

**THE INFLUENCE OF PERSONAL, SOCIAL AND  
PHYSICAL ENVIRONMENT FACTORS ON  
SOCIAL INTERACTION OF OLDER ADULTS IN  
URBAN PARKS, ANYANG, CHINA**

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**UNIVERSITI SAINS MALAYSIA**

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PHYSICAL ENVIRONMENT FACTORS ON  
SOCIAL INTERACTION OF OLDER ADULTS IN  
URBAN PARKS, ANYANG, CHINA**

by

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## LIST OF ABBREVIATIONS

WHO	World Health Organization
UN	United Nations
EG	Environmental Gerontology
SEM	Socio-ecological Model
SDG	Sustainable Development Goals
P-E	Person-Environment
ETA	Ecological Theory of Aging
KMO	Kaiser-Meyer-Olkin
SPSS	Statistical Package for the Social Sciences
IBM	International Business Machines Corporation
ANOVA	Analysis of Variance
M	Mean
SD	Standard Deviation
TA	Target Area
SC	Social Cohesion
SS	Social Support
SOB	Sense of Belonging
FEA	Features
CON	Conditions
AES	Aesthetics
SAF	Safety
ACC	Accessibility
IV	Independent Variables
DV	Dependent Variables
SIF	Social Interaction Frequency
SIL	Social Interaction Level
VIF	Variance Inflation Factor
LLCI	Lower Level Confidence Interval
ULCI	Upper Level Confidence Interval
S.E.	Standard Error
USM	Universiti Sains Malaysia

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**PENGARUH FAKTOR PERIBADI, PERSEKITARAN SOSIAL DAN  
FIZIKAL TERHADAP INTERAKSI SOSIAL ORANG DEWASA TUA DI  
TAMAN BANDAR, ANYANG, CHINA**

**ABSTRAK**

Dengan peningkatan penuaan populasi global, kesihatan dan kesejahteraan warga tua telah menjadi tumpuan utama masyarakat. Taman-taman bandar memainkan peranan penting dalam reka bentuk dan pengurusannya dalam mempromosikan interaksi sosial dalam kalangan warga tua untuk meningkatkan kualiti hidup mereka. Meskipun manfaat taman bandar diakui secara meluas, terdapat jurang ketara dalam penyelidikan yang menumpu kepada peranannya dalam mempromosikan interaksi sosial, khususnya di Asia. Kajian ini bertujuan untuk meneroka bagaimana taman bandar mempengaruhi interaksi sosial warga tua, dengan memberi tumpuan khusus kepada kesan faktor peribadi, sosial, dan persekitaran fizikal serta corak penggunaan taman terhadap interaksi sosial warga tua. Kajian ini menggunakan reka bentuk kaedah campuran serentak, menggabungkan tinjauan soal selidik (n=589), pemerhatian bukan peserta (n=6070), dan temu bual separa berstruktur (n=13), yang menyasarkan warga tua berusia 50 tahun ke atas di Anyang, China. Dapatan kajian menunjukkan bahawa taman-taman bandar merupakan tempat penting untuk interaksi sosial warga tua. Faktor peribadi, sosial, persekitaran fizikal, dan penggunaan taman secara signifikan mempengaruhi interaksi sosial warga tua. Selain itu, corak penggunaan taman bertindak sebagai jambatan dalam menghubungkan kesan faktor persekitaran fizikal dan sosial terhadap interaksi sosial warga tua. Tambahan pula, kajian ini mendedahkan bahawa keutamaan peribadi, sikap, dan pengalaman juga memainkan peranan langsung dalam pembentukan dan perkembangan aktiviti sosial. Penemuan ini

memberikan sumbangan yang signifikan kepada teori-teori yang berkaitan dengan persekitaran dan warga tua. Kajian ini mencadangkan bahawa perancang bandar, pengurus taman, dan pekerja komuniti harus menggunakan kaedah langsung dan tidak langsung untuk mengoptimumkan pengalaman penggunaan taman bagi warga tua, memperbaiki persekitaran fizikal dan sosial taman, memberi tumpuan kepada keperluan warga tua, dan bersama-sama mempromosikan interaksi sosial dalam kalangan warga tua.

**THE INFLUENCE OF PERSONAL, SOCIAL AND PHYSICAL  
ENVIRONMENT FACTORS ON SOCIAL INTERACTION OF OLDER  
ADULTS IN URBAN PARKS, ANYANG, CHINA**

**ABSTRACT**

With the intensification of global population aging, the health and well-being of older adults have become a focal point of societal concern. Urban parks, as important venues for promoting social interaction among older adults, are crucial in their design and management for improving the quality of life of older adults. However, despite the broad recognition of urban parks' benefits, there is a notable gap in research focusing on their role in promoting social interaction, particularly in Asia. This study aims to explore how urban parks affect the social interaction of older adults, focusing particularly on the impacts of personal, social, and physical environment factors and park use patterns on older adults' social interaction. The study adopts a convergent mixed-methods design, combining questionnaire surveys (n=589), non-participant observations (n=6070), and semi-structured interviews (n=13), targeting older adults aged 50 and above in Anyang, China. The findings indicate that urban parks are important venues for older adults' social interaction. Personal, social, physical, and park use pattern factors significantly influence older adults' social interaction. Moreover, park use patterns act as a bridge in linking the impacts of physical and social environment factors on older adults' social interaction. Furthermore, the study reveals that personal preferences, attitudes, and experiences also play a direct role in the formation and development of social activities. These findings make significant contributions to theories related to the environment and older adults. The study suggests that urban planners, park managers, and community workers should adopt

direct and indirect methods to optimize the park experience for older adults, improve the physical and social environments of parks, focus on the needs of older adults, and jointly promote social interaction among older adults.

# CHAPTER 1

## INTRODUCTION

De Beauvoir (1996), in her work *The Coming of Age*, raises a profound question: How can society ensure that individuals live with dignity in their old age? She argues that the answer is straightforward: we must always regard people as human beings. The way society treats those who are no longer part of the workforce reveals its true nature (De Beauvoir, 1996). The realities of life for older adults are often fraught with "danger" and "fragility," as they enter a stage of life marked by loss, sensitivity, illness, and unpredictability. Yet, beneath this fragile exterior lies a deep reservoir of human experience, including love and hate, longing and regret, which ultimately define what it means to be truly "human" (Nan, 2024).

In China, modern life for older adults reflects diverse realities. Under the current retirement system in China, women typically retire around the age of 50, while men generally retire around the age of 60. This implies that many older adults enter the retirement phase while still in the prime of their lives. For many, retirement signifies a loss of purpose, leading to a gradual decline in vitality. However, some individuals demonstrate that aging is not merely a process of decline but also an opportunity to enrich life and deepen interpersonal relationships. In this context, urban parks serve a crucial role as significant public spaces (Jacobs, 1961; Gehl, 2011). They not only offer older adults places for leisure and relaxation but also provide essential venues for social interaction, maintaining physical health, and sustaining mental vitality (Huang & Lin, 2023). For those living in rapidly urbanizing environments, parks offer a revitalizing oasis where connections can be forged. This study focuses on older adults aged 50 and above, reflecting the definition of older adults under the Chinese retirement system.

Despite the vital role urban parks play for older adults, there is a relative scarcity of research on their relationship with social interaction among this demographic. This gap is particularly evident with the emergence of the older adults in young age, primarily consisting of those born in the 1960s who have benefited from China's economic boom and are now entering old age. Compared to previous generations, this group possesses higher educational levels, greater financial independence, and a more open outlook. They seek more than just meeting basic needs; they aspire to enrich their lives through lifelong learning, meaningful social interactions, and active community participation. Therefore, this study aims to explore how urban parks, as vital public spaces, can meet the evolving needs of older adults, particularly in promoting social interaction.

## **1.1 Research Background**

Population ageing is a growing global phenomenon, particularly pronounced in China, with profound implications for social policy and public health. Aging societies are characterized not only by demographic shifts but also by complex challenges related to health, economics, and social challenges. To address these issues, it is crucial to explore strategies that enhance the health and well-being of older adults.

In this section, the current state of aging globally and in China, the importance of social interactions among older adults, and the role of urban parks in promoting social interactions of older adults will be explored in detail. These provide valuable perspectives for understanding and responding to aging issues, which can contribute to more effective policies and planning to improve the quality of life of older adults.

### **1.1.1 Global and Chinese Ageing**

Global population ageing is a significant social phenomenon, evidenced by the increased proportion and rapid growth of older adults. According to World Health Organization (WHO) estimates, the population over 60 will increase from 1 billion in 2020 to 1.4 billion by 2030 and then double to 2.1 billion by 2050 (World Health Organization, 2022). The rate and extent of ageing vary globally. For instance, by 2050, the proportion of people 65 and older in Europe and North America will be expected to be 19.1%, and in East and Southeast Asia it will grow to 37% and in Central and South Asia to be 21% (United Nations, 2019). These statistics highlight the global concerns regarding ageing and its impact on social policy.

China, one of the world's fastest ageing countries, confronts unique challenges. Due to rising life expectancy and falling mortality rates, the proportion of individuals over 60 is predicted to hit 28% by 2040 (World Health Organization, 2016). As a critical example of global ageing trends, China is experiencing rapid ageing along with increasingly complex issues.

China's rapidly ageing population introduces numerous health, social, and cultural challenges. As the population ages, the prevalence of chronic non-communicable diseases has risen significantly and is expected to increase by at least 40% by 2030 (Langenbrunner et al., 2011). Urbanization and higher female workforce participation have shifted traditional family structures, resulting in fewer multigenerational households and more older adults living alone or with their spouses only (Yang, 2012; Hu & Peng, 2015). Furthermore, the accelerated social ageing process has highlighted the empty nest phenomenon, where many older adults lack the support of their children due to the one-child policy and population mobility (Z. Feng & Phillips, 2024). While intergenerational caregiving remains prevalent, it enhances

well-being and reduces loneliness among older adults who engage in daily activities (Hou et al., 2024). Nonetheless, However, with further aging, the responsibility of caring for grandchildren may also bring additional physical and mental burdens (Pan & Chen, 2022).

In response to these challenges, the WHO developed the concept of "healthy ageing," highlighting the interplay between an individual's intrinsic capabilities and environmental factors, such as the physical surroundings, interpersonal connections, personal values, healthcare and social policies, and their support systems (Din, 2001). Following these guidelines, China has implemented a national strategy to promote the health and well-being of its aging people and improve their quality of life through the development of age-friendly cities (World Health Organization, 2016).

### **1.1.2 The Significance of Social Interaction for Older Adults**

The World Health Organization has identified relationship building and maintenance as one crucial factor for healthy aging among older adults. In China, the 2018 White Paper on Mental Health of the Older adults reports that 63% of older adults frequently experience loneliness, with 54% feeling isolated even in social settings. Alarmingly, more than a quarter of those aged 60 and above have entertained thoughts of suicide because of physical or other factors. These statistics highlight the significant mental health challenges faced by older adults in China, with loneliness, which exacerbated by retirement, divorce, economic issues, and interpersonal struggles, being a primary psychological burden.

Face-to-face interactions effectively decrease loneliness and social isolation in older population. However, aging typically results in the contraction of social networks due to life transitions and declining physical abilities, complicating the maintenance of social ties (Holt-Lunstad et al., 2015; Berkman et al., 2000; Holt-Lunstad et al.,

2010). Notably, reduced social support in older age groups correlates with heightened health risks. For example, Sugisawa et al. (1994) revealed that older adults without social connections had a significantly increased risk of mortality within three years.

Numerous studies have confirmed that regular participation in social activities not only enhances older adults' emotional connection, but also significantly improves their mental and physical health. Engaging in social interaction reduces feelings of loneliness and isolation, which are closely linked to depression, anxiety, and various health conditions, including heart disease (Zagic et al., 2022). Moreover, regular social engagement can delay cognitive decline, improve memory and cognitive functions, and may help protect against diseases like Alzheimer's (Majoka & Schimming, 2021). Therefore, promoting social interaction of older adults is important to maintain quality of life and ensure well-being in later life.

Participation in neighbourhood and community activities not only sustains social engagement among older adults but also significantly mitigates the health impacts of loneliness and isolation (J. Yang & Moorman, 2021). Urban green spaces often serve as central hubs for their daily social activities (T. Xu et al., 2022). However, the design and planning of these spaces often lack attention to the needs of older adults, particularly neglecting their social requirements. This oversight has resulted in a lack of research focused on fostering social interaction of older adults (Y. Zhang et al., 2022).

### **1.1.3 Urban Parks and Social Interaction of Older Adults**

Urban parks, a crucial type of urban green space, have a significant impact on improving the overall well-being of residents, particularly older adults, by offering substantial health, social, and environmental benefits (Bedimo-Rung et al., 2005). Research indicates that these parks facilitate physical activity, boost fitness and

immunity, and help prevent or slow the progression of age-related diseases among the older adults (Zhai et al., 2020). Moreover, the green spaces within parks contribute to reducing psychological stress, mitigating feelings of loneliness and depression, and elevating the psychological well-being and life satisfaction of older adults (Liu et al., 2019; Chiesura, 2004).

Urban parks should serve not only as venues for exercise but also as vital spaces for social interaction (Gardner, 2011; Parra et al., 2010). With increased leisure time during retirement, the shrinking social networks of older adults highlight their acute need for emotional and spiritual support in urban settings. The social support functions of urban parks are thus essential for many older adults (Cohen et al., 2009). This is because the social interaction that occur in parks not only help older adults maintain social relationships, but are also critical to their overall well-being, and the importance of such interactions appears to be more pronounced as they age (Carstensen, 2006). Well-designed urban parks can fulfil the socialization needs of older adults by offering various social activities, which in turn enhances social interaction between people (Duque & Panagopoulos, 2010; Madanipour, 2001; Kaźmierczak, 2013). This frequent face-to-face contact contributes to social bonding (Halpern, 1995; Kuo et al., 1998; Leyden, 2003).

Despite urban parks offer several advantages for residents, they are not fully utilized to meet the interests of various groups (Moulay et al., 2017; Azmi & Karim, 2012), resulting in inadequate possibilities for social interaction of older adults. Research has shown that the social and physical environments of urban parks show a significant influence on the social engagement of older adults (Enssle & Kabisch, 2020; Wan et al., 2021). These factors influence not only how older adults perceive and

evaluate parks but also their engagement and interactions within these spaces, thereby impacting the health and well-being benefits derived from park usage (Chang, 2020; Grilli et al., 2020).

Although much existing research has focused on the impact of urban parks on physical activity, there has been comparatively less emphasis on their contribution to fostering interaction with others among older adults (Sheng et al., 2021; Cao & Kang, 2019). Compared to other age groups, older adults may be one of the most socially inactive groups (Dumith et al., 2011; Notthoff et al., 2017). Moreover, few studies have explored how urban parks influence the social interaction of this age group (Zhang et al., 2022; Khaleghimoghaddam, 2023; Yuqi Liu et al., 2023; Aspinall et al., 2010). Additionally, the specificity of older adults suggests that findings from studies conducted in some settings may not be applicable to others (Paudel et al., 2023; Schmidt et al., 2019). Thus, this study aims to investigate the influence of urban parks on the social interaction of older adults.

## **1.2 Problem Statement**

Urban parks, as a space that can provide social interaction for residents, are considered an important aspect of urban civilization (Hesham et al., 2014; Baharuddin et al., 2014). The engagement of residents with these environments typically manifests through social activities and interactive behaviours (Sun et al., 2020; S. Chen et al., 2024). Older adults, in particular, spend more time in green spaces in and around compared to other age groups, highlighting the significance of these areas for them (X. Yang et al., 2023). Despite their appealing design, urban parks are often underutilized, especially by older adults, due to various barriers (Onose et al., 2020; Gibson, 2024; Van Riper & Kyle, 2014; Karuppanan & Sivam, 2013).

The World Health Organization emphasizes the need of providing supportive public places to enhance the social well-being of older adults (Kono et al., 2004). Despite this, research indicates that urban public spaces often fail to adequately promote healthy aging (Frank et al., 2010). Urban parks, while able to serve older adults, are often limited in frequency and scope of use due to unfriendliness, safety issues, poor accessibility and other problems (Wan et al., 2021; Schmidt et al., 2019). Additionally, the scarcity of social interaction among older adults in these spaces can be attributed to a variety of reasons, which include factors such as insufficient social support structures and inadequate physical amenities.

Although there is extensive research on the health benefits of urban green spaces, studies on how older adults utilize these spaces, how they socially interact, and the role of these green spaces in promoting social inclusion are less abundant (Gibson, 2018). Some research indicates that urban green spaces foster social interaction of older adults (Wang et al., 2022; Sonmez Turel et al., 2007; Sugiyama & Thompson, 2008; Sugiyama et al., 2009). Evidence suggests that park quality impacts usage for activities such as physical exercise and socializing more than proximity does (Van den Berg et al., 2019; Kemperman & Timmermans, 2014; Kabisch & Haase, 2013). Recent studies have investigated park users' perceptions of which park characteristics promote their social interaction (Veitch et al., 2022; Rivera et al., 2021), and have found that these characteristics contribute significantly to users' health and social well-being (Huang & Lin, 2023; Li et al., 2023). Additionally, features like park facilities and maintenance have been positively linked to social interaction (Rasidi et al., 2012; Coley et al., 1997; Kaplan & Kaplan, 1989).

While recent studies have concentrated on the correlation between urban parks and their users, the focus has predominantly been on physical activity (S. Chen, 2020). Despite public spaces being valued for their multifunctionality, there has been limited research on their role in facilitating social interaction. Early research highlights the important role of park size and type in facilitating social interaction in parks (Krellenberg et al., 2014). Recently, more attention has shifted toward the interplay between environmental attributes and social interaction within parks. Several studies now aim to objectively measure the impact of park features on social behaviours (Poppe et al., 2022). Although Jacobs (1961) made pioneering observations in the 1960s about how the built environment influences social relationships, empirical validation of her ideas has been sporadic and yielded mixed results (J. Huang et al., 2023; Banchiero et al., 2020).

While numerous studies have explored the impact of physical or social environment factors on older adults' social interaction in urban parks, they often examine a limited range of physical or social factors. For example, Veitch et al. (2022) highlights that amenities like shade, serene environments, and walking paths are crucial for fostering physical activity and social interaction. Similarly, Gaikwad & Shinde (2019) note the role of parks in providing social interaction spaces that enhance perceptions of social support. However, comprehensive analyses considering multiple park attributes and their combined effects on social interaction are scarce. Despite a general consensus on the influence of social and physical environments on social interaction, the debate continues over which park attributes significantly impact social interaction (Chen et al., 2024; Sheng et al., 2021; Peters et al., 2010).

Meanwhile, the majority of research conducted on social contact has mostly concentrated on the measurement of social interaction, such as the frequency of social interaction (Veitch et al., 2022; Cao & Kang, 2019), the number of interactions with neighbours (Tao et al., 2020; Yamada & Knapp, 2010). However, it is crucial to acknowledge that the quality of social interaction holds significant influence over the well-being of older adults, but research in this aspect remains underexplored (Van den Berg et al., 2015; Pinguart & Sorensen, 2001; L. Gibson et al., 2010). Although frequent social interaction may have a beneficial effect on the psychological and emotional well-being of older adults, it is equally important to consider the level, depth, and reciprocity of social interaction (Berkman et al., 2000; Uchino, 2006). Based on the established definition of social interaction, it is important to take into account both the number and the level of social interaction as measures of social interaction (Chen et al., 2023; Veen et al., 2016; Kaźmierczak, 2013).

Current research has made some progress in revealing the influence of social and physical environments on social interaction, but findings are inconsistent and diverse. For instance, Ayala-Azcárraga et al. (2019) found that while physical features of urban parks such as tree abundance, safety, and amusement equipment quality influence use patterns, visitors' well-being comes more from interactions with familiar individuals. This highlights the potential benefits of focusing on enhancing social features within parks rather than solely improving physical infrastructure. Moreover, Otero Peña et al. (2021) highlighted the importance of social cohesion and trust in encouraging park usage, while also recognizing the role of physical characteristics in facilitating social interaction. This suggests the need for an integrated approach in park design and management that considers both physical and social factors to better support social interaction of older adults. However, Salwa (2019) study of park

facilities in Utrecht showed that social cohesion is not directly related to the frequency of social interaction, but rather to the quality and quantity of park facilities. This further suggests that more research is needed to elucidate the specific role of social and physical environments in facilitating social interaction.

Overall, while some associations between environmental factors and social interaction have been identified, there is not yet a broad consensus on the specific nature and strength of these associations. Notably, existing studies have generally targeted adults of all ages, leaving uncertainties about which environmental attributes most significantly influence social interaction of older adults. This gap in knowledge presents substantial challenges for urban planners tasked with designing parks that support healthy aging and enhance the quality of life for older populations.

### **1.3 Research Gap**

Despite the growing interest in the social interaction of older adults, substantial gaps persist in both theory and practice, particularly concerning their interactions in urban green spaces. Environmental Gerontology (EG) has notably advanced our understanding of older adults' relationships with their environments. However, the focus has predominantly been on the physical environment's impact on life quality, often overlooking social interaction and their multidimensional environmental determinants (Wahl et al., 2012). Additionally, most existing studies prioritize the physical aspects of homes and communities, while social environmental research has mainly examined neighbourhoods, significantly neglecting urban green spaces (Scheidt & Norris-Baker, 2003; Wahl & Weisman, 2003). Consequently, our comprehension of older adults' social interaction within these multifaceted environmental contexts remains limited.

Although environmental gerontology has acknowledged the significant impacts of social and physical environments on older adults' lives (Wahl et al., 2012), systematic research into specific strategies to optimize and harmonize these environments to enhance social interaction remains sparse. For instance, strategies to balance physical and social environments to maximize the social engagement of older adults in urban parks require further investigation.

However, older adults' social interaction behaviours are the result of a combination of multilevel factors, including, but not limited to, the physical and social environments (Schmidt et al., 2019). There is a lack of comprehensive research examining how these factors collectively impact older adults' social interaction (Townsend et al., 2021; Cramm et al., 2013; Yen et al., 2009). Current studies often focus narrowly on single factors without employing a systematic, multilevel approach to fully understand their effects on social behaviours (Bonaccorsi et al., 2020).

Socio-ecological Model highlights that behaviours are shaped by a range of factors, including personal factors, interpersonal relationships, community characteristics, and policy environments, offering a comprehensive framework for promoting health behaviours (McLeroy et al., 1988). While the socio-ecological model has been used to elucidate individual health behaviours, its application to the social interaction of older adults is still underdeveloped (Levasseur et al., 2015; Sugiyama et al., 2023). Yet, most research utilizing this model has concentrated on physical activity, with less attention to the social interaction of older adults. This oversight restricts our understanding of how multilevel factors can be optimized to enhance social interaction of older adults in urban parks.

Literature review reveals limited studies directly examining public spaces and social interaction of older adults (e.g., Veitch et al., 2022; Zhong et al., 2022; Schmidt et al., 2019; Sugiyama et al., 2023), predominantly in developed regions like Europe and the United States, with very limited research in Asia (Chang, 2020). As one of the fastest aging countries, China has recently shifted focus towards programs and policies for healthy aging. Although research on urban parks and their role in the social interaction of older adults in China has been rising, it remains largely confined to major cities such as Hong Kong (Guo et al., 2021), Beijing (Tao et al., 2020), Shanghai (Y. Hu et al., 2021), Chongqing (Chongqing et al., 2020), and Guangzhou (Zhou et al., 2020), with negligible focus on medium-sized cities.

In view of the fact that medium-sized cities are the main areas of China's urbanized population flow and constitute the bulk of China's urban system, a detailed study of this type of city is crucial (World Health Organization, 2016). These cities encounter distinct challenges and opportunities in the aging process, yet the influence of urban park design and management on older adults' social interaction remains underexplored (J. Luo et al., 2022). This study, focusing on Anyang City, examines how urban parks in medium-sized Chinese cities impact older adults' social interaction and offers optimization strategies based on these insights, aiming to inform policies for healthy and active aging.

Therefore, this study seeks to address these theoretical and practical gaps. Employing Environmental Gerontology and social ecological model of health behaviour, it will thoroughly explore the influence of physical, social, and personal factors, along with use patterns, to elucidate their collective impact on older adults' social interaction. Drawing on empirical data, the study will recommend specific

strategies to enhance urban park design and management, thus fostering older adults' social engagement and overall well-being. This research aims to improve the well-being of older adults, while also offering a scientific foundation for urban planning and public health policy formulation.

#### **1.4 Research Aim**

This study aims to explore and understand how urban parks influence the social interaction of older adults. By conducting a comprehensive analysis of personal, social, and physical environment factors, this study reveals the integrated effects of these factors on older adults' social interaction. Based on the findings, it suggests specific strategies for enhancing the design and management of urban parks to foster healthy aging and improve overall well-being of older adults.

#### **1.5 Research Objectives**

The following research objectives have been formulated to accomplish the research aims:

1. To identify the usage patterns and social interaction of older adults in the urban parks.
2. To examine the relationship between personal, social, physical and use pattern factors and social interaction of older adults in urban parks.
3. To explain how personal, social and physical factors impact social interaction of older adults in urban parks.

#### **1.6 Research Questions**

To address the research objectives, the following questions are answered:

##### **Research Objective 1**

- i. What are the patterns of park use of older adults in urban parks?
- ii. What types of social interaction do older adults engage in within urban parks?

### **Research Objective 2**

- iii. What are the relationships between personal, social, physical and use pattern factors and social interaction of older adults in urban parks?
- iv. Are there any mediating effects of park use patterns on the relationship between physical and social environment factors and the social interaction of older adults in urban parks?

### **Research Objective 3**

- v. How do personal, social and physical factors impact the social interaction of older adults in urban parks?

## **1.7 Research Scope**

This study was conducted to investigate the relationship between older adults and urban parks, specifically examining how the physical environment, social environment, and personal factors within urban parks influenced the social interaction of older adults. The study targeted older adults aged 50 and above in China (Detailed reasons are provided in section 2.3.1), particularly those who were frequent users of urban parks. This study focuses on urban comprehensive parks, characterized as multifunctional public spaces that offer urban residents opportunities for leisure, exercise, social interaction, and nature experiences. These parks are typically large in scale and well-equipped, making them suitable for studying older adults' social interaction.

The terminology used to describe the population in this study is critical. According to Avers et al. (2011), the term "elderly" has been widely criticized for being imprecise, overly general, and potentially ageist, as it often stereotypes a diverse group of individuals with varying levels of health and independence. Such generalization fails to capture the heterogeneity among older adults and can contribute to ageism, which negatively impacts societal perceptions and the treatment of this population. To avoid these issues and to adhere to more respectful and precise language, this study adopts the terms "older adults". This term is not only more accurate and specific but are also preferred by the individuals themselves (Avers et al., 2011).

In the quantitative section, the study utilized observation and a questionnaire to gain an in-depth understanding of older adults' park use and social interaction behaviours, as well as the impact of various factors on social interaction. The observation recorded activity types, frequency, social relationships, and spatial distribution, providing direct insights into their social dynamics. The questionnaire explored the impacts of physical environment factors, including park features, park conditions, park aesthetics, park safety, and park accessibility, on the frequency and level of social interaction. The study also assessed social environment factors like social cohesion, social support, and sense of belonging, along with socio-demographic characteristics, to understand their influence on social interaction. Additionally, this research investigated how park use patterns affected these interactions, examining both direct and indirect effects. The qualitative portion included a semi-structured interview to further understand older adults' experiences and perceptions related to social interaction.

This study was conducted in two urban parks in Anyang. The rationale for choosing Anyang as the study site was that it served as a typical representative of medium-sized cities in China, providing a representative case study (refer to section 3.3.1 for details). The data collection and analysis were conducted in 2023, with data collected through a questionnaire survey, semi-structured interview, and on-site observation. This study was expected to reveal the factors influencing the social interaction of older adults in urban parks and propose strategies for optimizing park design and management. These findings were intended to provide scientific evidence for urban planners and policymakers, promoting healthy aging and the social well-being of older adults.

## **1.8 Research Significance**

Population ageing is a critical issue facing the world, but it is unclear how to create environments to support active and healthy ageing. Research indicates that face-to-face social interaction are crucial to the health and well-being of older adults. Thus, this study investigates the relationship between urban parks and older adults' social interaction using methodological triangulation, addressing the literature gap.

Theoretically, the findings will offer fresh insights into the dynamics of social interaction and healthy aging. Few studies in urban planning have explored how urban parks influence older adults' social interaction; this study contributes significantly to this field. Simultaneously, this study expands the theoretical framework of Environmental Gerontology, which emphasizes the profound impact of physical and social environments on the behavior, well-being, and social connections of older adults. However, existing research predominantly focuses on residential settings or care facilities, with limited attention to the role of public spaces, such as urban parks, in

supporting social interactions among older adults. By revealing how urban parks support social interactions of older adults, this study offers new perspectives for the theoretical applications of Environmental Gerontology. Additionally, this study aligns with the Socio-ecological Model of health behavior, which highlights that individual behavior is shaped by multiple levels of influence, including personal, social, and environmental factors. By integrating this framework, the study explores how various dimensions of urban parks influence the social interaction of older adults, providing the new perspective and application of the Socio-ecological Model in research on healthy aging. Moreover, it aligns with the Sustainable Development Goals (SDGs) set forth by the United Nations, namely Goal 3 (Good Health and Well-being) and Goal 11 (Sustainable Cities and Communities), promoting global sustainable development by enhancing healthy aging and creating inclusive urban environments.

Practically, this research will guide policy and urban planning, improving the social well-being of older adults by identifying and enhancing factors crucial to their social interaction. It also enhances understanding of urban parks' role in fostering social interaction within the Chinese context, a relatively underexplored area. The findings will help develop specific policies for healthy aging, optimizing urban park design, and improving older adults' quality of life.

## **1.9 Operational Definitions**

*Urban Park:* Urban parks are natural, semi-natural, or artificial green spaces established for recreation, leisure, and the conservation of wildlife or natural habitats. These parks may include grasslands, rocks, soil, trees, as well as artificial structures such as buildings, monuments, fountains, and recreational facilities (Sadeghian & Vardanyan, 2015). According to the Chinese Urban Park Classification Standard

(CJJ/T852017), a comprehensive urban park is defined as a green space enriched with diverse facilities, suitable for various outdoor activities, and equipped with comprehensive recreational and support management services. It is recommended that such parks be larger than 10 hectares. In this study, these comprehensive urban parks are simply referred to as urban parks.

*Social Interaction:* In this study, social interaction is defined as verbal and non-verbal face-to-face interactions between individuals.

*Older Adults:* In this study, "older adults" are defined as individuals aged 50 years and older, with a special focus on those who have free time to use urban parks. The age of 50 is chosen because it marks a transition period in China where many begin to retire or semi-retire, leading to significant changes in lifestyle, health, and social roles. As they gain more free time, their needs for healthy aging and social interaction become increasingly important.

*Social Environment Factors:* Social environment factors comprise various social characteristics and conditions that affect individual behaviour, psychological states, and social interaction. In this study, social environment factors are defined as older adults' subjective perceptions of social cohesion, social support, and a sense of belonging within urban parks.

*Social Support:* this study refers to the emotional and practical assistance individuals receive from urban parks (Wilkinson & Marmot, 2003).

*Social Cohesion:* this study refers to the degree of trust, mutual assistance, and solidarity among individuals in urban parks (Commins, 1993; Forrest & Kearns, 2001).

*Sense of Belonging:* this study refers to the sense of belonging and welcome felt by individuals in urban parks (Hagerty et al., 1992).

*Physical Environment Factors:* This study refers to the observable and measurable characteristics of urban parks that impact the experiences and social interaction of older adults. These factors include characteristics such as park features, conditions, aesthetics, safety, and accessibility (Bedimo-Rung et al., 2005).

*Park Features:* This study refers to the presence and availability of various amenities and greenery within the parks. This includes elements such as benches, restrooms, exercise equipment, and trees (Bedimo-Rung et al., 2005).

*Park Condition:* This study refers to the maintenance status of park facilities and equipment, encompassing aspects such as cleanliness, repairs, and maintains (Bedimo-Rung et al., 2005).

*Park Aesthetics:* This study refers to the visual attractiveness of the parks, which includes such as buildings, sculptures, and water landscape (Bedimo-Rung et al., 2005).

*Park Safety:* This study refers to the measures taken in the parks to ensure the safety of users, including such as lighting, traffics, and security features (Bedimo-Rung et al., 2005).

*Park Accessibility:* This study refers to the ease of access to the park for users and the accessibility of different areas and facilities within the parks (Bedimo-Rung et al., 2005).

*Park Use Patterns:* This study refers to the behavioural characteristics related to how people use urban parks, including the types of activities, their frequency, timing, and spatial distribution (Evenson et al., 2013).

*Healthy Aging:* Healthy aging is described as a state of health and well-being attained by preserving and enhancing physical, mental, and social capabilities throughout life. According to the World Health Organization, healthy aging transcends

the mere absence of disease or disability; it involves maintaining optimal functioning, actively participating in social activities, and enjoying life independently as one ages (World Health Organization, 2015).

*Medium-sized City:* A medium-sized city, as classified by the People's Republic of China, is a city whose urban area has a resident population ranging from more than 500,000 to less than 1 million. This urban area encompasses regions under the jurisdiction of residents' committees, city districts, unincorporated municipalities, and areas physically connected by urban development, excluding townships and villages.

## **1.10 Organization of the Chapters**

This section elucidates the structural arrangement of the chapters, and the thesis is divided into six chapters.

**Chapter 1** provides an overview of the research background, problem statement, research gaps, research aim, research objectives and questions of this study. Then, this chapter explains the research significance, research scope, and the operational definitions of the terms used in this study.

**Chapter 2** reviews the existing literature related to this study. It first explains the research underpinning of the relationship between the environment and older adults, then discusses the subjects of this study. Next, this chapter explores the relevant literature on the older adults and urban parks, as well as the literature on the main variables of this study, including social interaction, social environment, physical environment, personal factors, and park use patterns.

**Chapter 3** describes the research methodology of this study. It begins with a discussion of the research design utilized for the study, followed by a description of the

study site, research population, sample selection, and sample size. Subsequently, this chapter clarifies the ethical considerations, and describes the quantitative and qualitative methods and data collection processes. Finally, the results of the pilot study are described and the data preparation and data analysis methods of this study are further explained.

**Chapter 4** presents the relevant qualitative and quantitative research results according to the research objectives. Based on the three research objectives, the corresponding research questions are answered, and the related qualitative and quantitative analysis results are listed.

**Chapter 5** discusses the research results according to the research objectives. First, this chapter discusses the research results on the use and social interaction characteristics of older adults in urban parks. Then, it discusses the impact of urban parks on the social interaction of older adults, including the relationship between social factors, physical factors, personal factors, and park use patterns and the social interaction of older adults, and further explores how these factors affect the social interaction of older adults.

**Chapter 6** presents the conclusions of the thesis. It summarizes the key findings, theoretical contributions, and practical contributions. Next, it addresses the limitations of the research and directions for future research. Finally, this thesis is summarized.

## **CHAPTER 2**

### **LITERATURE REVIEW**

#### **2.1 Introduction**

As outlined in the previous chapter, this study focuses on exploring the role of urban park on social interaction of older adults. This chapter reviews relevant research underpinning and empirical evidence crucial for developing the conceptual framework of this study. Social interaction is a complex behaviour influenced by a diverse and interdependent set of factors, encompassing personal, social, and physical environment factors (Sallis et al., 2006).

Consequently, this chapter first elaborates on the theoretical foundation related to this study, then describes the specific relationship between urban park and the social interaction of older adults. It then discusses the relationship between the personal, social, physical environment, park use factors and the social interaction of older adults. Finally, it draws on existing social ecological models and evidence from related empirical studies and combines them with the research objectives of this study to develop the conceptual framework for this research.

#### **2.2 Research Underpinning**

There are two theoretical foundations that can explain the relationship between the social interaction of older adults and the urban park environment: environmental gerontology and the socio-ecological model. The following sections will elaborate on these theories in detail.

### **2.2.1 Environmental Gerontology (EG): Understanding the Relationship Between Older Adults and Environment**

Environmental Gerontology, as a major branch of gerontological research (Kendig, 2003), focuses on elucidating the complex relationship between older adults and their environment. EG focuses on how the social and physical environments influence the lives of older adults and emphasizes the multilevel effects of the environment on the health of older adults, highlighting its complexity and diversity (M P Lawton, 1977; M P Lawton, 1999; Scheidt & Windley, 1985). Specifically, EG is to provide a comprehensive description, explanation, modification, or optimization of the relationship between older adults and their social spatial environments. This includes focusing on older adults' relationships with multiple environments, such as their families, housing, neighbourhoods, and the outdoors, as well as the impact of these environments on older adults' opportunities and limitations (HW. Wahl & Weisman, 2003).

Lewin (1951) proposed the concept of "life space," considering how individuals are connected to their surrounding environment and introduced the theory of Person-Environment fit. This theory has become a fundamental perspective in social and behavioural sciences. EG is built upon this theoretical foundation, emphasizing the complex, interactive relationship between people and their environment, especially as this relationship may peak in old age (HW. Wahl & Weisman, 2003).

The theoretical foundation of this field has long been rooted in Lewin (1951)'s formula ( $B = f [P, E]$ ), which posits that behaviour (B) is a function of both personal (P) and environmental (E) characteristics, emphasizing the importance of person-environment transactions (P-E transactions) and the co-construction of development (HW. Wahl & Weisman, 2003). However, M Powell Lawton & Nahemow (1973) argued that this theory is "too broad" and does not explicitly specify the interaction