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Original
Reinventing Urban Public Space from the Perspective of Female / Hu, R., Song, X., Liu, Y., Song, Y.. - In: SPACE INTERNATIONAL JOURNAL OF CONFERENCE PROCEEDINGS. - ISSN 2977-814X. - ELETTRONICO. - 4:2(2024). [10.51596/sijocp.v4i2]

Availability:
This version is available at: 11583/2998418 since: 2025-03-20T09:23:19Z

Publisher:
SPACE Studies Publications

Published
DOI:10.51596/sijocp.v4i2

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(Article begins on next page)

26 November 2026

ISSN: 2977-814X
ISSUE DOI: https://doi.org/10.51596/sijocp.v4i2
Volume 4 Issue 2
journal.spacestudies.co.uk

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To cite this article:

Hu, R., Song, X., Liu, Y., & Song, Y. (2024). Reinventing Urban Public Space from the Perspective of Female. SPACE International Journal of Conference Proceedings , 4(2), 1–8. https://doi.org/10.51596/sijocp.v4i2.63

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OPEN ACCESS

ISSN: 2977-814X
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Article History:
Received May 24, 2024
Accepted August 19, 2024
Published Online December 16, 2024

https://doi.org/10.51596/sijocp.v4i2.63

Abstract

As society advances, many women in urban areas still feel insecure and fearful when using parks, squares, and car parks despite recognising women's rights and freedom of access to public spaces in many countries. In addition, the lack of equal opportunities and encouragement for girls in outdoor activities leads to their absence and self-limitation in public spaces. These realities highlight the inadequacy of most urban public spaces in meeting women's psychological and behavioural needs and require more attention and improvement from architects and urban planners. This paper examines the development and evolution of the morphology of urban public space from a female perspective, using typomorphology, environmental behaviour, and psychology approaches. It aims to classify and integrate typomorphology according to women's psychological and behavioural preferences and to explore the links between typomorphology and politics, society, economy, and women's psychology and behaviour. The study aims to provide comprehensive data for urban design and strategies so that redesigned urban public spaces can adequately meet the needs of women of different ages, sexual orientations, races, classes, and identities. Such spaces will be more inclusive, friendly, attractive, and comfortable, providing theoretical guidance for global urban public spaces' future.

Keywords: Typomorphology, urban public space, gendered space, environmental behaviour, environmental psychology

1. Introduction

Cities were initially designed to serve men. The initial European and American urban planning was more inclined to meet the needs of men, which was reflected in aspects such as moving residential areas away from factories and creating a more liveable suburban environment. This

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kind of planning has led to a close connection between the city and men and created a gap that must be addressed between the city and the suburbs and between men and women (Kern, 2021). Historically, the city's power structure has been imbalanced, and the design of urban public spaces has yet to consider women's physical characteristics and their needs entirely, which are often ignored.

With the emergence of the modern feminist movement and feminist thought, the concept of equality between men and women has gradually become popular, and the social status of women has undergone earth-shaking changes. However, urban construction needs to be faster to keep up with this pace of change and still needs to provide buildings and services that meet women's needs. Some urban planning experts and architects have begun to call for the goal of urban construction to serve everyone, not just men (Franck and Paxson, 1989).

In contemporary society, the issue of women's safety in urban spaces has increasingly attracted public attention, which links gender identity, urban development, and spatial justice. However, the rational functionalism prevalent in modern architectural concepts ignores the diversity of space (Kutsche,1962), which contrasts the core concept of feminism that focuses on gender differences. Postmodern architectural concepts emphasise that indifference to the modern spatial environment neglects women's characteristics and rights.



Figure 1. Protest outside Penn Station against government demolition of the station. (Source: David Hirsch, 1962)

With the improvement of social civilisation and economic development, women's economic income and educational level have continued to increase, and their status in the family and society has also been greatly improved. Therefore, women are spending more and more time participating in various outdoor activities. Under the trend of diversified space demands, urban design that pays more comprehensive and extensive attention to human nature is needed (Huang,2008).

As cities evolve and strive for inclusivity, it becomes imperative to address the historical gender biases embedded within urban planning and design. Efforts to bridge the gap between men and women in urban spaces must involve reevaluating traditional planning paradigms and adopting gender-sensitive approaches. Integrating feminist perspectives into urban design can facilitate the creation of more equitable and accessible environments for all genders.

Furthermore, urban spaces should be designed to accommodate women's diverse needs and experiences, recognizing their contributions to the social and economic fabric of cities. This entails reimagining public spaces as inclusive, safe, and empowering environments where women can fully participate in civic life. By prioritizing gender equity in urban development, cities can foster

social cohesion and enhance the quality of life for all residents.

In conclusion, achieving gender-inclusive urban spaces requires a holistic approach that addresses structural inequalities and embraces diverse perspectives. By incorporating feminist principles into urban planning and design, cities can move towards a more just and equitable future where women's voices are heard, valued, and reflected in the built environment.

2. Full Spectrum of Women: Perspectives from Biology and Sociology

In gender studies, we usually define gender from two perspectives: social (gender) and biological (sex). This study not only looks at traditional heterosexual white women but also includes queer, transgender women, black people and other groups who are biologically or psychologically classified as female. Therefore, our research subjects cover members of different ages, identities, and races. Faced with such a diverse group of people, we inevitably have to think about a question: Is our city friendly to everyone? Is this bottom-up planning process truly inclusive of all city residents? Is our cultural and social diversity adequately protected (Little and Richardson, 1988)?

This study will focus on strategies and design methods that help achieve urban inclusion goals globally, emphasise the responsibilities and roles of all participants in public space, and focus the scope of public space research on parks, squares, outdoor recreation sports venues and other areas. Currently, in many cities worldwide, women lack a sense of security or even fear using public spaces (Valentine, 1990). At the same time, girls do not receive equal opportunities and encouragement in designing and using outdoor sports venues. Instead, they have fewer opportunities to participate in sports activities. Decreasing day by day (Zhou Peiqin, 2013).

3. Towards a Complete Theoretical Framework of Urban Design from a Female Perspective

Research on gender space theory has attracted increasing attention, especially in Western societies, where research on women and space is mainly concentrated in geography, planning, and architecture. Research in geography focuses on gender inequality in urban space; planning focuses on criticising planning theories and revising urban policies. In contrast, architecture focuses on female elements in architectural design and feminine urban intentions. Despite the existence of these studies, most practices remain limited to small-scale and discrete explorations and need to be more widely recognised. Among them, the study of feminist space criticism included three essential books in the 1980s: Making Space: Women and the Man-made Environment (1984), which focused on space design and focused on Practical design research; Geography and Gender: An Introduction To Feminist Geography, which attempts to establish a feminist research framework on a larger scale (Sharp, 2009); Women in Cities: Gender and the Urban Environment focuses on case studies in cities from aspects such as employment, housing, transportation, leisure, community organisations, and children's schooling(Little and Richardson, 1988). There is also a book, Discrimination by Design: A Feminist Critique of the Man-Made Environment, which emphasises particularly the relationship between the control and use of space and gender social rights and proposes feminist strategies related to space. This dimension is often ignored when discussing the relationship between space and society at the theoretical level (Weisman, 1994).

On the other hand, women's social space has experienced a long development in history. From ancient society to contemporary society, the shape of social space has undergone tremendous changes. In this process, choosing to use typomorphology to study the evolution of urban public spaces is of great significance. Typomorphology combines the advantages of morphology and typology to better understand the evolution of urban form and provide guidance for future urban renewal and design. The research methods of typomorphology mainly involve the analytical and conceptual cognitive framework of morphology and the evolutionary perspective of typology. By comprehensively analysing the characteristics of building types and ground plane types and tracking the evolution of morphological types over time, the complexity and diversity of urban form can be better understood (Whitehand, 2014). This approach helps to understand the historical characteristics of urban form and guides the practice of urban planning and design.

In recent decades, the research on morphological typology has gradually entered a stage of comprehensive development involving theoretical construction, case studies, and planning practice. The application of typomorphological analysis methods can provide an essential reference for urban planning and design, especially in the planning and preparation of historic urban areas and new areas. However, only a partial urban design theory guides the design of future urban public spaces from a female perspective. The combination of typomorphology and gender space research theory has great potential, so this study aims to explore the theory. Explore and form a complete theoretical framework to guide the design of urban public spaces.

4. Towards a Complete Theoretical Framework of Urban Design from a Female Perspective

After feminist thought first appeared in urban space research in the 1970s, the influence of feminism gradually spread to the field of architecture. The publication of essay collections such as Sexuality & Space and Architecture and Feminism in the 1990s marked the emergence of interdisciplinary research on architecture and feminism.

This study will investigate the relationship between women's groups and public space, exploring an intertwining discipline of urban design, morphology, typology, and gender studies. Focus on women's interests and strategies to shape urban public spaces (Li, 2003).

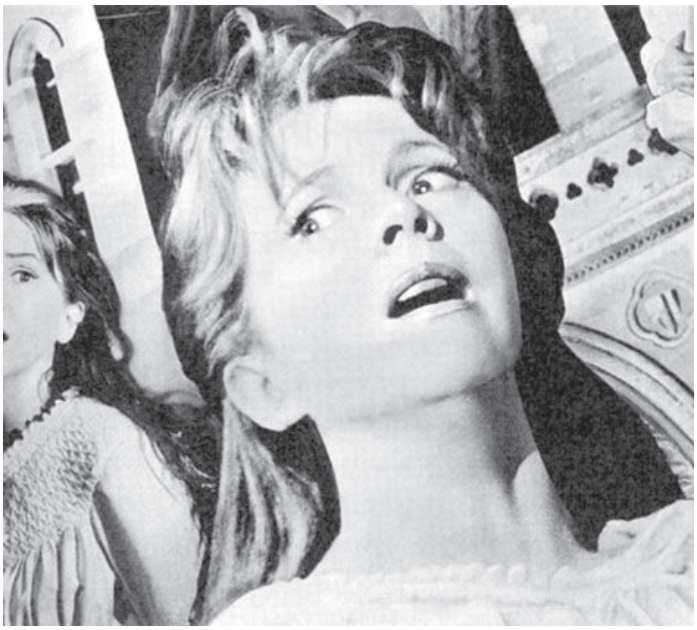

Figure 2. The Haunting; above: Joan Bennett in the film Secret Behind the Door. (Source: Colomina, 1992)

First, this study is committed to using the first potential of typomorphology to explore the similarities and differences in the forms of social public spaces when women in different historical periods occupy different social positions in society (Trisciuoglio, 2021). Secondly, this study will also use the second potential of typomorphology and combine it with environmental psychology and environmental behaviour to research contemporary women, summarise and collect the locations of contemporary urban public spaces that women love and hate, and analyse these conduct comparative studies on regional spatial forms, thereby providing a spatial carrier for the implementation of urban form management (Chen, 2010).

Finally, this study will be committed to using the third potential to investigate those model cities that are friendly to women and analyse the internal structural characteristics and historical evolution rules of the generation process of their formation process of form thereby providing information for urban planning and design—a complete "index" of house building guidance (Gugliotta and Trisciuoglio, 2022). In Vienna, more than 60 pilot projects on "gender mainstreaming" have been carried out so far, and gender mainstreaming has become an essential driving force for urban

change. Among them, Eva Kehl designed an apartment building called “Women-Work-City” in Vienna, which has 357 residential units and is close to public transportation stations. Each apartment building floor has stroller storage areas and ample open space for children to play. The apartment building also has a kindergarten, a pharmacy, and a community doctor’s office. The height of the building had to be low enough to ensure that the women living in it could see the street. At the same time, the apartment was very close to public transportation. These design details were designed with women’s safety in mind.



Figure 3. Frauen-Werk-Stadt is the first gender-sensitive housing project designed by women in Vienna, Austria. (Source: Frauen-Werk-Stadt.1997)

Environmental behaviour and environmental psychology have essential reference values for thinking about people’s behaviour in space and how to consider the construction of spatial patterns. The results of female psychology research show apparent differences in women’s perception compared with men. Donald Appleyard (1976) found that men’s cognitive maps are more precise and extensive than women’s. Women are more spatially oriented than men, which is attributed to men’s greater exposure to cities; a research report by Abu-Obeid (1998) pointed out that men are more aware of new environments. Quick. Related experiments by McGuinness and Sparks (1979) pointed out that women organize spatial terrain by grouping landmarks and establishing distances between them, whereas men are likelier to start with a network of paths and channels. Other studies have shown that women’s cognitive maps are generally as accurate as men’s, but women place more emphasis on neighbourhoods and curbs, while men pay more attention to path structure. This difference in perception will inevitably lead to behavioural and psychological differences, which provides a theoretical basis for exploring women’s behavioural and psychological characteristics. To study women’s behavioural and psychological characteristics, scientific research methods need to be adopted, including two significant systems: survey method and analytical method. The survey method is used to collect data; the analytical method is to analyse the collected data to conclude consistent with the results. Logical explanation: the investigation methods used in the research process include the literature survey method, action observation method, SD method, behaviour labelling method, and moving line observation method; the analysis methods used include data statistics method, plane drawing method, comparison method, and factor analysis method (Xu,2004). Using these methods to collect data on women’s psychology and walking routes in urban public spaces, we can summarise the geographical locations of urban public spaces that women love and dislike and provide research cases for studying typological morphology.

5. We Still Have a Lot to Do

The innovations of this article are: first, interdisciplinary research. This article uses the methods of urban morphology and building typology, combined with female psychology and female behaviour, to research urban space design. Since the 1950s, Conzen’s urban morphology and Caniggia’s building typology have formed two primary schools. It was not until the 1980s that

urban morphology and building typology were combined to form typomorphology. However, these theories are mainly used for historical architectural preservation and urban regeneration, focusing mainly on the evolution of urban form and building types and the political, economic, and cultural factors behind them, with less consideration of human behaviour and psychology. To study the design of urban spaces related to women, women's detailed psychological and behavioural changes must be considered. Therefore, this study supplements the theory of typological morphology by combining it with psychology and behaviour. It explores urban spaces suitable for women and the reasons behind them to provide references for more cities.

Second, a new definition of women. This article goes beyond traditional definitions of women to include not only biological women but also psychological women. The research subjects are not limited to women but also include queer people. Therefore, this article not only designs urban spaces for women's groups but also provides design solutions for queer groups.

Future research directions will focus on cross-cultural comparative research and select different types of urban areas worldwide to research morphology and architectural types. The scope of the study is not limited to European countries but also includes countries in Asia and the Middle East that have different tolerances for women. Through cross-cultural comparative research, we can more clearly explore the characteristics of urban forms and building types that are friendly to women, as well as the characteristics of urban forms and building types that are unfriendly to women, to find out the motivations and laws behind them, and provide a basis for exploring the local Women-friendly urban spaces provide evidence.

The shortcoming of this article is that no actual case study has been conducted, and only the theoretical feasibility has been stated. We want to combine typomorphology with environmental psychology and behaviour for urban space research. In that case, we need to collect historical data, conduct extensive interviews with women, record behavioural routes, and quantify these contents to lay a more scientific foundation. The basis of the design plan. Achieving this goal requires the joint efforts of many scientific researchers, and we still have much work to do.

6. Conclusion

In planning and constructing urban spaces, a gender perspective is crucial as it seeks to incorporate cultural diversity as a critical factor in new approaches to urban planning and urban design. This article proposes ideas for achieving a female-friendly and inclusive approach based on this perspective. A vision for urban public space, driven by the understanding of women's diverse needs and experiences, emerges as a cornerstone for creating truly inclusive environments. It also discusses and summarizes the research results of women-related spaces, emphasizing the importance of acknowledging women's multifaceted roles and contributions in shaping urban landscapes. To delve deeper into understanding the relationship between gender and urban space, the study advocates integrating typomorphology with research theories of female psychology and behaviour. By examining urban forms and architectural types through a female lens, the evolution of spatial configurations and their impact on gender dynamics can be explored comprehensively. This interdisciplinary approach enriches urban design theory and offers practical insights into creating inclusive spaces catering to diverse gender needs and experiences.

Typomorphology emerges as a pivotal methodological framework in this endeavour. It represents a synthesis of typology and morphology, offering a nuanced understanding of urban form and its socio-cultural implications. Through typomorphological analysis, researchers can decipher the underlying structures and patterns that influence the spatial experiences of female groups. This deeper understanding informs the development of more context-sensitive and inclusive urban interventions.

In general, the key to how women can obtain "security," comfort," and "sensibility" in the use of urban public spaces lies in the recognition of gender-specific needs and experiences. Rather than adhering rigidly to abstract principles or standards, urban design should be responsive to the diverse needs of all citizens, including women.

Acknowledgements

Thanks to Professor Marco Trisciuoglio for his guidance and help.

Conflict of Interests

No potential conflict of interest was reported by the author(s).

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Hu Ruotong is a PhD candidate at Politecnico di Torino. Her doctoral research is in urban design and urban morphology. She participated in the 30th 'Conference of the International Seminar on Urban Form: Praxis of Urban Morphology' as a co-author in 2023, and the title of her paper is 'An Expanded Concept for Playground as an Element in Urban Form'.

Song Xinxin is a PhD student at the Spatial Relations Laboratory of the University of Florence. Her research direction is the sustainable contribution of urban agriculture. She has participated in the 2nd International Conference on "Trends in Architecture & Construction" (ICTAC-2024) and her topic was 'Analysis of the development process and future trends of Community Garden'.

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Song Yunzi is a postgraduate student at Politecnico di Torino. The postgraduate major is sustainable architecture. She has published a paper as a co-author, and her paper's title is 'Improvement Strategies Study for Outdoor Wind Environment in a University in Beijing Based on CFD Simulation'.

Endnotes

This paper has been presented at the SPACE International Conference 2024 on City Planning and Urban Design.

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