

# Analysis of the Related Problems of Campus Green Space in Relieving College Students' Psychological Stress

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**Abstract:** This paper analyzes the problem of campus green space in relieving college students' psychological pressure. It discusses this issue from five aspects: the source of pressure, the significance of alleviating pressure, the theoretical analysis of how green spaces can relieve pressure, the principles to be followed when using campus green spaces to alleviate pressure, and the selection of appropriate green spaces. Furthermore, it examines the role of campus green spaces in alleviating pressure for college students and proposes methods and principles for utilizing green spaces to relieve pressure. The aim is to summarize and analyze recent developments and accomplishments in utilizing green spaces for stress relief, thereby further guiding research in this area.

**Keywords:** Campus green space; Environmental psychology; Landscape aesthetics; Landscape healing

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## 1. Introduction

Health represents the fundamental well-being and requirement of individuals, and it significantly contributes to shaping a positive national image. In recent years, the concept of a "Healthy China" has ascended to a strategic priority for both the Party and the nation. As society progresses and living standards improve, the importance of health is increasingly emphasized, particularly mental health. With the continuous expansion of colleges and universities driven by the national push for educational advancement, the student population has surged, making college students an indispensable segment of society. They serve as the stewards and creators of knowledge, vital agents in talent cultivation and dissemination, catalysts for cultural preservation and innovation, active participants in community engagement and service, and facilitators of international exchanges and collaboration. Their significant roles contribute immensely to societal progress and development. However, the mental well-being of college students presents a concerning picture. Research indicates that a substantial portion of college students in many countries grapple with mental and emotional challenges. The prevalence of examination-oriented education, rigorous academic demands, societal and familial expectations, intense

competition in the job market, the stress of transitioning to higher education, self-planning dilemmas, and interpersonal pressures collectively burden students with significant psychological stress, leading to negative emotional states such as anxiety and depression, which severely undermine their mental health <sup>[1]</sup>. Campus green spaces not only enhance the ecological quality and balance of the campus environment but also cultivate a healthy and pleasant atmosphere conducive to learning and living for both faculty and students <sup>[2]</sup>. Studies demonstrate that the presence of green spaces on campus promotes physical well-being, fosters self-awareness, alleviates psychological burdens, mitigates anxiety and depression, and reduces overall psychological pressure, thereby enhancing students' mental health.

## **2. Source of pressure**

In recent years, with the deepening of reform and opening up and the rapid development of the economy and society, significant changes have occurred in societal perspectives and living conditions, leading to difficulties in psychological adaptation and emerging psychological pressure. The modern pace of life has noticeably accelerated, demanding individuals to handle increasingly numerous responsibilities within limited time frames, consequently amplifying psychological pressure <sup>[3]</sup>.

As a distinct social group, college students undergo a pivotal transition from adolescence to adulthood, and their mental well-being is profoundly influenced by societal advancements. Common psychological pressures include academic pressure, employment pressure, and life pressure manifest in college students.

### **2.1. Academic pressure**

College students face escalating academic burdens primarily due to the proliferation of coursework. College-level courses are rigorous and extensive, necessitating significant time and energy investments to complete academic tasks. Managing copious course assignments, papers, and experiments contributes to the weight of academic obligations. Moreover, the evaluation of university learning predominantly relies on examination outcomes, directly impacting students' academic progression and future employment prospects. Consequently, the pursuit of high grades entails extensive review and preparation, further heightening study-related stress. Additionally, societal and familial expectations for academic excellence impose supplementary psychological pressure on students. Juggling multiple disciplines' learning tasks alongside social activities and part-time employment complicates time management, intensifying study-related stress. Furthermore, self-imposed demands and competitive pressures exacerbate academic stress, with some students setting lofty academic goals and contending with peer competition.

### **2.2. Employment pressure**

With societal development and intensified competition, the job market's competitiveness has escalated, subsequently augmenting employment pressure for college students. The burgeoning number of college graduates contrasts with the relatively limited job opportunities, fostering a supply-demand disparity. Particularly in sought-after industries and positions, fierce competition exacerbates the challenges of securing desirable employment. Additionally, deficiencies in professional skills and practical experience among some students hinder their competitiveness in job hunting. Moreover, a lack of career planning and goal clarity exacerbates employment pressure. Familial and societal expectations for stable employment and societal contribution further compound students' employment stress. Insufficient practical work experience upon graduation disadvantages students in the job market, as employers tend to favor candidates with relevant work experience. Furthermore, self-imposed demands for lucrative and promising careers clash with the uncertain job

market, intensifying students' anxiety and pressure regarding their future prospects.

### 2.3. Life pressure

College life necessitates forging relationships with peers from diverse backgrounds, which may pose challenges and social pressures for introverted or socially inept students. Additionally, concerns and anxieties about self-development and future prospects contribute to emotional stress. High tuition and living expenses impose financial strain, particularly on students from economically disadvantaged backgrounds. Emotional pressures stemming from romantic relationships, including relationship instability, breakups, and unrequited love, further compound students' emotional burdens. Moreover, the critical stage of self-identity and self-worth during adolescence triggers uncertainties and anxieties about identity, values, and future trajectories, intensifying psychological pressure.

**Table 1** presents the questionnaire survey results from other studies on college students' psychological stress sources.

**Table 1.** Source of pressure

Pressure source	Response [n (%)]	Percent of observed value
Learning problem	396 (21.9%)	63.4%
Employment and economic problems	456 (25.2%)	73.0%
Emotional problem	350 (19.3%)	56.0%
Social communication	392 (21.7%)	62.7%
Parental relationship	215 (11.9%)	34.4%
Total	1,809 (100.0%)	289.4%

### 3. The significance of stress relief

In contemporary society, individuals inevitably encounter various pressures in their work, studies, and daily lives, all of which can exert negative impacts on their physical and mental well-being. Consequently, the exploration of stress relief methods has become increasingly imperative. For college students, stress not only compromises their physical and mental health but also hampers their learning efficacy and future career prospects. Thus, the significance of stress relief has become increasingly pronounced.

When individuals experience pressure, they often find themselves fatigued both physically and mentally, thereby diminishing their overall quality of life. However, by moderating stress levels, individuals can regain the energy needed to confront life's challenges, thereby enhancing their quality of life. Moreover, stress relief fosters optimism and positivity, equipping individuals with better tools to navigate life's obstacles and adversities. Prolonged exposure to stress can precipitate negative effects on both physical and mental health, such as insomnia, anxiety, and depression. Effective stress relief mitigates the onset of these adverse emotional states, thereby preserving overall well-being.

Furthermore, stress relief enhances psychological resilience. Confronted with pressure, individuals must cultivate psychological resilience to effectively navigate life's myriad challenges. By engaging in stress relief practices, individuals can develop the necessary skills and confidence to confront stressors, thereby enhancing their adaptability to life's vicissitudes. Moreover, stress relief facilitates deeper self-awareness, thereby empowering them to leverage their abilities to the fullest extent.

## **4. Stress relief through green spaces**

In today's fast-paced modern life, stress is ubiquitous. Excessive stress not only affects individuals' physical and mental health but also diminishes quality of life. Therefore, it is crucial to identify effective methods for stress relief. Green spaces, as natural, ecological, and healthy environments, have gradually gained recognition and acceptance as effective stress relief mechanisms.

### **4.1. Theoretical basis of stress relief through green spaces**

Green spaces, as natural environments, provide an ambiance closely aligned with nature, fostering feelings of relaxation and comfort. Elements such as green plants, fresh air, and scenic landscapes within green spaces evoke tranquility and relaxation, effectively alleviating stress and enhancing psychological and physical well-being. Moreover, green spaces offer a sense of safety and comfort, further aiding in stress reduction and anxiety relief. By immersing oneself in greenery, individuals can experience the calming influence of nature, alleviating the pressures of daily life and rejuvenating the mind and body. Research indicates that green environments play a significant role in promoting psychological and physical health, aiding in anxiety reduction, mood enhancement, immune system strengthening, and even cardiovascular disease prevention. Additionally, the safety and comfort provided by green spaces allow individuals to lower their guard and feel nurtured by nature, facilitating further stress relief and anxiety reduction.

### **4.2. Characteristics of green space environments**

The characteristics of green spaces encompass various aspects:

(1) Green plants: Green plants serve as fundamental elements within green spaces, absorbing carbon dioxide, emitting oxygen, and enhancing environmental aesthetics, promoting a sense of tranquility and relaxation.

(2) Air quality: Green spaces typically boast superior air quality compared to urban environments due to the air-purifying capabilities of plants, contributing to a healthier atmosphere.

(3) Natural landscape: Natural features such as lakes, rivers, hills, and trees within green spaces offer aesthetic enjoyment and induce feelings of relaxation and comfort.

(4) Noise level: Green spaces typically exhibit lower noise levels than urban settings, providing a quieter and more peaceful environment conducive to stress relief.

### **4.3. Factors affecting stress relief in green spaces**

Key factors influencing stress relief in green spaces include the characteristics of the green space itself, its relationship with surrounding human settlements, and individuals' subjective perceptions. Since this paper focuses on green spaces within university campuses, the impact of surrounding human settlements can be somewhat diminished. Upon analyzing these factors, the characteristics of green spaces are further categorized into three aspects: inherent characteristics of green spaces, exposure to green spaces, and subjective perceptions of green spaces, as outlined in **Table 2**.



**Table 2.** The characteristics of green space itself, green space exposure, and green space subjective perception

Characteristics of green spaces	Classification description	Measure index	Conclusion
Own characteristics	Type	Types of landscape	Grasslands, woodlands, flower fields, and water bodies within campus landscapes can alleviate students' emotional anxiety and physical fatigue to some extent, with woodlands and water bodies having the most pronounced effects. Various landscapes offer diverse physical and mental recovery benefits, with productive landscapes yielding the most significant stress relief, followed by natural and artificial landscapes.
		Seasonal landscapes	Resilience and the inclination to visit are greater during summer compared to winter, with winter landscapes exhibiting notable gender differences.
	Patterns and structures	Naturality	The combination of artificial and natural elements provides the most effective environmental pressure relief.
		Plant community	Different plant communities offer varying stress relief effects, with lawn communities, arbor-shrub-grass communities, and arbor forests and grass communities providing distinct benefits.
		Green patch separation degree	Among forest landscape structures, semi-closed forest landscapes are most conducive to individuals' physical and mental health recovery, followed by open and closed forest landscapes.
		Biodiversity	The diversity of plant species influences stress perception recovery to a certain extent.
		Complexity	Riverside trails with high naturalization, abundant aquatic plants, and rest spaces offer significant stress relief benefits for young people.
	Quality	Divergence	For blue-green spaces, characteristics such as low blue visibility, high green visibility, enclosed top openings, and moderate complexity enhance spatial recoverability.
		Waterbody, topography, road network	Green spaces featuring water landscapes, natural terrain, and distance from roads and humanistic landscapes have a superior effect on attention recovery.
			Design strength
Exposure characteristics	Procurability	Acoustic environment	Birdsong significantly contributes to environmental healing, particularly in semi-open green spaces with high vegetation coverage and rich structure.
		Plant quantity	The inclusion of indoor green plants notably improves stress relief for the elderly, with an indoor environment containing low green content (6%) yielding the best results. Increased indoor plant presence and prolonged outdoor green space use lead to better self-assessment of health.
		Green vision exposure	Green visual exposure exerts the most significant influence on the self-rated health and mood of the elderly.
	Reachability	Per capita green area	In small urban green spaces, optimal stress relief and mood improvement occur when engaging in activities in environments with high per capita green areas and resting in environments with low per capita green areas.
		Green rate	The introduction of plants in the front gardens of residential buildings positively impacts stress recovery and happiness.
		Forest coverage density	The stress levels of men are negatively correlated with forest coverage density, while those of women show no significant correlation.
		Green space proportion	The duration of contact with green space negatively correlates with stress levels.
Sphere of influence	Straight-line distance	Proximity to community green spaces has the most significant impact on the life satisfaction of the elderly.	
	Sphere of influence	The effective intervention scope of Wuhan East Lake Greenway on nearby residents' health extends to 2 km.	

**Table 2 (Continued)**

Characteristics of green spaces	Classification description	Measure index	Conclusion
Subjective perception characteristics	Perceptibility	Perceptual attribute of green space	Features such as calmness, comfort, naturalness, shelter, species richness, and low social green space enhance stress recovery.
		Perceived duration of green space	Residents' average stress levels are negatively correlated with the average daily perceived duration.

The characteristics of green space primarily encompass its internal features, layout, related functions, internal landscape design, the coherence of auxiliary facilities, and species diversity, among other quality attributes. Existing research underscores the significant impact of green landscape types and naturalness on the psychological recovery of individuals. For instance, various natural landscapes exhibit distinct effects on alleviating psychological stress, with particular emphasis on the lawn's therapeutic effect.

The exposure characteristics of green space predominantly revolve around objective data indicators that influence people's interactions and utilization of green areas. These characteristics are typically divided into two aspects: availability and accessibility. Availability pertains to the provision and distribution of green space to individuals, often quantified through metrics such as green space quantity or density within a specific area, including statistical data such as greening rates, Normalized Difference Vegetation Index (NDVI), and forest coverage density. Accessibility is gauged by the proximity between green spaces and individuals, as well as the equitable distribution thereof.

Subjective perception characteristics of green space necessitate consideration of factors such as the layout, facility arrangement, species diversity, interactions with the surrounding environment, and individual perceptions and usage of green spaces. These factors collectively comprise the intricate mechanism through which green spaces contribute to stress relief. In specific research endeavors, this study explores the interplay between these factors through a combination of quantitative and qualitative analyses.

#### **4.4. The actual effect of green space in relieving pressure**

The effect of green space in alleviating stress is remarkable. Numerous studies have demonstrated that walking or sitting in green spaces can effectively reduce blood pressure, heart rate, and anxiety. Additionally, green spaces can improve immune system function and enhance physical resistance. Moreover, green spaces have been shown to uplift mood and mental state, leading to increased feelings of happiness and satisfaction. These effects are achieved through the natural environment and the safe and comfortable atmosphere provided by green spaces.

### **5. On the principles of campus green space in relieving stress and the choice of green space**

#### **5.1. Attention restoration theory (ART)**

Williams James emphasized the importance of focusing energy on essential yet uninteresting tasks to prevent distraction-induced errors <sup>[4]</sup>. This intense concentration can lead to neural fatigue <sup>[5]</sup>, which is remedied by shifting attention to objects or scenes of interest, as proposed in the Attention Recovery Theory (ART) <sup>[6]</sup>. This theory suggests that interacting with nature aids in mental relaxation and recovery <sup>[7]</sup>, countering urban stressors and restoring attention <sup>[8]</sup>. Human beings have an innate affinity for nature, making attention to and appreciation

of natural surroundings an effective method of relieving mental fatigue <sup>[9]</sup>.

## 5.2. Stress reduction theory (SRT)

The Stress Relief Theory (SRT), initially proposed by Roger Ulrich, explores the relationship between stress recovery and environmental landscapes <sup>[10]</sup>. According to this theory, individuals experiencing stress will undergo negative emotional and physical changes. However, exposure to natural environments can shift attention away from stressors (**Table 3**), mitigating these negative effects <sup>[11]</sup>. Artificial landscapes, in contrast, may impede stress relief. Subsequent discussions further delve into SRT, suggesting that prolonged concentration can lead to a decline in attention and negative consequences. However, interactions with nature, which do not necessitate concentration, can induce happiness and relieve stress <sup>[12]</sup>.

**Table 3.** The landscape features for effective stress relief

	Definition
Charm	When the environment is very attractive, users can naturally focus on the environment without deliberately asking for it, which is conducive to mental relaxation.
Degree	The environment should have enough multi-faceted structures and levels, and rich content can arouse people's attention for a long time, which is conducive to the rest of the brain.
Compatibility	The environment can provide users with more activities so that everyone can find their matching activities here.

Students' lives and academic performance are significantly influenced by the campus environment, including outdoor greenery, landscape types, naturalness, classroom views <sup>[13]</sup>, and restorative factors <sup>[14]</sup>. Various studies <sup>[15]</sup> have highlighted the role of outdoor environments, such as grasslands, woodlands, flower fields, and water bodies, in alleviating psychological pressure and anxiety among college students. Among these, green space and waterscapes stand out for their notable effectiveness.

## 6. The function of campus green space in relieving college students' stress

Compared to traditional public green spaces, campus green spaces enrich the campus landscape and enhance the humanistic atmosphere, positively impacting the physical and mental health of both teachers and students. Numerous studies have affirmed that campus greening contributes to students' overall well-being <sup>[16]</sup>, improving their self-awareness and stress relief, thereby optimizing their mental health <sup>[17]</sup>. Experiments by Roe and Aspinall have shown that being surrounded by greenery on campus evokes a sense of pleasure from nature, counteracting any potential feelings of depression. This natural environment allows students to immerse themselves in nature, experience joy, alleviate stress, and boost self-confidence, all of which are beneficial to their physical and mental health <sup>[18]</sup>.

Moreover, studies highlight that increased interaction with nature not only significantly enhances students' academic achievements <sup>[19]</sup> but also positively impacts their test scores <sup>[20]</sup>. Matsuoka's 2010 survey revealed that schools with more vegetation exposure boast better academic performance, graduation rates, and employment intention, while also experiencing reduced instances of criminal behavior among students <sup>[21]</sup>. Similarly, Tennessen and Cimprich's research suggests that exposure to beautiful campus environments increases student engagement, consequently improving their test scores <sup>[8]</sup>.

Given the significance of campus green spaces in meeting the needs of college students, it is imperative to thoroughly explore the various factors influencing their utilization of these spaces and how to increase their frequency of use. The campus environment plays a vital role in the growth and development of college students,

servicing as the cornerstone of their academic journey and providing them with a solid foundation. Consequently, the design of campus green spaces is of paramount importance, ensuring that they are conducive to students' studying, relaxation, and recreation.

## 7. Conclusion

In conclusion, campus green spaces play a significant role in alleviating students' psychological pressure. Therefore, colleges and universities should prioritize the function and effectiveness of green space as a means of psychological recuperation for students. By doing so, they can promote the all-round physical and mental development and health of students.

## Disclosure statement

The authors declare no conflict of interest.

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