



The Mechanism of Nature Connectedness in Reducing Academic Burnout Among Vocational English Major Students in China

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Abstract

The current research investigates how nature connectedness affects academic burnout and relevant mediating mechanisms of vocational English major students in China. All students were from a vocational college in eastern China: 600 students took part in the survey and 550 valid copies were collected. The focus of this research is on the relationship between nature connectedness and academic burnout along with the mediating roles of subjective vitality and ego depletion, and the moderating role of family SES. The findings indicate that: (1) nature connectedness negatively predicts academic burnout, with an increased level of nature connectedness leading to reduced academic burnout; (2) subjective vitality and ego depletion partially mediate the relationship between nature connectedness and academic burnout; (3) the path of influence is moderated by SES and the effect of nature connectedness on academic burnout is more pronounced among the students with higher SES. These findings contribute to the theoretical relevance of nature connectedness in educational psychology and have implications for a potentially low-cost and scalable intervention to reduce academic burnout in vocational education.

Keywords

Nature connectedness; academic burnout; vocational English major; subjective vitality; ego depletion

1. Introduction

With the rapid development of globalization, English, as an international lingua franca, has become increasingly important. In China, English education within the vocational education system plays an important role in cultivating highly skilled talents and enhancing national competitiveness. However, in recent years, vocational English major students have exhibited significant levels of academic burnout. This phenomenon not only severely impacts their academic performance but also hinders their skill development and future career prospects. Addressing academic burnout has become a key issue in vocational English education.

Academic burnout, as an important area of research in educational psychology, was initially applied to the study of workplace burnout. It is characterized by emotional exhaustion, depersonalization, and a reduced sense of personal accomplishment. Due to the unique academic characteristics and growth environments of vocational English students, they are more susceptible to academic burnout. Factors such as course difficulty, lack of learning interest, employment pressure, and societal expectations collectively contribute to a decline in enthusiasm for learning, which may lead to burnout.

Psychological health issues also increasingly affect this population. Vocational students, being in a critical stage of psychological development and personality formation, face not only academic burnout but also associated mental health issues, such as anxiety and depression. Exploring the psychological mechanisms to alleviate academic burnout and fostering positive psychological resources have thus become critical research areas in vocational education.

Nature connectedness, an important concept in environmental psychology, has been attracting increasing attention in recent years. It emphasizes the close relationship between humans and nature, with studies showing that individuals with higher levels of nature connectedness experience greater psychological calm and satisfaction. These positive psychological effects not only promote mental and physical health but also enhance performance in learning and daily life. Research indicates that nature connectedness significantly alleviates psychological stress, improves behavioral self-control, and enhances subjective well-being.

Despite abundant research on academic burnout, the focus has primarily been on university or secondary school students, with limited attention given to vocational students. Vocational English students, with their unique academic and psychological profiles, present a more complex case of academic burnout. Moreover, while the concept of nature connectedness has been explored in environmental and educational psychology, its relationship with academic burnout among vocational English students remains under-researched.

This study aims to address the following three key questions:

- (1) Does nature connectedness significantly affect academic burnout among vocational English major students?
- (2) Do subjective vitality and ego depletion mediate the relationship between nature connectedness and academic burnout?
- (3) Does family socioeconomic status (SES) moderate the path of influence between nature connectedness and academic burnout?

2. Literature Review

2.1 Current Research on Academic Burnout Among Vocational English Students

Academic burnout is an important concept in psychology, first introduced by Freudenberger (1974) to describe emotional exhaustion, depersonalization, and reduced personal accomplishment among professionals under chronic stress. It was later widely applied to the educational field (Maslach & Leiter, 1999). In China, vocational English students are particularly prone to academic burnout due to the dual challenges of academic pressure and limited career prospects. Compared to university students, vocational students often face weaker English foundations, lower motivation, and less external support, making academic burnout a critical factor affecting their academic performance.

Research on academic burnout focuses on three aspects: structural analysis of emotional exhaustion, behavioral disengagement, and reduced personal accomplishment; its influencing factors; and intervention strategies. Studies suggest that academic burnout is closely related to various factors, including academic pressure, learning motivation, and family support (Slivar, 2001). For example, excessive course requirements in vocational English programs increase academic stress, while lack of motivation exacerbates disengagement from English learning (Sharififard et al., 2020).

Recent interventions in academic burnout, such as mindfulness therapy and group counseling, have shown promising results (Su Kewen, 2019). However, traditional intervention strategies often incur high costs and yield short-term effects. In contrast, nature connectedness emerges as a unique psychological intervention approach, offering low-cost and long-term benefits (Yang Lixian, 2007).

2.2 Nature Connectedness and Its Impact on Learning Behavior

Nature connectedness describes the emotional attachment and sense of belonging individuals have with nature, forming a core concept in environmental psychology. It reflects the quality of the relationship between humans and the natural world (Mayer & Frantz, 2004). Research demonstrates that individuals with a higher degree of nature connectedness exhibit more positive mental health and behavioral outcomes (Kals, 1999). Nature connectedness has been shown to have significant effects on psychological health, cognitive functioning, and behavioral self-regulation (Nisbet, Zelenski, & Murphy, 2011). Firstly, exposure to natural environments effectively alleviates psychological stress and enhances overall well-being. For instance, viewing natural scenes can lower anxiety and increase positive emotions (Schwarz Müller-Erber et al., 2020). Secondly, nature connectedness improves cognitive abilities, particularly in terms of attention restoration and problem-solving skills (Kaplan, 1995). Lastly, it strengthens behavioral self-regulation, enabling individuals to better adapt to stressful situations (Leanne et al., 2019).

In the educational domain, nature connectedness positively influences learning behaviors. Studies have shown that students with higher nature connectedness exhibit greater academic motivation and learning efficiency (Bakir-Demir,

Berument, & Sahin-Acar, 2019). However, the role of nature connectedness among vocational English students has been underexplored. This study seeks to bridge this gap by integrating nature connectedness into the context of academic burnout in vocational education.

2.3 Subjective Vitality, Ego Depletion, and Family Socioeconomic Status

2.3.1 Subjective Vitality

Subjective vitality refers to the positive energy state individuals experience, characterized by feelings of vigor and dynamism (Ryan & Frederick, 1997). It is considered a critical psychological resource, closely associated with mental health, learning motivation, and well-being (Peterson & Seligman, 2004). In educational contexts, subjective vitality enhances learning engagement and focus (Schaufeli, 2002). For example, students with high vitality adapt better to classroom dynamics and actively engage with instructors, fostering a positive learning cycle (Jennifer et al., 2020). Conversely, when students face excessive academic pressure or unfulfilled psychological needs, their subjective vitality diminishes, increasing the likelihood of academic burnout (Ryan & Deci, 2008). This study examines subjective vitality as a mediating factor in the relationship between nature connectedness and academic burnout.

2.3.2 Ego Depletion

Ego depletion describes the state of diminished self-regulatory capacity resulting from prolonged tasks requiring self-control (Baumeister et al., 2000). Studies indicate that ego depletion leads to poor decision-making, impulsive behaviors, and reduced learning efficiency (Liese & Van den Bulck, 2018). In learning environments, ego depletion reflects the depletion of psychological resources due to sustained academic pressure. Students experiencing ego depletion are more likely to develop academic burnout (Ma Yu et al., 2020). Effective strategies to restore psychological energy include improving sleep and enhancing psychological detachment. However, these strategies often have limitations in implementation. Nature connectedness offers a novel perspective by rapidly restoring psychological resources through interaction with nature, reducing the risk of ego depletion.

2.3.3 Family Socioeconomic Status

Family socioeconomic status (SES) significantly influences students' academic performance and psychological well-being. Studies have shown that families with higher SES can provide richer learning resources and psychological support, thereby reducing the risk of academic burnout (Luo Yun, 2014). SES also plays a moderating role in various pathways of learning behavior. For instance, high-SES students benefit more from social support, while low-SES students face greater challenges due to limited psychological resources (Sharififard et al., 2020). In the context of nature connectedness, SES moderation is equally important. Higher SES students often have more opportunities to interact with nature, enhancing their sense of connectedness. Conversely, low-SES students may face barriers to accessing natural environments, limiting the psychological benefits of nature connectedness (Masashi et al., 2020). This study explores the moderating role of SES in the relationship between nature connectedness and academic burnout, aiming to identify differentiated impacts across SES levels.

3. Methodology

3.1 Participants and Sampling

This study targeted vocational English major students from a vocational college in eastern China. Using a cluster random sampling method, 600 students were selected from first-year to third-year cohorts. The sample included balanced proportions of gender, grade levels, and family socioeconomic status (SES). Due to the small number of male students in the English major, it was not possible to control the gender ratio at 1:1. The gender ratio of the selected participants was approximately 2:8 (female to male). To ensure the representativeness of the sample, the study included students with varying academic performance levels, family backgrounds, and urban-rural distributions.

3.2 Measurement Tools

This study employed structured questionnaires to collect data, which included the following core scales:

1) Nature Connectedness Scale

The Connectedness to Nature Scale (CNS) developed by Mayer and Frantz (2004) and revised into a Chinese version by Zhou Wenjun et al. (2013) was used. This scale consists of 14 items rated on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The internal consistency coefficient of the scale is 0.84, indicating good

reliability and validity. Sample items include "I feel that I am part of nature." The scale measured the participants' emotional and experiential connection to nature, yielding an overall connectedness score.

2) Academic Burnout Scale

The Academic Burnout Scale developed by Wu Yan and Dai Xiaoyang (2007) was used, containing 16 items across three dimensions: emotional exhaustion (4 items), academic disengagement (5 items), and reduced personal accomplishment (7 items). It uses a 5-point Likert scale from 1 (completely disagree) to 5 (completely agree). Sample items include "I feel overwhelmed by academic stress." The internal consistency coefficient is 0.86.

3) Subjective Vitality Scale

The Subjective Vitality Scale (SVS) developed by Ryan and Frederick (1997), adapted into a Chinese version by Tang Benyu (2005), was employed. After removing reverse-scored items, the scale includes six items rated on a 7-point Likert scale ranging from 1 (completely disagree) to 7 (completely agree). Sample items include "I feel energized and alive." The internal consistency coefficient is 0.79.

4) Ego Depletion Scale

Based on Baumeister et al.'s (2000) ego depletion theory, the Ego Depletion Scale revised by Xiao Chenjie et al. (2020) was used. This scale includes 20 items across three dimensions: emotional regulation, cognitive control, and behavioral inhibition, rated on a 5-point Likert scale. Sample items include "I find it difficult to persist in completing tasks." The internal consistency coefficient is 0.85.

5) Family Socioeconomic Status Questionnaire

A simplified SES questionnaire was used, assessing three dimensions: parental education level, family monthly income, and occupational category. Each dimension was rated on a scale, with higher scores indicating higher SES. The questionnaire has been widely applied in social background studies with good reliability and validity.

3.3 Data Collection and Analysis

3.3.1 Data Collection

Data were collected through a combination of online and offline surveys. Online surveys were conducted using the Wenjuanxing platform to ensure convenience and data security, while offline surveys were distributed and collected by the research team. Data collection spanned from March to April 2024. After strict examination of the completed questionnaires, including the removal of incomplete or abnormally completed responses, 550 valid samples were retained, resulting in a response rate of 91.67%.

3.3.2 Data Analysis

Statistical analysis was performed using SPSS 27.0 and the PROCESS macro, following these steps:

- 1) Descriptive Statistics and Correlation Analysis: To summarize the means, standard deviations, and correlations of the key variables, identifying basic relationships.
- 2) Regression Analysis: To examine the direct effect of nature connectedness on academic burnout.
- 3) Mediation Analysis: To assess the mediating roles of subjective vitality and ego depletion in the relationship between nature connectedness and academic burnout using the PROCESS macro.
- 4) Moderation Analysis: To test the moderating effect of SES on the influence of nature connectedness on academic burnout.

These steps aimed to uncover the psychological mechanisms underlying the relationship between nature connectedness and academic burnout while validating the proposed mediation and moderation models.

4. Results

4.1 Descriptive Statistics and Correlation Analysis

Descriptive statistics and correlations for the key variables—nature connectedness, academic burnout, subjective vitality, ego depletion, and SES—are presented in Table 1.

Table 1 shows that nature connectedness is significantly negatively correlated with academic burnout ($r = -0.52$, $p < 0.01$), indicating that higher levels of nature connectedness are associated with lower levels of academic burnout. Nature connectedness is significantly positively correlated with subjective vitality ($r = 0.61$, $p < 0.01$), suggesting that nature connectedness enhances students' subjective vitality. Additionally, nature connectedness is significantly negatively

correlated with ego depletion ($r = -0.44$, $p < 0.01$), meaning that students with higher nature connectedness experience less ego depletion. Academic burnout is significantly negatively correlated with subjective vitality ($r = -0.56$, $p < 0.01$), and ego depletion is significantly positively correlated with academic burnout ($r = 0.67$, $p < 0.01$), indicating a strong relationship between academic burnout and the depletion of psychological resources. Family socioeconomic status (SES) is significantly correlated with academic burnout, subjective vitality, and ego depletion, particularly with academic burnout and subjective vitality, suggesting that family background has a certain impact on students' academic performance and psychological health.

Table 1. Descriptive Statistics and Correlations

Variables	Mean	SD	Nature Connectedness	Academic Burnout	Subjective Vitality	Ego Depletion	SES
Nature Connectedness	3.85	0.76	1	-0.52**	0.61**	-0.44**	0.35*
Academic Burnout	3.21	0.85	-0.52**	1	-0.56**	0.67**	-0.45*
Subjective Vitality	4.15	0.72	0.61**	-0.56**	1	-0.49**	0.42**
Ego Depletion	2.85	0.91	-0.44**	0.67**	-0.49**	1	-0.36*
SES	3.25	1.02	0.35*	-0.45*	0.42**	-0.36*	1

*Note: * $p < 0.05$; ** $p < 0.01$.

4.2 Regression Analysis

Regression analysis was conducted to examine the direct effect of nature connectedness on academic burnout. The results are summarized in Table 2.

Table 2. Regression Analysis: The Direct Effect of Nature Connectedness on Academic Burnout

Predictor Variables	Academic Burnout (β)
Nature Connectedness	-0.52**
Subjective Vitality	-0.38**
Ego Depletion	0.45**
SES	-0.21*
R ²	0.47
F(5, 544)	92.34
p	< 0.001

*Note: * $p < 0.05$; ** $p < 0.01$.

Table 2 shows that nature connectedness has a significant negative effect on academic burnout ($\beta = -0.52$, $p < 0.01$), suggesting that students with higher nature connectedness experience lower academic burnout levels. Subjective vitality and ego depletion also significantly predict academic burnout, indicating their critical roles as intervening variables. The model explains 47% of the variance in academic burnout, reflecting strong predictive power.

4.3 Mediation Analysis

The mediating roles of subjective vitality and ego depletion in the relationship between nature connectedness and academic burnout were tested using the PROCESS macro (Hayes, 2013). The results are presented in Table 3.

Table 3 shows that subjective vitality significantly mediates the relationship between nature connectedness and academic burnout (indirect effect $\beta = -0.18$, 95% CI: [-0.24, -0.13]), suggesting that higher nature connectedness enhances

vitality, reducing burnout. Ego depletion also significantly mediates this relationship (indirect effect $\beta = 0.22$, 95% CI: [0.16, 0.29]), indicating that greater nature connectedness lowers ego depletion, which in turn alleviates burnout.

Table 3. Mediation Analysis of Subjective Vitality and Ego Depletion

Mediating Pathways	Direct Effect (β)	Indirect Effect (β)	Confidence Interval (95% CI)	Total Effect (β)
Nature Connectedness →	-0.38**	-0.18**	[-0.24, -0.13]	-0.56**
Subjective Vitality →	-	-	-	-
Academic Burnout		-	-	-
Nature Connectedness →	-0.30**	0.22**	[0.16, 0.29]	0.45**
Ego Depletion →		-	-	-

*Note: * $p < 0.05$; ** $p < 0.01$.

4.4 Moderation Analysis

To examine the moderating effect of SES, PROCESS macro was used. Table 4 summarizes the results.

Table 4. Moderation Analysis of SES in the Relationship Between Nature Connectedness and Academic Burnout

Predictor Variables	Academic Burnout (High SES)	Academic Burnout (Low SES)
Nature Connectedness	-0.45*	-0.68**
SES	-0.32*	-
R ²	0.39	0.52
p	< 0.05	< 0.01

*Note: * $p < 0.05$; ** $p < 0.01$.

Table 4 shows that SES significantly moderates the relationship between nature connectedness and academic burnout. For high-SES students, the negative effect of nature connectedness on burnout is moderate ($\beta = -0.45$, $p < 0.05$). For low-SES students, the effect is stronger ($\beta = -0.68$, $p < 0.01$). This suggests that nature connectedness serves as a more critical resource for low-SES students in mitigating academic burnout.

5. Discussion

5.1 Relationships Between Variables

This study reveals significant relationships among nature connectedness, academic burnout, subjective vitality, ego depletion, and family socioeconomic status (SES). These findings align with prior research and contribute new insights into the mechanisms underlying academic burnout among vocational English major students.

The negative correlation between nature connectedness and academic burnout supports previous findings (Mayer & Frantz, 2004; Schwarzmüller-Erber et al., 2020), demonstrating that a stronger connection to nature helps mitigate academic burnout. For vocational students, who face unique challenges such as weaker academic foundations and employment pressure, the psychological benefits of nature connectedness are particularly valuable. By fostering emotional stability and reducing stress, nature connectedness serves as an effective buffer against academic burnout.

Subjective vitality and ego depletion exhibit significant correlations with academic burnout. Subjective vitality, as a psychological resource, enhances students' capacity to engage with academic tasks, promoting motivation and focus (Ryan & Frederick, 1997). Conversely, ego depletion, which reflects diminished self-control resources, exacerbates the

risk of burnout when academic demands are high (Baumeister et al., 2000). The dual roles of these variables underscore the complex interplay between personal resources and external demands in shaping burnout outcomes.

The role of SES further highlights the importance of family background in influencing students' psychological resources and academic behaviors. Higher SES is associated with lower levels of academic burnout, likely due to the availability of greater support and opportunities for stress relief (Sharifard et al., 2020). Importantly, SES moderates the relationship between nature connectedness and burnout, with lower-SES students deriving more pronounced benefits from nature connectedness.

5.2 Psychological Mechanisms of Nature Connectedness

5.2.1 Direct Effects of Nature Connectedness on Academic Burnout

The regression analysis confirms that nature connectedness directly and negatively predicts academic burnout. This result underscores the inherent psychological benefits of nature connectedness, which include improved emotional regulation, enhanced stress recovery, and greater resilience (Kaplan, 1995; Nisbet, Zelenski, & Murphy, 2011). By fostering a sense of calm and satisfaction, nature connectedness alleviates the emotional and cognitive burdens associated with academic stress, thereby reducing burnout levels.

For vocational English major students, who often encounter additional stressors such as linguistic challenges and career-related anxieties, nature connectedness serves as a vital psychological resource. Institutions can capitalize on this by integrating natural elements into campus environments and educational practices, creating a supportive context that naturally alleviates burnout.

5.2.2 Mediating Roles of Subjective Vitality and Ego Depletion

This study confirms that subjective vitality and ego depletion partially mediate the relationship between nature connectedness and academic burnout. These findings provide empirical support for the energy restoration theory (Ryan & Deci, 2008), which posits that fulfilling basic psychological needs replenishes vitality and enhances performance. Nature connectedness facilitates this process by offering restorative experiences that renew psychological energy, thereby boosting subjective vitality and mitigating burnout.

Ego depletion operates as a contrasting mechanism. While academic demands deplete self-control resources, nature connectedness helps replenish these resources, reducing the likelihood of burnout. The dual mediation pathways highlight the multifaceted role of nature connectedness in sustaining psychological resources and reducing the impact of academic stress.

5.2.3 Moderating Role of Family Socioeconomic Status

The moderating role of SES further illuminates the contextual factors shaping the efficacy of nature connectedness. High-SES students benefit from greater access to natural environments and related resources, enhancing the effectiveness of nature connectedness in reducing burnout. Conversely, low-SES students, despite facing resource limitations, exhibit stronger responses to nature connectedness, suggesting that it fulfills an essential unmet need in this group. These findings align with previous research indicating that marginalized groups often derive greater benefits from accessible psychological resources (Masashi et al., 2020).

6. Conclusion

This study investigates the relationship between nature connectedness and academic burnout among vocational English major students, focusing on its underlying psychological mechanisms. The findings highlight the significant role of nature connectedness in alleviating academic burnout and the mediating effects of subjective vitality and ego depletion, as well as the moderating influence of family socioeconomic status (SES). The following conclusions can be drawn.

- 1) Nature connectedness significantly reduces academic burnout. Students with higher levels of nature connectedness experience lower levels of burnout, demonstrating the psychological benefits of fostering a strong connection to nature.
- 2) Subjective vitality and ego depletion partially mediate the relationship between nature connectedness and academic burnout. Nature connectedness enhances vitality and replenishes psychological energy, while reducing self-control resource depletion, ultimately alleviating burnout.
- 3) SES moderates the relationship between nature connectedness and academic burnout. While nature connectedness benefits all students, its effects are more pronounced among low-SES students, who may rely on it as a compensatory psychological resource.

Based on the research findings, this study offers the following recommendations for vocational English education from three perspectives: educational practice, family support, and social resources:

1) Enhance Nature-Based Education and Experiential Activities in Vocational Colleges

Vocational colleges should increase greenery and natural landscape designs on campus, such as creating green spaces, gardens, and ecological leisure areas, to make it easier for students to connect with nature. Additionally, nature-based experiences can be incorporated into the curriculum or extracurricular activities, such as outdoor hiking, ecological excursions, and nature-themed workshops. These measures will effectively strengthen students' sense of nature connectedness, alleviate academic pressure, and improve learning efficiency.

2) Using Nature Connectedness to Enhance Students' Psychological Energy

Schools can integrate nature-related themes into their mental health education programs. For instance, they can organize activities like nature photography competitions, gardening projects, and nature therapy experience courses to help students restore their psychological energy through nature connectedness. For English courses, ecological and cultural themes can be incorporated, with teaching materials focusing on topics like nature conservation and eco-tourism. This will not only stimulate students' interest in learning but also enhance their psychological vitality.

3) Strengthen School-Family Cooperation to Promote the Extension of Nature Education

Families are an essential support system for students' psychological well-being. Schools can work with parents through parent-teacher meetings and family education programs to raise awareness of the psychological benefits of nature connectedness. They should encourage parents to help their children engage with nature and foster emotional connections with it. Particularly during holidays, parents can make use of local resources to organize family-oriented nature exploration activities, helping students reduce academic stress and restore psychological energy.

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