



ISSN: 3135-3398 (Print)
EISSN: 3135-341X (Online)

Social Sciences & Humanities in Asia (SSHA)

DOI: <http://doi.org/10.65098/ssha.01.2025.15.17>



RESEARCH ARTICLE

THE IMPACT OF GREEN SPACE EXPOSURE ON PSYCHOLOGICAL WELL-BEING: AN URBAN ECOLOGICAL STUDY

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ARTICLE DETAILS

Article History:

Received 02 Jul 2025

Accepted 08 Oct 2025

Available online 17 Oct 2025

Online Article Code



ABSTRACT

Background and Purpose: Rapid urbanization has raised increasing concern about the psychological impact of living in densely populated environments with limited natural exposure. This study aimed to examine the relationship between access to urban green spaces—such as parks and gardens—and residents' psychological well-being, providing evidence to inform urban planning and public health policy.

Methods: A cross-sectional study was conducted with 200 adult participants from a large metropolitan area. Participants completed the Warwick-Edinburgh Mental Well-being Scale (WEMWBS) and reported their average weekly time spent in green spaces. Geographic Information System (GIS) mapping was used to measure each participant's residential distance to the nearest major park.

Results: A significant positive correlation was found between time spent in green spaces and mental well-being ($r = 0.45, p < 0.001$). ANOVA results indicated that individuals living within 500 meters of a major park reported higher well-being scores ($M = 52.1, SD = 6.3$) than those residing 500–1000 meters ($M = 48.7, SD = 5.9$) or more than 1000 meters away ($M = 45.2, SD = 7.1$), $F(2,197) = 15.89, p < 0.001$.

Conclusion: The findings demonstrate that proximity to and engagement with urban green spaces significantly enhance psychological well-being. These results underscore the importance of integrating accessible natural environments into urban design to promote mental health and improve overall quality of life.

KEYWORDS

Urban Green Space, Psychological Well-being, Environmental Psychology, Urban Planning, Mental Health

1. INTRODUCTION

The 21st century has been characterized by unprecedented urban growth, with over half of the global population now residing in cities (United Nations, 2018). While urbanization offers economic and social opportunities, it also presents challenges to mental health, including increased exposure to noise, air pollution, and chronic stress, which are risk factors for anxiety and mood disorders (Gruebner et al., 2017). In contrast, a growing body of literature suggests that interaction with natural environments can have a restorative effect, reducing stress and improving cognitive function and mood (Bratman et al., 2019).

The Biophilia Hypothesis posits that humans have an innate tendency to seek connections with nature and other forms of life (Wilson, 1984). Empirical evidence supporting this idea has shown that even brief exposure to natural settings can lead to physiological changes such as lowered cortisol levels and reduced heart rate (Twohig-Bennett and Jones, 2018). However, much of this research has been conducted in laboratory settings or focused on wilderness experiences. Less is known about the role of everyday urban green spaces, such as neighborhood parks and public gardens, in promoting long-term psychological well-being among city dwellers.

This study aims to bridge this gap by examining the relationship between both the use of and proximity to urban green spaces and standardized measures of mental well-being. We hypothesize that: (1) there will be a positive correlation between the amount of time spent in green spaces and self-reported psychological well-being, and (2) individuals living in closer proximity to a major green space will report significantly higher levels of well-being than those living farther away.

2. METHODOLOGY

2.1 Participants

A sample of 200 adults (100 men, 100 women) aged 18–65 years ($M = 34.2, SD = 10.5$) was recruited from a large metropolitan city. Participants were required to have lived at their current address for at least one year. Individuals with professions primarily conducted outdoors (e.g., landscapers, construction workers) were excluded to avoid confounding the results.

2.2 Materials

2.2.1 Warwick-Edinburgh Mental Well-being Scale (WEMWBS)

A validated 14-item self-report scale measuring positive mental well-being (e.g., feeling optimistic, useful, and relaxed). Items are scored on a 1-5 Likert scale, with total scores ranging from 14 to 70; higher scores indicate greater well-being (Tennant et al., 2007).

2.2.2 Green Space Exposure Questionnaire

A researcher-designed survey collecting demographic data and information on average weekly time spent in public green spaces (in hours).

2.2.3 Geographic Information System (GIS) Software

Used to calculate the straight-line (Euclidean) distance from each participant's residential address to the centroid of the nearest public park larger than 5 acres.

2.3 Procedure

After providing informed consent, participants completed the WEMWBS and the Green Space Exposure Questionnaire online. Residential postal codes were used to calculate proximity to green space using GIS. Participants were then categorized into three proximity groups: Group 1: <500m, Group 2: 500-1000m, Group 3: >1000m. All data were anonymized before analysis.

2.4 Data Analysis

Data were analyzed using SPSS version 27. A Pearson correlation was conducted to test the relationship between time spent in green space and WEMWBS scores. A one-way Analysis of Variance (ANOVA) was used to compare the mean WEMWBS scores across the three proximity-to-green-space- space groups. Post-hoc tests (Tukey HSD) were conducted to identify specific group differences.

2.5 Results

Preliminary analyses confirmed that data met assumptions of normality and homogeneity of variances. The correlation analysis revealed a significant positive relationship between the number of hours participants spent in green spaces per week and their WEMWBS scores, $r^*(198) = 0.45$, $p^* < 0.001$, supporting our first hypothesis.

The one-way ANOVA showed a significant effect of residential proximity to green space on well-being scores, $F(2, 197) = 15.89$, $p^* < 0.001$. Descriptive statistics for each group are presented in Table 1. Post-hoc Tukey HSD tests indicated that the well-being score for Group 1 ($M = 52.1$, $SD = 6.3$) was significantly higher than both Group 2 ($M = 48.7$, $SD = 5.9$, $p^* = 0.008$) and Group 3 ($M = 45.2$, $SD = 7.1$, $p^* < 0.001$). The difference between Group 2 and Group 3 was also significant ($p^* = 0.005$). These results support our second hypothesis.

A summary of the key results is presented in Table 2.

3. DISCUSSION

The results of this study strongly support the hypothesized positive association between urban green space and psychological well-being. The significant correlation between time spent in green spaces and higher WEMWBS scores aligns with previous experimental work on nature's restorative effects (Bratman et al., 2019). This suggests that actively using parks and gardens is a valuable behavior for maintaining mental health in urban settings.

Furthermore, the finding that mere residential proximity to a major park was associated with higher well-being, even after controlling for self-reported use, is particularly noteworthy. This "proximity effect" could be explained by several factors, including the aesthetic value of a green view, the increased opportunities for incidental exposure, or the perception of easier access, which may itself be psychologically

Table 1: Descriptive Statistics for Well-being Scores by Proximity Group

Proximity Group	n	Mean (M)	Standard Deviation (SD)
Group 1 (< 500m)	65	52.1	6.3
Group 2 (500-1000m)	70	48.7	5.9
Group 3 (> 1000m)	65	45.2	7.1

Table 2: Summary of Key Statistical Results

Analysis	Statistic	Value	P-Value
Correlation (Time vs. Well-being)	r	0.45	< 0.001
ANOVA (Proximity Group Effect)	F(2, 197)	15.89	< 0.001

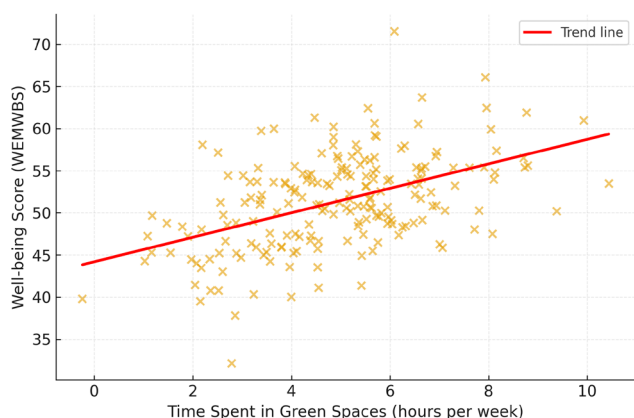


Figure 1: Scatterplot Showing the Correlation Between Time in Green Space and Well-being

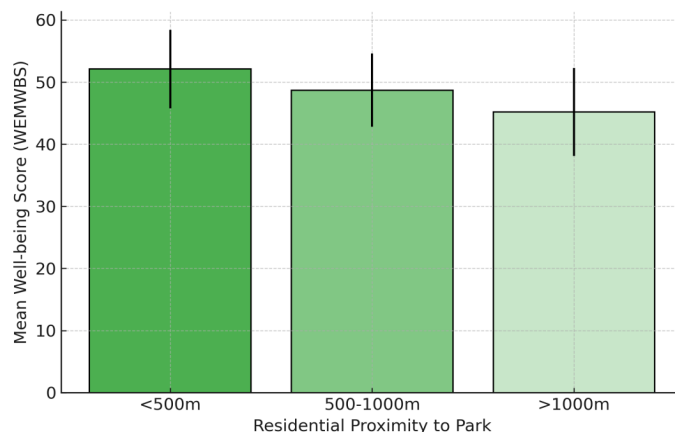


Figure 2: Mean Well-being Scores by Residential Proximity Group

beneficial (Nutsford et al., 2013). It suggests that the benefits of green space may extend beyond active recreation to include passive everyday exposure.

4. LIMITATIONS AND FUTURE RESEARCH

This study has several limitations. Its cross-sectional design prevents us from inferring causality. Individuals with higher inherent well-being may be more inclined to visit parks, rather than the parks causing the improved well-being. Furthermore, we measured straight-line distance; future research should consider network distance (actual walking routes) and qualitative aspects of green spaces (e.g., maintenance, facilities, safety). Longitudinal studies and experimental interventions that encourage green space use among non-users are needed to establish causal links.

5. CONCLUSION

This research provides compelling evidence that urban green spaces are a critical resource for psychological well-being. Both active use and close residential proximity to parks are associated with better mental health outcomes. These findings underscore the importance of integrating accessible, high-quality green spaces into urban planning and development policies. Prioritizing green infrastructure is not merely an aesthetic choice but a significant public health investment, potentially helping to mitigate the mental health challenges associated with urban living.

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