaction is referred to as their level of satisfaction with life (Guasp Coll et al., 2020). Wang (Wang & Kong, 2020) argue that satisfaction with life is a personal assessment differing from person to person but is affected by various variables, including values and beliefs as well as specific personal situations. According to Chu & Koo (Chu & Koo, 2023), many outcomes, such as happiness, longevity, and good mental and physical health, are all positively correlated with life satisfaction. Moreover, Swaidan (Swaidan, 2021) reports that social support, healthy relationships, financial stability, and a feeling of meaning or purpose in life are all factors associated with greater life satisfaction.

The fact that satisfaction with life is connected to the environmentalist identity

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suggests that some characteristics enhance the qualitative growth and development of life. The literature extensively identifies direct connections to the satisfaction with life in extreme passion for the environment (van Doeselaar & Reitz, 2023), proactivity (Coffey & Warren, 2020), environmental knowledge (Huffman et al., 2020), emotional intelligence (Reitz et al., 2022) and a collaborative approach (Taşdemir, 2020).

Freire & Ferreira (Freire & Ferreira, 2020) report that the significant impact of self-esteem on social identity and satisfaction with life remarkably affiliates with the property of generalizability because it provides an in-depth understanding of the construct. (Asgeirsdottir & Sigfusdottir, 2021) and (Kim & Nho, 2020), report that self-esteem is a self-identity modifying variable that influences satisfaction with life and environmentalist construct related to identity. This is congruent with this study's basic identification of the potential impact of the relationship between satisfaction with life and an environmentalist identity on human life. Moreover, (Hlaďo et al., 2022) nominate a similar construct about self-esteem providing strength to the human character and decreasing the negative consequences associated with human life. (Reitz et al., 2022) also report that the dark side of self-esteem influences the construct of human personality congruent with life satisfaction and environmentalist identity.

Furthermore, environmentalist identity is based on pre-environment behavior relating to satisfaction with life (Granjo et al., 2021). (Yüksel Doğan & Metin, 2023) formulate similar distinctive predictive constructs associating satisfaction with life and self-esteem with the environmentalist identity and pro-environmental behavior.

(Szcześniak et al., 2021) identify the impact of self-esteem on the environmentalist identity with the positive and proactive strength to manage human life by using a stable lens. (Bum et al., 2021)argue that pro-environmental behaviors require an effective and extensively mature self-esteem to be highly influential in meeting the demands of satisfaction with life. Subjectivity in satisfaction with life identifies the connection of environmentalist identity with the desirability and achievement in life (Heemstra, 2020). (Szcześniak & Timoszyk-Tomczak, 2020) argue that satisfaction in life is one of the most important paradigms that intrinsically and extrinsically affect a student's socio-economic dynamics and cultural paradigm. As a result, (Szcześniak et al., 2022) maintain that a vast number of healthy projections, especially related to mental health, are required for the adolescent to construct elevating strategies for self-esteem. They also indicate that the predictability of satisfaction with life and self-esteem imposes a connection with an environmentalist identity and pro-environmental behavior to conserve psychological stability. All these indicate that adolescent self-esteem plays a vital role in satisfaction with life and enhances an environmentalist identity. This help to elevate the positive personality with the conjugated environmental behavior. This study's results indicate that effective self-esteem enhances quality of life, so it becomes satisfaction with life; quality of life worsens

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with ineffective self-esteem.

There are limitations to this present study. One is that the research predominantly uses self-reported scores, which might be prone to response or social desirability biases to measure the association between environmentalist identity, self-esteem, and life happiness. In other words, people could overestimate or underestimate their sense of self-worth, life happiness, or environmental identification, which could impact the findings' accuracy. Additionally, the research may not be generalizable to other cultural situations because it has been done exclusively in Western societies. Other cultures may have varied perspectives on environmentalist identity, which may link differently with self-worth and life fulfillment. Furthermore, because most of the research has been correlational, it is difficult to infer any causal relationships between environmentalist identity, self-esteem, and life satisfaction. Future research may benefit from employing experimental or longitudinal approaches to understand the temporal correlations between these factors further.

In the light of the most recent studies, people who want to improve their environmentalist identity and general life happiness should concentrate on enhancing their self-esteem. This can be accomplished in many ways, including establishing and attaining personal objectives, looking for supportive social networks, and participating in activities encouraging self-care and self-acceptance. As these can increase the sense of connection and fulfillment related to environmentalist identity, engaging in environmental activities or behaviors consistent with one's values and beliefs may be beneficial. Finally, when interpreting the findings of the studies on environmentalist identity, self-esteem, and life satisfaction, it is critical to be aware of the limitations of self-reported measures and consider the cultural context.

2. Practical Implications

These findings have several practical implications for educators, policymakers, and community leaders:

1. **Educational Programs:** Schools can integrate activities that promote environmental awareness and emphasize personal development to enhance self-esteem among adolescents.

2. **Community Initiatives:** In rural areas, leveraging existing community networks can further strengthen environmentalist identity. In urban centers, policymakers should prioritize creating green spaces and supporting initiatives that foster environmental consciousness.

3. **Policy Development:** Governments can develop targeted campaigns to raise awareness about the importance of environmentalist identity and its connection to

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personal well-being, particularly in underprivileged urban areas.

4. **Adolescent Support:** Social programs aimed at building self-esteem—such as workshops on emotional intelligence and personal goal-setting—could further bridge the rural-urban divide in life satisfaction and environmental awareness.

3. Limitations

While the findings provide valuable insights, several limitations must be acknowledged:

- **Self-Reported Data:** The reliance on self-reported measures introduces potential response biases, as participants may overestimate or underestimate their self-esteem, life satisfaction, or environmental identity.

- **Cultural Specificity:** The study is limited to a specific cultural context (Assiut Governorate), which may not generalize to other regions or countries with different socio-environmental dynamics.

- **Cross-Sectional Design:** The research employs a cross-sectional design, limiting the ability to infer causal relationships between the variables.

- **Focus on Adolescents:** While the study focuses on adolescents, future research could expand the scope to include other age groups for broader comparisons.

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4. Future Directions

To build upon these findings, future studies should:

1. **Expand Geographical Scope:** Explore the relationship between self-esteem, environmentalist identity, and life satisfaction across diverse cultural and geographic settings to improve generalizability.

2. **Longitudinal Studies:** Conduct longitudinal research to uncover how these relationships evolve over time and identify potential causal links.

3. **Incorporate Qualitative Methods:** Use interviews and focus groups to gain deeper insights into adolescents' lived experiences and the socio-environmental factors influencing their self-esteem and environmentalist identity.

4. **Intervention Studies:** Test the effectiveness of specific programs or policies designed to enhance self-esteem and environmental awareness in both urban and rural

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settings.

Conclusion

According to studies, self-esteem among teenagers is a significant intermediary variable in the link between life happiness and environmentalist identity. Environmentalist identity positively correlates with life happiness, and this link is largely mediated by self-esteem. Therefore, enhancing their sense of worth may help adolescents feel more connected to their surroundings and more content with their lives. Comprehending the intricate interaction between these factors is necessary for identifying the most efficient strategies for fostering environmentalist identity and life happiness in teenagers.

List of Abbreviations

SWLS Satisfaction with Life Scale
EIS Environmental Identity Scale
CMIN Chi-Square
DF Goodness of Fit Index
P p value
AGFI Adjusted Goodness of Fit
NFI Normed Fit Index
GFI Goodness of Fit
CFI Comparative Fit Index
RMSEA Root Mean Square Error of Approximation
SE Standard Error
CR Comparative Fit Index

Preliminary Consent and Data Confidentiality

Preliminary Consent:

Prior to their participation, all participants were informed about the scientific objectives of the study. They were assured that their personal data would not be disclosed in any form and would be used solely for research purposes. Participants provided their preliminary consent to participate based on this understanding.

Data Confidentiality:

In accordance with the Helsinki Declaration, all personal identifiers have been removed to ensure the anonymity of participants. Data collected will be stored securely and accessed only by the research team for analysis. No individual data will be published or shared publicly.

Ethical Compliance Statement:

This study complies with the ethical principles outlined in the Helsinki Declaration, ensuring the protection of participants' rights, confidentiality, and well-being throughout the research process.

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