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Future Thinking and Sustainable Career Perceptions in Emerging Adults: The Mediating Role of Environmental Concern

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Abstract: Emerging adulthood, characterized by identity exploration and optimism for the future, provides a unique context for examining the interactions between psychological and environmental factors that shape career perceptions. Positive future thinking, defined as the ability to imagine and plan long-term goals, is associated with greater resilience and adaptability. Simultaneously, environmental concern emerges as a critical driver of values and perceptions, reflecting commitment to social and environmental well-being. Sustainable careers that integrate personal growth, well-being, and contributions to societal goals are increasingly relevant at this stage of life. This study aimed to investigate the mediating role of environmental concern in the relationship between positive future thinking and sustainable career perceptions in a sample of 266 Italian emerging adults (ages 18–29, $M = 22.25$, $SD = 2.21$). Structural equation modeling indicated that the hypothesized mediation model fit the data well. The results revealed significant direct effects of positive future thinking on both environmental concern and sustainable career perceptions, as well as a significant indirect effect through environmental concern. These findings highlight the psychological pathways linking positive future thinking, environmental concern, and sustainable career perceptions and provide insights for promoting adaptive and future-oriented behaviors in emerging adulthood. By doing so, this study contributes to the advancement of Sustainable Development Goals 4 (Quality Education), 8 (Decent Work and Economic Growth), and 13 (Climate Action).

Keywords: development; education; emerging adulthood; positive future thinking; environmental concern; sustainable career

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1. Introduction

In recent years, the need to align individual career development with environmental and social sustainability has become increasingly urgent. As the challenges of climate change, resource exhaustion, and social inequality intensify, the younger generation is expected to play a key role in shaping a more sustainable future. In this context, the developmental period of emerging adulthood, typically between 18 and 29, represents a critical stage in which individuals begin to form their adult identities, make fundamental life choices, and define long-term career trajectories.

Recent research in sustainability psychology and sustainable development has emphasized the significance of psychological resources and processes that promote

sustainability-oriented objectives, especially among younger populations [1]. Young adults are motivated by more than just personal and professional success; they are also motivated by values such as environmental responsibility, social impact, and collective well-being. The concept of eco-generativity, defined as acting with care and responsibility toward future generations and the environment, was recently introduced to describe this future-oriented commitment [2]. Other studies have shown that university students' self-perception of their interest, motivation, and self-efficacy regarding the United Nations Sustainable Development Goals (SDGs) reflects their internalization of sustainability principles and the relevance of these principles to personal life planning [3].

While some previous studies have examined the role of future orientation in career development [4,5] and others have explored environmental concern and career choices [6], little empirical work has investigated how these two domains interact in the context of sustainable career planning. To the best of our knowledge, no prior studies have examined the mediating role of environmental concern in the relationship between positive future thinking and sustainable career perceptions. This study contributes to filling this gap by integrating cognitive and affective variables to better understand how emerging adults conceptualize and aspire to sustainability-oriented careers. Little is known about the psychological mechanisms that support the integration of sustainability principles into young people's career planning. In particular, there is a need to understand how future-oriented cognitive processes and affective environmental attitudes interact to shape perceptions of sustainability-related careers.

The present study addresses this gap by examining the interaction between positive future thinking, environmental concern, and sustainable career perceptions in a sample of Italian emerging adults. The aim is to investigate whether the ability to imagine and plan for a positive future is associated with sustainability-oriented career goals, and whether levels of environmental concern mediate this relationship.

To this end, this study addresses the following research questions:

- Is positive future thinking associated with higher levels of environmental concern?
- Does positive future thinking predict perceptions of sustainable careers?
- Does environmental concern mediate the relationship between positive future thinking and perceptions of sustainable careers?

2. Literature Review

2.1. Emerging Adulthood, Future Thinking, and Environmental Concern

Emerging adulthood, conceptualized by Jeffrey Arnett [7,8], refers to the transitional developmental period from late adolescence to early adulthood, typically between 18 and 29. This stage is characterized by an increased focus on identity exploration, relationships, career transitions, and pursuing personal goals [9,10]. Unlike adolescence, which is also identified as a period of transition and identity exploration [11], emerging adulthood is characterized by increasing independence from family. However, the stability traditionally associated with full adulthood is often not yet achieved [12].

Five key characteristics of this stage have been described by Sussman and Arnett [13]: *identity exploration* in areas such as love, work, and worldview; *instability* due to frequent changes in living arrangements, education, and career paths; a strong emphasis on *self-focus*, which allows individuals to prioritize personal growth and decision-making autonomy; a sense of *feeling in-between*, in which emerging adults perceive themselves as neither adolescents nor fully adults; and an enduring *optimism* among emerging adults about their future possibilities, which underscores a belief in the potential for positive transformation associated with this particular period of life. These characteristics emphasize the duality of emerging adulthood, characterized as a period of significant opportunities but also of

demanding challenges to face. On the one hand, it offers a unique space for self-definition and pursuing long-term life goals; on the other hand, it requires adaptive coping strategies to deal with uncertainties and external pressures [8].

Emerging adulthood also reflects broader socio-economic and cultural changes. Not surprisingly, Arnett [8] describes this stage of development as typical of industrialized societies. Indeed, social changes that characterize industrialized and capitalist cultures, such as longer educational trajectories, delayed entry into stable employment, and the postponement of traditional milestones such as marriage and parenthood, have redefined the developmental landscape of this life stage by requiring greater emphasis on adaptability, lifelong learning, and the ability to navigate an increasingly unpredictable global environment [7,9,14].

In this context, future thinking, the cognitive and emotional ability to imagine and plan for long-term goals [15], is key in equipping emerging adults to cope with these specific developmental demands. Research shows that the ability to project into the future not only facilitates the achievement of personal goals but also increases resilience and psychological well-being [16,17]. Future thinking integrates the cognitive, affective, and social dimensions. From a cognitive perspective, it involves goal setting, scenario planning, and evaluating potential outcomes. From an affective perspective, it is based on optimism, self-efficacy, and persistence. From a social perspective, it is shaped by interactions with others, including family, peers, and mentors, as well as cultural and social norms [17,18]. In addition, neuroscientific evidence underlines the role of brain regions such as the hippocampus and amygdala in supporting the imaginative simulation of future events, linking this capacity to memory and emotional regulation [19].

At the same time, environmental sustainability has become a defining concern for this generation [20]. As environmental issues become increasingly important worldwide, many emerging adults view sustainability not only as a social responsibility but also as a framework to guide personal and professional decisions [21,22]. *Environmental concern* is a critical construct that reflects individuals' attitudes and feelings toward environmental problems and their consequences. Environmental concern has been defined by Schultz et al. [23] as an affective component associated with beliefs regarding environmental problems; the authors classified it into three domains: egoistic, social-altruistic, and biospheric concern [24]. *Egoistic concern* focuses on how environmental issues affect an individual's health, lifestyle, and future. *Social-altruistic concern* emphasizes the impact on other people, including children and future generations, whereas *biospheric concern* refers to the consequences for non-human species and ecosystems [25]. These domains often interact and shape pro-environmental attitudes and behaviors [24,26]. While future thinking has been studied in the context of individual adjustment, its role in shaping environmental attitudes, particularly in emerging adulthood, remains underexplored. Although some studies suggest that future-oriented individuals may be more concerned about global issues [20], empirical research on how future thinking predicts environmental concern in this age group remains limited.

However, recent studies provide increasing support for a potential link between positive future thinking and environmental concern. Evidence suggests that individuals with stronger future time perspectives were more likely to make sustainable tourism choices, suggesting that concern for long-term consequences may drive environmentally responsible behavior [27]. Similarly, Jia et al. [21] showed that generative concern, which is closely related to the development of a future-oriented identity, predicts greater environmental commitment among emerging adults. These data are further supported by the recent work of Lalot et al. [28], who showed that individuals with high future consciousness, a construct that refers to the capacity to understand, anticipate, and prepare for the future, are significantly more likely to engage in pro-environmental behaviors. Furthermore,

Arpawong et al. [29] showed that future-oriented cognition supports positive psychosocial change and increased awareness of societal challenges, including environmental issues. These findings suggest a potentially crucial psychological pathway through which future-oriented cognition promotes greater attention to environmental issues in emerging adulthood.

Therefore, we hypothesize the following:

H1: *Positive future thinking is positively associated with environmental concern, and emerging adults with higher levels of positive future thinking are more likely to show greater environmental concern.*

2.2. Positive Future Thinking and Sustainable Career Perceptions

As emerging adults navigate educational and career transitions, they often seek not only financial stability but also personal meaning and social relevance in their work.

The concept of *sustainable careers* reflects this integration, encompassing careers that combine personal well-being, adaptability, and contributions to environmental and social goals [30,31]. This construct is receiving increasing attention as traditional career models, strongly associated with stability and lifetime employment, are gradually being replaced with dynamic and flexible approaches that emphasize adaptability and proactive career management [32,33]. A sustainable career encompasses three key dimensions: individual agency, contextual support, and temporal adaptability. From an individual perspective, sustainable careers require proactive decision-making, continuous learning, and the ability to align personal values with professional activities. From a contextual perspective, they depend on the support of organizational structures and family and community networks. From a temporal perspective, they involve continuous adaptation to changing socio-economic and environmental conditions [34,35].

The value of sustainable careers is particularly significant for emerging adults, who are uniquely positioned to use their future thinking skills and environmental awareness to shape meaningful and resilient career paths [14]. Sustainable careers provide a framework for addressing both personal perceptions and broader societal challenges, emphasizing the importance of integrating skills development, environmental responsibility, and professional adaptability. This approach not only supports individual growth but also promotes collective progress toward a more equitable and sustainable future.

Positive future thinking is likely to support pursuing such careers by enhancing an individual's ability to envision long-term, value-oriented goals. Previous research has shown that future orientation is associated with goal setting, persistence, and proactive planning, all essential for adaptive career development [17,18]. Future-oriented youth are more likely to invest in meaningful and self-congruent career trajectories [36]. Time perspectives have also been shown to support the pursuit of value-oriented career paths that align with both personal and social goals [37]. In addition, Xiao et al. [38] found that future orientation mediated the relationship between neighborhood disadvantage and academic achievement, suggesting its broader role in promoting agency and long-term planning. In the context of vocational rehabilitation, Härkäpää et al. [39] confirmed that positive future perceptions significantly enhance participation and investment in career-related initiatives.

These findings suggest that future thinking not only supports personal resilience but also influences how individuals evaluate their career paths in terms of meaning, adaptability, and social relevance.

Therefore, we hypothesize the following:

H2: *Positive future thinking is positively associated with perceptions of sustainable careers, with more positive-future-thinking emerging adults more likely to pursue careers aligned with sustainability principles.*

2.3. The Mediating Role of Environmental Concern

Although positive thinking about the future may directly influence career perceptions, concern for the environment may act as a mediating mechanism through which future-oriented thinking favors sustainability-oriented career goals. Emerging adults who are optimistic about the future and concerned about environmental issues may be particularly inclined to pursue careers that contribute to sustainable development.

The recent literature provides preliminary support for this interaction. For example, Hodgkinson and Innes [40] found that students' environmental attitudes were significantly influenced by their academic and career aspirations, suggesting that sustainability concerns may shape career-related motivations. In addition, Lalot et al. [28] showed that individuals with high levels of future consciousness, which includes temporal perspective, concern for others, and systemic awareness, reported greater environmental commitment and intention to act sustainably. These dimensions may act as psychological channels that translate cognitive optimism into sustainable career goals.

Further support comes from Arnocky et al. [41], who tested a two-factor model of *consideration of future consequences* and found that individuals less focused on immediate gratification reported greater environmental concern and sustainable behavior, regardless of their explicit long-term values. In addition, experimental priming of future thinking increased environmental concern and sustainable behavior intentions. These findings suggest that future orientation promotes environmental concern, particularly when it involves less focus on short-term benefits, and highlight a critical psychological mechanism in sustainability-related decision-making.

From a broader perspective, the sustainable employability model proposes that personal resources (e.g., future orientation) and motivational attitudes (e.g., environmental concern) jointly contribute to career development outcomes [30,34]. This framework is consistent with evidence from longitudinal studies showing that prosocial and future-oriented goal setting, which is closely linked to environmental and social concerns, mediates the influence of personal values on life goals and career development [21,42].

In light of these findings, environmental concern is not only an outcome of future-oriented cognition but also a potential psychological link through which individuals translate their future visions into concrete career intentions aligned with sustainability principles.

Therefore, we hypothesized the following:

H3: *Environmental concern mediates the relationship between positive future thinking and sustainable career perceptions, suggesting that positive future thinking indirectly promotes sustainability-oriented career goals through increased environmental awareness.*

2.4. Career Development and Sustainable Development Goals

The United Nations has urged individuals and governments to address the issue of a sustainable future through the 2030 Agenda for Sustainable Development [43], which outlines 17 Sustainable Development Goals (SDGs) aimed at tackling global challenges such as poverty, inequality, climate change, and access to education and decent work. Governments around the world are responding to this call, and researchers have also mobilized to advance the goals set forth in the 2030 Agenda. In the field of career development, scholars have discussed the implications of sustainability for lifelong career planning and guidance [44–46].

Specifically, scholars highlight the need to integrate sustainability and sustainable development into all areas of higher education [47,48], an objective that requires systemic transformations within the higher education system [49]. University educators play a key role in embedding sustainability-related knowledge and skills into academic courses and curricula. However, awareness of sustainable development does not automatically translate into behavior [50]; rather, the knowledge and competencies acquired must be effectively transferred into concrete practices in both daily life and professional settings [51].

The present research is situated within the framework of the United Nations' 2030 Agenda for Sustainable Development [43]. In particular, this study aligns with SDG 4 (Quality Education), which promotes the acquisition of skills for sustainable development and life planning; SDG 8 (Decent Work and Economic Growth), which emphasizes the need for inclusive and sustainable career opportunities; and SDG 13 (Climate Action), which calls for increased awareness and behavioral change in response to environmental challenges.

3. Materials and Methods

3.1. Participants and Procedure

The minimum sample size required for this study was determined a priori using Soper's software (version 4.0) [52] for structural equation modeling (SEM). Based on a significance level (α) of 0.05, a statistical power of 95%, 3 latent variables, 8 observed variables, and a small effect size (0.10), the estimated minimum sample size necessary was 256 participants.

Data were collected through an online research protocol. Participants were provided with a detailed description of the study's objectives, the estimated time required for completion, and assurance that there were no physical or psychological risks involved. Informed consent was obtained prior to participation. Anonymity was strictly maintained by avoiding the collection of any personal information. Furthermore, participants were assured that the data would be analyzed collectively, preserving their confidentiality.

The following criteria were used for inclusion: participants were required to be aged between 18 and 29 years, be university students, and have Italian as their native language.

A total of 266 participants completed the study, exceeding the minimum sample size required to test the hypothesized model. Among the participants, 88 identified as male, 171 identified as female, 4 preferred not to disclose their gender, and 3 identified as "Other" without providing further specification. Participant ages ranged from 18 to 29 years (M = 22.25, SD = 2.21). The majority (n = 233) were studying in Sicily, in Southern Italy. Regarding their academic paths, 72 participants were enrolled in a single-cycle degree program, 147 were pursuing a bachelor's degree, and the remaining 47 were enrolled in a two-year master's degree program. In terms of educational qualifications, 219 participants had a high school diploma, while the remaining 47 held a bachelor's degree.

3.2. Ethical Considerations

This research was carried out in line with the ethical standards of the Declaration of Helsinki. Before data collection commenced, the research protocol was reviewed and approved by the University of Catania's Ethics Committee. As the study presented no risks to participants, ethical approval was granted (approval number: Ierb-Edunict-2024.03.07/08).

3.3. Measures

The following measures were used:

The *Future Thinking Questionnaire* (FTQ) [15] is a validated measure in Italian, consisting of 18 items designed to assess three latent dimensions: negative future thinking, positive future thinking, and avoidant future thinking. In the present study, we utilized only the 7 items measuring Positive Future Thinking, which comprises two subdimensions: persistence (4 items, e.g., "I will do what I have always wanted to do") and fantasies (3 items, e.g., "In the end, everything will work out"). Participants rated their agreement or disagreement with each statement on a 5-point Likert scale ranging from 1 (not at all) to 5 (completely). The internal consistency of the scale was assessed using McDonald's Omega, which yielded a value of 0.91.

The *Environmental Concern Scale* (ECS) [25] is a measure consisting of 8 items that assess concern for the biosphere (animals, plants, marine life, birds) and concern for oneself (me, my lifestyle, my health, and my future) in relation to environmental issues. Participants read the following instructions: "*People around the world are generally concerned about environmental problems due to the consequences of damaging nature. However, people differ in which consequences affect them the most. Please rate each of the following from 1 (not important) to 7 (very important) in response to the question: I am concerned about environmental problems because of the consequences for ...*". To evaluate reliability, McDonald's Omega was computed and resulted in a value of 0.82.

The *Future-Sustainable Career Scale* (F-SCS) [53] is a 16-item instrument designed to measure individuals' perceptions of a sustainable career path based on the theoretical framework of Russo et al. [31,54]. The scale encompasses four dimensions: happiness (e.g., "I will feel personally fulfilled in my future career"), productivity (e.g., "My future career will enable me to leverage my skills and talents"), health (e.g., "My future career will be a source of well-being"), and social impact (e.g., "I believe my future career can positively influence society"). Respondents indicated their level of agreement with each statement using a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). A McDonald's Omega value of 0.91 was obtained, supporting the internal consistency of the measure.

3.4. Data Analysis

Preliminary analyses were conducted using SPSS version 25.0 to assess the reliability and validity of the employed measures.

Parcel creation was performed before the SEM analysis. Latent variables representing each measured dimension were constructed using a partially disaggregated parceling approach, which improves model fit compared to single-item approaches [55]. Parcels were created using a domain-representative approach, combining items from different subscales to ensure balanced representation [55,56].

A mediation model was estimated using maximum likelihood estimation within the SEM framework [56]. Structural equation modeling (SEM) allowed for the simultaneous estimation of direct and indirect effects between observed and latent variables. This approach is consistent with previous research adopting similar analytical strategies [57–60], and supports the robustness of the current methodological framework. Model fit was evaluated using several indices: the chi-square-to-degrees-of-freedom ratio, Comparative Fit Index (CFI), and Standardized Root Mean Residual (SRMR). Acceptable model fit was determined by cutoff values of 1–5 for the chi-square ratio, <0.08 for SRMR, and >0.90 for CFI [55]. A bootstrap analysis with 1000 resamples was performed to test the significance of mediation effects [57]. A 95% bias-corrected confidence interval that did not include zero for the indirect effect was considered indicative of significant mediation. The variance explained (R^2) was reported for all dependent variables to evaluate the explanatory power of the model.

We also examined whether the effects estimated by the model were comparable between men and women using a multi-group analysis. To this end, we followed standard procedures for testing measurement invariance. The first step involved testing for configural invariance, which assesses whether the overall factor structure is equivalent across groups.

Next, we tested for metric invariance by constraining the factor loadings to be equal across groups, in order to determine whether the items contributed similarly to the definition of the latent constructs for both men and women. Finally, we assessed structural invariance by constraining the structural relationships between latent constructs (i.e., the model paths) to be equal across groups, allowing us to examine whether these relationships differed by gender or remained consistent [61].

The measurement invariance and potential differences in model fit between groups were evaluated by comparing the fit indices of nested models. According to the literature [62], invariance is considered acceptable when the change in CFI (ΔCFI) is less than 0.01 and the change in RMSEA (ΔRMSEA) is less than 0.015.

All these analyses were conducted using AMOS version 22.0.

4. Results

Table 1 presents the mean value scores and standard deviations for each dimension, as well as the correlations between the dimensions, as measured by the Pearson coefficient (*r*).

Table 1. Mean values, internal consistency, and correlation between dimensions.

	M	SD	1.	2.	3.
1. Positive Future Thinking	2.99	0.72	-		
2. Environmental Concern	5.70	0.98	0.30 *	-	
3. Sustainable Career	3.66	0.66	0.68 *	0.42 *	-

Note. M = mean; SD = standard deviation; * $p < 0.01$.

The hypothesized mediated model demonstrated adequate fit to the data: $\chi^2 = 57.253$; df = 17; $\chi^2/df = 3.368$; CFI = 0.959; and SRMR = 0.041.

Figure 1 shows the gamma coefficients for the relationships between positive future thinking and environmental concern ($\beta = 0.496$, $p < 0.01$), positive future thinking and sustainable career ($\beta = 0.684$, $p < 0.01$), and environmental concern and sustainable career ($\beta = 0.304$, $p < 0.05$).

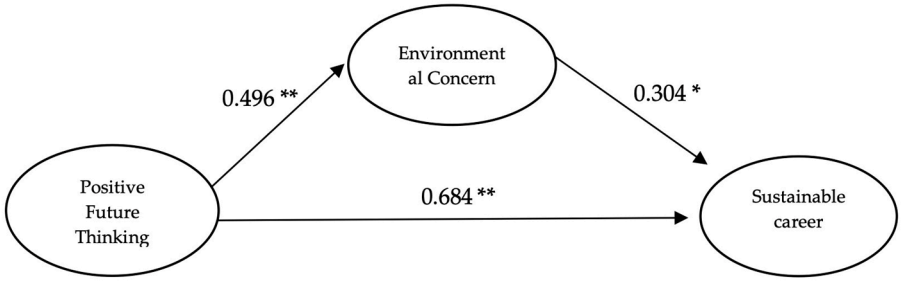

Figure 1. Hypothesized mediation model with estimate coefficients (** $p < 0.05$; * $p < 0.01$).

The difference in the indirect effect of positive future thinking through sustainable career and environmental concern was significant, with $\beta_{indirect} = 0.151$. The bootstrap analysis highlighted that the bootstrap BC confidence interval was between 0.045 and 0.286; this indicates that the mediation effect is significantly different from zero in both cases.

Overall, the model explains 24.6% of the variance in environmental concern and 76.7% in sustainable career ($R^2 = 0.246$, $R^2 = 0.767$).

To verify gender invariance, we proceeded by conducting a multi-group SEM. The results are summarized in Table 2. Configural, metric, and structural invariance was confirmed ($\Delta CFI < 0.01$ and $\Delta RMSEA < 0.015$). Therefore, the model had no significant differences between males and females.

Table 2. Measurement invariance across genders.

Model	Model Fit				Model Comparison	
	χ^2/df	RMSEA (90% C.I.)	CFI	SRMS	ΔRMSEA	ΔCFI
Configural invariance	2.517/34 *	0.077 (0.057–0.097)	0.947	0.061	-	-
Metric invariance	2.342/39 *	0.072 (0.053–0.092)	0.946	0.065	0.005	0.001
Scalar invariance	2.280/42 *	0.071 (0.052–0.089)	0.945	0.077	0.001	0.001

Note. * $p < 0.01$.

5. Discussion

The present study aimed to examine the mediating role of environmental concern in the relationship between positive future thinking and sustainable career perceptions among Italian emerging adults. By focusing on this transitional developmental stage, characterized by identity exploration, instability, and optimism about the future, the study highlights the unique developmental context in which these psychological processes occur. Emerging adulthood, as defined by Arnett [7], undoubtedly provides a critical period for examining how cognitive and emotional factors shape long-term career trajectories.

The first research hypothesis (H1) proposed that positive future thinking would be positively associated with environmental concern. The results supported this hypothesis, consistent with previous research suggesting that emerging adults who actively engage in future thinking are more likely to develop greater awareness of environmental issues [27]. This finding highlights the role of emerging adulthood as a period of increased social and environmental awareness, where individuals begin to align their personal goals with broader societal concerns. Positive future thinking, defined as the ability to envision long-term goals, promotes an optimistic and proactive mindset that encourages emerging adults to consider the long-term impact of their actions on the environment. This cognitive orientation is consistent with the developmental task of integrating personal values with social responsibility, which is a hallmark of this life stage [8].

The second hypothesis (H2) predicted that positive thinking about the future would be positively associated with sustainable career perceptions in Italian emerging adults. This relationship was also confirmed, reinforcing the idea that emerging adults, who are making career decisions and planning their lives, are particularly receptive to integrating sustainability into their career perceptions. The ability to think positively about the future enables these individuals to envision careers that not only fulfill personal ambitions but also contribute to social and environmental well-being [63]. This finding is consistent with the developmental emphasis on establishing a coherent life direction during emerging adulthood, when career choices become a critical means of expressing personal and social values [64].

Finally, the third hypothesis (H3) suggested that environmental concern would mediate the relationship between positive future thinking and sustainable career perceptions. The results confirmed this mediating effect, demonstrating that environmental concern is a critical psychological mechanism linking future-oriented cognition to career perceptions prioritizing sustainability. This finding is particularly relevant in emerging adulthood, a period characterized by identity exploration and the negotiation of complex social

roles, including professional roles [10]. Integrating environmental concern into career planning reflects emerging adults' growing commitment to addressing global challenges, demonstrating their evolution toward a broader, more inclusive perspective of their place in the world [22].

The multi-group analysis confirmed configural, metric, and scalar invariance across gender. These findings indicate that the hypothesized model holds consistently for both males and females, suggesting that the factor structure, the strength of the factor loadings, and the intercepts of the observed variables are equivalent across groups. This result supports the conclusion that the positive future thinking, environmental concern, and sustainable career constructs are conceptualized and measured similarly across genders. This reinforces the generalizability of the model and suggests that interventions aimed at promoting sustainable career development through future-oriented thinking and environmental concern may be equally effective across genders [65].

These findings contribute to a better understanding of the psychological pathways that promote sustainable career development in emerging adulthood. Specifically, this study highlights the role of emerging adulthood as a crucial stage for incorporating sustainability into personal and professional identities by integrating positive future thinking and environmental concern into a mediating framework. This is undoubtedly a significant contribution to broadening the sustainability debate, as it suggests that promoting positive cognitive frameworks during this developmental stage can enhance individuals' alignment with sustainability values and significantly influence their professional decisions. Therefore, this perspective contributes to the development of a more comprehensive understanding of sustainability as a multidimensional construct encompassing psychological, behavioral, and social dimensions that are particularly relevant to emerging adults as they define their identities.

From a practical perspective, these findings suggest that interventions to promote sustainable careers should take a developmental approach tailored to the specific needs of emerging adults. First, promoting positive thinking about the future can provide these individuals with an optimistic and confident view of the future, which serves as a cognitive resource for making informed career decisions. Second, raising environmental awareness during this critical period can reinforce sustainability-oriented career choices by encouraging emerging adults to align their career perceptions with broader environmental and social goals [31]. In light of these considerations, career counseling and training programs should integrate these elements, especially at this formative stage, to effectively guide emerging adults in their career development. For example, initiatives such as the "Guiding University Students Towards Sustainability" program [65] are well suited to enhance students' self-efficacy in planning sustainability-related careers in adulthood.

The findings of this study also have broader implications for the development of sustainable education and communities. Educational institutions that integrate future-oriented thinking and environment-based career guidance into their programs can play a key role in fostering the psychological resources identified in this study—namely, positive future thinking and environmental concern. Embedding these dimensions into educational curricula may enhance students' ability to envision meaningful and sustainability-oriented career paths, thereby reinforcing the aims of the Sustainable Development Goals. In fact, for university students, the time spent in higher education may serve as a precursor to career sustainability [66].

Similarly, sustainable communities promote a healthy environment, a prosperous economy, and social well-being [67]; participation in such communities may further reinforce the internalization of sustainability principles and support young people in making career choices aligned with environmental values. Therefore, both sustainable education

and sustainable communities may act as external enablers that strengthen the mechanisms identified in our model and amplify their long-term impact on career development.

These findings highlight the need for further research to explore these relationships across cultures and socio-economic contexts. In addition, future studies should employ longitudinal designs to establish causal pathways and examine potential moderating variables, such as cultural values, organizational support, or social norms, that may influence the strength of these associations among emerging adults. Although this study focused on environmental concern as a mediating factor, future research could benefit from investigating whether this variable may also play a moderating role, strengthening or weakening the link between positive future thinking and sustainable career perceptions under specific conditions. Moreover, additional constructs such as perceived support or social responsibility could serve either as alternative mediators or moderators. Examining the interplay of such variables would offer a more mechanistic understanding of the psychological and contextual processes that influence sustainable career development during emerging adulthood. Furthermore, these findings support the need to adopt a dynamic perspective that considers how cognitive, affective, and contextual variables interact to shape career development. Investigating these variables as part of an interconnected system may provide a broader conception of the psychological mechanisms underlying sustainability-oriented behaviors.

While this study offers valuable insights, it is not without limitations. Primarily, its cross-sectional nature precludes causal interpretations of the relationships observed. Future research should use longitudinal or experimental methods to further validate the proposed relationships, especially at different stages of emerging adulthood. Second, the sample consisted of Italian college students, which may limit the generalizability of the findings to other populations. Future studies should examine these associations in different cultural and socio-economic contexts to determine the extent to which these findings are valid for different groups of emerging adults. Third, although environmental concern was conceptualized as a mediator, other psychological factors, such as pro-environmental behaviors, social responsibility, or ecological identity, may also play an important role in shaping sustainable career perceptions. Exploring these additional mediators or potential moderators could provide a deeper and more detailed understanding of the mechanisms underlying sustainability-oriented career development in emerging adulthood. In addition, while environmental concern was conceptualized as a mediator in the present study, it may also function as a moderator under certain conditions. Future research should explore this possibility, as well as examine the roles of other psychological and contextual factors to better understand the complexity of influences on sustainable career perceptions.

6. Conclusions

In conclusion, this study provides empirical evidence on the mediating role of environmental concern in the relationship between positive future thinking and sustainable career perceptions among Italian emerging adults. The findings support the notion that, during emerging adulthood, an optimistic outlook on the future may partially guide professional choices toward sustainable goals through increased environmental awareness.

These results suggest that career development interventions targeting young adults may benefit from incorporating components that foster active reflection on both personal and collective futures, as well as promote environmental consciousness. However, given the study's reliance on a cross-sectional design and a sample limited to Italian participants, the practical implications should be interpreted with caution and further examined through longitudinal and cross-cultural research. Therefore, while preliminary, the theoretical and practical implications of this study point toward a promising direction of

integrating cognitive and value-based dimensions into sustainable career development models.

Furthermore, this study supports the achievement of specific Sustainable Development Goals (SDGs) by addressing key psychological drivers of sustainable development among youth. In particular, it contributes to SDG 4 (Quality Education) by promoting future-oriented life and career planning skills; to SDG 8 (Decent Work and Economic Growth) by fostering reflections on meaningful and sustainable career trajectories that promote decent work and economic growth; and to SDG 13 (Climate Action) by highlighting the role of environmental concern as a motivational factor in career decision-making. By integrating these dimensions, the study offers actionable insights for designing interventions that align personal development with global sustainability agendas.

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