Future Cities and Environment
ISSN 2363-9075 Volume 11 (2025)

https://doi.org/10.70917/fce-2025-014
Article

Factors Influencing Social Interaction among Neighborhood Residents in Public Open Spaces: A Review

Abdulrahman A. Alnaim [1], Umar Lawal Dano [2,*] and Ali M. AlQahtany [3]

Department of Urban and Regional Planning, College of Architecture and Planning, Imam Abdulrahman Bin Faisal University, Dammam 31441, Saudi Arabia; alnaim01@gmail.com (A.A.A.); amalqahtany@iau.edu.sa (A.M.A.)
* Corresponding author: uldano@iau.edu.sa

Abstract: Sustainability is built on three key pillars: economic, environmental, and social. Among these, social sustainability has received the least scholarly attention. This study explores social sustainability with a focus on social interaction in public open spaces, identifying the factors that influence such interactions among neighborhood residents. Specifically, it seeks to answer the research question: What are the key factors that influence social interaction in public open spaces within residential neighborhoods? A qualitative content analysis is employed, synthesizing insights from academic articles, papers, and books. Additionally, a comparative case study approach is used to analyze multiple cases, revealing relationships, differences, and similarities. The findings highlight that a well-designed environment is crucial for fostering social interaction. Three main categories influencing social interaction in public open spaces are identified: Demographic Characteristics of Neighborhood Residents (DCNR), Physical Characteristics of Recreational Facilities (PCRF), and Social Sustainability Characteristics (SSC). The study concludes that integrating these factors into public space design can enhance social cohesion and community well-being. By emphasizing social sustainability in urban planning and policymaking, this research underscores the need for inclusive, vibrant neighborhoods. Addressing the identified factors enables urban planners and designers to strengthen community ties and improve overall urban quality of life.

Keywords: social sustainability; social interaction; open public space; recreational facilities; residential neighborhood

1. Introduction

Social interaction refers to a sequence of dynamic exchanges through which individuals assign meaning, interpret, and respond to one another (Salih and Ismail 2017). It also encompasses communal activities among neighbors, such as borrowing or lending tools, informal visits, and seeking assistance during emergencies (Unger and Wandersman 1985). Social interactions play a pivotal role in the social sustainability of urban communities, as they enhance the sense of community and safety in urban neighborhoods (Dave 2011). Neighborhood public open spaces are critical to urban areas, offering spaces for various recreational and sporting activities for residents of all age groups, from youngsters to the elderly (Carlisle and Stankovich 2014). These spaces contribute significantly to physical, social, emotional, and environmental well-being, serving as integral components of the urban fabric and addressing the daily needs of urban populations. The availability and quality of green spaces within neighborhoods are strongly linked to residents' overall health and well-being (Chen et al., 2016). Previous studies have underscored the importance of public open spaces in fostering social interaction among neighborhood residents. For instance, Bekker et al. (2010), Kara et al. (2011), Sakip et al. (2015), and Salih and Ismail (2017) highlight those open spaces are vital settings for social engagement and community enjoyment. However, effective social interaction requires a conducive environment, which depends on various factors such as the design, components, location, and facilities of public open spaces

(Godbey 2009). Additionally, the types and characteristics of recreational activities available in these spaces significantly influence their capacity to facilitate social interactions.

Social interaction in public open spaces provides multiple benefits, including improved health and well-being, reduced sedentary behavior and stress, enhanced social cohesion among diverse demographic groups, support for urban regeneration initiatives, stimulation of economic growth, and increased property values (Salih and Ismail 2017). Furthermore, several studies, such as Dave (2011), and Holland et al. (2007), Henning and Lieberg (1996), emphasize that social interaction strengthens the sense of community and safety in urban neighborhoods. Despite the recognized significance of social interaction in public open spaces, limited research has comprehensively examined the interplay of factors influencing these interactions within residential neighborhoods. Most studies tend to focus on isolated aspects, such as the physical design or the availability of facilities, without integrating these into a broader framework for understanding and enhancing social sustainability. To address this gap, this study seeks to answer the following research question: What are the key factors influencing social interaction among neighborhood residents in public open spaces?

The structure of this paper is as follows: Section 2 reviews relevant studies on social interaction in public open spaces. Section 3 discusses the methodology employed for data collection and analysis. Section 4 presents the main findings of the study. Finally, Section 5 provides recommendations for improving neighborhood public open spaces and suggestions for future research directions.

2. Literature Review

The literature review aims to extensively examine the concept of residential neighborhoods and their significance in achieving overall sustainability at the neighborhood scale. It also explores the definition and role of neighborhood recreational facilities in fostering community well-being. Additionally, this section delves into various definitions and perspectives on social sustainability, emphasizing its relevance within urban contexts. Furthermore, the literature review elaborates on the concept, types, and key indicators of social interaction among neighborhood residents. It highlights factors that may influence social interaction in public open spaces, providing a comprehensive understanding of the subject.

The literature review is organized into the following subsections:

- Concept and significance of residential neighborhoods scale
- Concept and indicators of urban social sustainability
- Social interaction in residential neighborhoods
- Neighborhood recreational facilities and social interactions
- Factors influencing social interaction among users in public open spaces

This structured approach facilitates a thorough investigation of the interconnected themes and lays the foundation for understanding the critical role of neighborhood design in enhancing social sustainability.

2.1. Significance of Residential Neighborhoods Scale

Literature provides various definitions and perspectives on the concept of a neighborhood. According to recent studies, neighborhoods are often characterized as geographically confined areas where residents share a sense of social cohesion and similarity (Dempsey et al. 2012). Martí et al. (2022) defines neighborhoods as areas marked by physical boundaries and distinct degrees of social unity among residents. Similarly, Jenks and Dempsey (2007) emphasize that neighborhoods differ significantly in size, characteristics, and physical appearances, reflecting their local contexts and needs. The U.S. National Commission on Neighborhoods highlights that neighborhood are primarily defined by the perceptions of their residents, underscoring their subjective and social dimensions (Mendoza-Graf et al. 2023).

Khavarian-Garmsir et al. (2023) define neighborhoods as areas where individuals live, work, and engage in daily activities. Can (2012) identifies walkable streets, human-scaled blocks, and functional public spaces as essential components for local connectivity and urban integration. Jacobs (1961) emphasizes designing vibrant streets and interconnected parks, squares, and public buildings to promote social interactions and community ties, noting that disconnected spaces hinder neighborhood vibrancy. The concept of a neighborhood varies across cultures, geographies, and urban contexts. For this study, a neighborhood is defined as a localized area where residents live, interact, and conduct daily activities, often supported by recreational facilities and public spaces. Neighborhoods are crucial for urban sustainability, serving as the smallest social and political units within a city (Hemani and Das 2016). Choguill (2008) emphasizes that achieving global sustainability requires sustainable neighborhoods, making them fundamental to broader urban development initiatives.

2.2. Concept and Indicators of Urban Social Sustainability

Social sustainability is a fundamental pillar of sustainable urban development. However, it has historically received less attention than the economic and environmental dimensions of sustainability (Colantonio 2010; Dave 2011; Hamiduddin 2015; Omann and Spangenberg 2002; Woodcraft et al. 2011). This disparity in focus is often attributed to the intangible nature of social sustainability and its reliance on contextual factors, which make it challenging to define and measure (Cuthill 2010; Hemani and Das 2016; Neamţu 2012). Consequently, social sustainability has lagged in both conceptual development and practical implementation. The ambiguity surrounding the concept has also resulted in a lack of standardized criteria for its application, further complicating its integration into urban planning and policy (Bramley et al. 2006). Nonetheless, scholars have proposed several definitions and frameworks to enhance understanding and applicability, highlighting its core values and indicators.

Definitions of Social Sustainability

The literature offers diverse interpretations of social sustainability:

- Equity and Democracy: Social sustainability is built on the principles of equity and democracy, with democracy encompassing the exercise of political, civil, economic, social, and cultural rights (Colantonio 2010).
- Civil Society and Inclusion: It involves fostering coexistence among diverse cultural and social groups, promoting inclusion, and improving quality of life for all segments of society (Polese and Stren 2000; Colantonio 2010).
- Social Inclusion and Harm Reduction: Social sustainability supports the development of activities that mitigate social harm and promote cultural enrichment (Khan 2016; Vavik and Keitsch 2010).
- Developmental Goals: Assefa and Frostell (2007) position social sustainability as the ultimate goal of development, with economic and environmental sustainability serving as tools to achieve it.
- Interpersonal Interaction: Social sustainability is defined as a process enabling individuals and communities to interact and achieve their goals while considering environmental factors (Colantonio 2010).

Indicators of Social Sustainability

Indicators of social sustainability have evolved over time, moving from traditional measures such as poverty reduction and equity to more nuanced, intangible concepts like social capital, happiness, and sense of place (Colantonio 2010). These "soft concepts" highlight the qualitative aspects of social sustainability, which are increasingly recognized as vital to urban planning and development. Table 1 presents a compilation of essential social sustainability indicators.

Table 1. Social sustainability indicators.

Social Sustainability Features	**Reference**
Social equity participation & control Social Cohesion Health & Safety Accessibility & Satisfaction Cultural value	Olukoya and Atanda (2020) Atanda and Öztürk (2020)
Physical resilience Social networking and interaction Safety and security Sense of attachment Participation	Olukoya and Atanda (2020)
Health and Comfort Safety and security Culture and heritage Accessibility Inclusiveness Participation	Wan and Ng (2018)

Education	
Social Equity Environmental Awareness Social Cohesion Health and Safety Accessibility and Satisfaction Culture Value	TemeljotovSalaj et al. (n.d.)

Based on the reviewed literature, social interaction emerges as a critical aspect of social sustainability, consistently highlighted across numerous studies. It has been widely recognized as one of the most significant determinants of social sustainability, serving as a cornerstone for fostering community cohesion, inclusion, and well-being. Social interaction not only enhances social ties within communities but also plays a pivotal role in creating socially resilient and sustainable urban environments.

2.3. Concept of Social Interaction in Residential Neighborhoods

Social interaction is a vital aspect of any society, facilitating connections among individuals from diverse cultural and social backgrounds. Its primary goals include exchanging information, making decisions, generating ideas, resolving personal issues, and participating in communal activities (Marmot 2011). Effective social interaction relies on opportunities for communication and the availability of appropriate physical spaces that promote interaction (Skjaeveland and Garling 1997). According to Skjaeveland and Garling (1997), four key spatial prerequisites for fostering social interaction include:

- Appropriate Social Areas: The presence and extent of areas specifically designed for interaction are critical.
- Functional Street Furniture: The availability of physical elements, such as benches and tables, tailored for social engagement enhances interaction opportunities.
- Aesthetic and Visibility Factors: The overall appearance and visibility of a location influence its ability to attract and support social interaction.
- Private-Open Spaces: Features such as front yards, porches, and verandas provide semi-private settings for informal interaction among neighbors.

Definitions of Social Interaction

The concept of social interaction has been defined and explored from various perspectives:

Definitions of social interaction vary across different perspectives. Unger and Wandersman (1985) characterized it as activities such as informal visits, tool borrowing, or seeking help in emergencies. Dave (2011) underscored the significance of local social interaction in promoting social sustainability, community cohesion, and safety. Doda (2005) defined social interaction as verbal or non-verbal exchanges between two or more individuals. Abbaszadeh (2009) saw it as informal discourse facilitating access to social and economic resources. Hirschfield and Bowers (1997) portrayed social interaction as a foundational process crucial for human development and societal order, emphasizing its role in nurturing societal cohesion. Thus, social interaction can be categorized into two primary types:

- Informal Interaction: Spontaneous, casual encounters such as hallway conversations, greetings in shared spaces, or brief chats in parking lots.
- Formal Participation: Deliberate engagement in organized community activities, such as neighborhood associations, sports teams, or local service groups (Ross and Jang 2000; Dempsey et al. 2011).

While the literature presents diverse perspectives on social interaction, this research focuses on face-to-face social interactions within residential neighborhoods. These interactions include all activities that bring neighbors together, such as casual conversations, borrowing or lending materials, and participating in shared events. This emphasis on direct, interpersonal engagement underscores its importance in strengthening community bonds and enhancing the quality of life in neighborhoods.

2.4. Neighborhood Recreational Facilities and Social Interactions

Neighborhood parks are vital recreational spaces that enhance residents' quality of life, supporting both active and passive activities (Von Kursell 1997; Malek et al. 2012). Active recreation includes activities like sports or hiking, while passive recreation involves less physical engagement, such as reading or enjoying nature. Defined as leisure spaces within residential areas, these parks promote social interaction and daily activities without cost (Cui et al., 2024). Key features typically include playgrounds, sports courts, jogging paths, shelters, rest areas, restrooms, and parking facilities.

To foster social interaction in urban settings, intentional design strategies for public spaces are essential. These spaces can engage with individuals' sociocultural dynamics and encourage communal activities (Mamaghani et al. 2015). Bekker et al. (2010) highlight the use of interactive play tools in recreational areas to promote social and physical engagement, facilitating collaborative play and strengthening social bonds. Figure 1 illustrates Bekker's concept of designing playful environments to enhance neighborhood interactions.

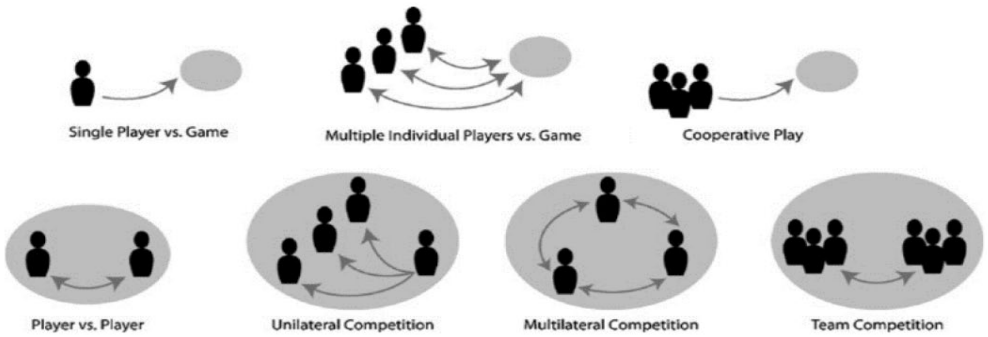

Figure 1. Players social interaction patterns (Source: Bekker et al. 2010).

To summarize, the presence of well-designed physical open spaces is critical for fostering social interaction among neighborhood members. Neighborhood parks play a pivotal role in urban development, enhancing social cohesion and cultural connections (Kara et al. 2011). The reviewed literature establishes a strong correlation between open spaces and the social interactions of residents, highlighting the importance of accessible and functional recreational facilities in building vibrant communities. This research investigates the factors influencing social interactions among users of neighborhood recreational facilities, aiming to provide actionable insights for enhancing their design and usability. Figure 2 below illustrates examples of such facilities, showcasing their potential to support communal activities and improve neighborhood livability.

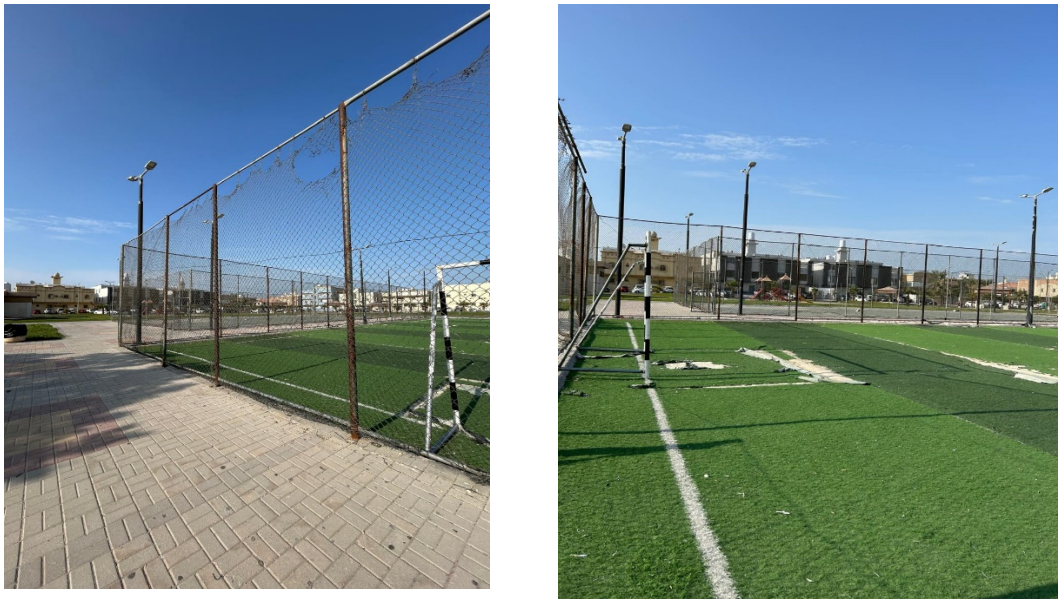

***Figure 2*:** Neighborhood Recreational Facilities (Source: Author).

2.5. Factors Influencing Social Interaction among Users in Open Public Spaces

This section is structured into two primary segments: The Theoretical Framework delves into pertinent literature regarding the factors that impact social interaction, while the Case Study Review scrutinizes how these factors have manifested in diverse global settings.

Theoretical Framework

Several studies emphasize that social interaction requires an appropriate context to occur. A range of physical and environmental factors significantly influence social interaction in open public spaces, such as recreational facilities. These include the design, spatial elements, proximity, location, and amenities available within the area (Godbey (2009). Additionally, the variety and characteristics of recreational and physical activities further enhance the role of open spaces in fostering interaction among residents.

Research consistently highlights the importance of physical environments in shaping social interaction (Hertzberger 2010; Beske 2007; Şensoy 2012; Montgomery 2013; Kara 2022). These environments can support various forms of social interaction, ranging from passive engagements, such as casual conversations, to active exchanges, such as group sports or organized activities (Hertzberger 2010). Space design directly or indirectly influences the likelihood of interaction by affecting the duration of users' presence and their willingness to engage with others.

Non-Environmental Factors

Non-physical factors also play a significant role in shaping social interactions. Social and economic homogeneity within neighborhoods has been identified as a crucial determinant, with more homogeneous communities tending to exhibit higher levels of interaction (Talen 1999). Homeownership is another influential factor, as homeowners are generally more likely to interact with neighbors compared to renters (Roberts 1984). Farshidi (2016) presents an extensive array of non-environmental factors that impact social interaction, encompassing demographics such as age, gender, marital status, and ethnicity; household composition factors like tenure type, family size, and the number of children; community stability elements including length of residency and intent to stay in the area; socioeconomic status indicators such as employment, education, and household income; employment patterns like working hours and proximity to workplaces; and transportation aspects such as mode of transport and ownership of vehicles. Farshidi (2016) also identifies physical proximity, visual attractiveness, privacy, affordance (ease of use), and density as key factors that significantly affect interactions in shared spaces. These factors influence the quality and frequency of social engagement among residents.

Case Studies

Case studies from diverse global settings offer additional perspectives on how both physical and non-environmental factors influence social interaction within neighborhoods. For instance, research indicates that in urban parks, thoughtfully planned walking paths and seating layouts can enhance chances for

social engagement (Hertzberger 2010). Similarly, within community centers, the incorporation of multi-functional spaces encourages a range of activities that contribute to nurturing social cohesion (Montgomery 2013).

Salih and Ismail (2017) conducted a comprehensive study to identify the environmental and physical factors that influence social interaction in open spaces. The primary objective of the research was to explore the key elements that enhance social interaction in green open spaces by highlighting the importance of spaces that meet specific criteria for fostering social and community engagement. Utilizing a content analysis approach, the study reviewed over 25 sources, including academic articles, research papers, and books, to provide a robust understanding of the topic.

The findings emphasize that an appropriately designed setting is crucial for facilitating social interaction. Green open spaces that incorporate essential elements, such as thoughtful design, engaging activities, accessibility, user-centered features, and effective management, are pivotal in promoting positive social interactions. Key factors identified include:

- Design, Aesthetics, and Visual Appeal: The visual attractiveness of open spaces significantly enhances their usability and promotes interactions.
- Features and Qualities of Open Spaces: Well-designed components, such as shaded seating areas and interactive installations, encourage engagement.
- Activities and Play Equipment: Recreational facilities cater to diverse age groups, fostering community participation.
- Accessibility: Physical accessibility and proximity to users ensure equitable usage.
- Connectivity: Integration of open spaces into the broader urban fabric enhances usability and social vibrancy.
- User Characteristics and Preferences: Understanding the demographic and cultural preferences of users supports inclusivity.
- Management and Maintenance: Regular upkeep ensures functionality and aesthetic appeal.
- Safety and Security: A secure environment fosters a sense of comfort and encourages prolonged use.

Further supporting evidence by Nasar and Julian (1995), building on Jacobs' (1961) ideas, suggests that areas with mixed land use promote increased social contact, walkability, and a strong sense of community, which are conducive to informal interactions. Similarly, other researchers (Holland et al. 2007; Mean and Tims 2005; Shaftoe 2012) have highlighted that well-maintained spaces, strategic location, accessibility, and the availability of engaging activities are critical for enhancing social vibrancy and inclusivity.

Moreover, studies underscore that environmental quality, aesthetic appeal, experiential opportunities (Peters et al. 2010), and the availability of high-quality public open spaces (Lee and Maheswaran 2011) significantly influence social cohesion. These factors collectively enhance the quality of life and provide opportunities for meaningful interactions, ultimately strengthening community bonds. This body of research illustrates the intricate interplay between environmental, physical, and social factors in fostering vibrant and socially cohesive open spaces, offering valuable insights for urban planners and designers.

Social success and inclusion are influenced significantly by design-related factors (Billingham 2002; Carmona 2021; Gehl 2013; Holland et al. 2007; Mean and Tims 2005). Elements such as the diversity of physical forms, sufficient pedestrian circulation (Law 2000), and the thoughtful arrangement of components (Elsheshtawy 2015) play a critical role in fostering interpersonal relationships. Conversely, physical barriers can obstruct social interaction, emphasizing the need to carefully evaluate the balance between visual connectedness and privacy (Porta 1999). Physical characteristics, such as visual appeal, cleanliness, and safety, also significantly impact the likelihood of social interaction. Studies have shown that aesthetic qualities (Rad and Ngah 2013; Sugiyama et al. 2009) and a sense of safety and security (Pasaogullari and Doratli 2004) enhance the attractiveness of public spaces, encouraging community members to engage socially.

Moreover, spaces that cater to various community needs—such as areas for daily essentials, transitional spaces, sociability zones, and quiet solitude areas—substantially affect the frequency of social interactions among residents (Cattell et al. 2008). These spaces provide opportunities for spontaneous encounters, planned activities, and reflective solitude, ensuring inclusivity for all demographic groups. The factors influencing social interaction in neighborhood recreational facilities are summarized in Table 2 below, providing a comprehensive framework for designing spaces that promote community engagement and cohesion. Perceptions of public open spaces vary across individuals and socio-economic groups, influencing usage patterns and forecasts. Unique constraints and preferences shape psychological accessibility, potentially leading to a decline in use (Park, 2017). Additionally, physical attributes play a crucial role in fostering opportunities for social interactions, ranging from casual encounters to deeper engagements (Hertzberger, 2010). These attributes also shape residents'

perceptions of their neighborhoods, influencing behaviors and choices. As a result, psychological accessibility impacts the use of public open spaces in residential areas (Park, 2017). This suggests that incorporating diverse physical attributes in public open space design can enhance social interaction and foster greater inclusion among residents.

Table 2. Key Factors Influencing Social Interaction in Neighborhood Open Public Spaces.

Social Interaction Influencing Factors	**References**
▪ Connectivity of open spaces and parks in neighborhood design Mixed land use ▪ High-density neighborhoods	Jacobs (1961)
▪ Physical design and layout patterns of open spaces ▪ Location of open spaces	Karuppannan and Sivam (2011)
▪ Presence and size of appropriate areas for interaction ▪ Design of physical elements (e.g., street furniture) ▪ Appearance, visibility, and privacy of locations	Skjaeveland and Garling (1997)
▪ Homeownership (owner vs. rental tenure)	Yamamura (2011); Roberts (1984)
▪ Neighborhood density	Freeman (2001)
▪ Distance and proximity of open spaces ▪ Facilities and recreational activities in open spaces	Godbey (2009)
▪ Demographics (age, gender, marital status, ethnicity) ▪ Household composition (size, type, number of children) ▪ Community stability (residency duration, intent to remain) ▪ Socioeconomic status (education, employment, income) ▪ Employment patterns (working hours, workplace proximity) ▪ Transportation (mode and vehicle ownership) ▪ Physical proximity and connectivity of communal spaces	Farshidi (2016) Wan and Ng (2018)
▪ Design, visual appeal, and imagery of open spaces ▪ Integration of open spaces with surrounding areas	Salih and Ismail (2017)
▪ Management and maintenance of open spaces	Salih and Ismail (2017); Holland et al. (2007); Shaftoe (2012)
▪ Ensuring safety and security of open spaces	Salih and Ismail (2017); Pasaogullari and Doratli (2004)
▪ Social activities and engagement within spaces	Carmona(2021); Dines et al. (2006); Gehl (2013)
▪ High-quality public open spaces	Lee and Maheswaran (2011)
▪ Aesthetic appeal and cleanliness of spaces	Peters et al. (2010); Bigdeli Rad and Ngah (2013); Sugiyama et al. (2009)
▪ Physical attributes and attractiveness of spaces	Bigdeli Rad and Ngah (2013); Sugiyama et al. (2009)

▪ Dedicated areas for daily necessities, socialization, and solitude	Cattell et al. (2008) Olukoya and Atanda (2020) Atanda and Öztürk (2020)

The factors influencing social interaction can be categorized into three primary dimensions:

- Demographic Characteristics of Neighborhood Residents (DCNR)
- Physical Characteristics of Recreational Facilities (PCRF)
- Social Sustainability Characteristics (SSC)

The following case studies illustrate the impact of these factors on social interactions in open public spaces across different global contexts.

Case Study 1: Raman (2010)

In a study by Raman exploring the relationship between design, layout, and social interaction in six distinct neighborhoods in the United Kingdom with varying densities and configurations, a mixed-method approach was employed. Questionnaire surveys were utilized to gauge community cohesiveness and map social networks, while observational surveys were conducted to evaluate social activities, pedestrian flow, and the built environment's quality. The study revealed that physical characteristics, spatial arrangement, and architectural design significantly impact social networks, interaction frequency, and connection quality. It was found that high-rise residential structures can impede physical proximity and limit social interactions, despite the presence of open spaces. Conversely, well-connected communal areas, such as recreational spaces within neighborhoods, were observed to facilitate more frequent and meaningful social interactions. Additionally, the study highlighted the importance of visual connectivity among residences in enhancing social networks within these communities.In summary, the presence of well-designed, connected open spaces significantly enhances social interaction, while high-rise buildings, despite providing open spaces, reduce such interactions due to their restrictive layouts.

Case Study 2: Salih and Ismail (2018)

This study used a survey of 270 respondents to examine factors affecting social interactions in Baghdad parks. Key elements evaluated included design quality, diverse activities, accessibility, safety, and maintenance. Findings highlighted those well-maintained parks with thoughtful design, varied activities, and effective safety measures enhance social interaction. Conversely, high crowd density, noise, and poor management negatively impact engagement. The study concludes that accessible, well-managed parks are vital for fostering community interaction, while overcrowding and neglect deter meaningful connections.The insights from both studies underscore the critical importance of open space quality and design in facilitating social interaction. While physical factors such as layout, connectivity, and aesthetics play a prominent role, non-physical aspects like safety, administration, and crowd management are equally significant. Urban planners and designers must holistically integrate these factors to create environments that support vibrant social networks.

Similarly, Almansor (2021) examined factors influencing social interaction in communal spaces within Barsha, Iraq. Using a literature review and expert analysis, the study identified key factors such as safety, community sense, privacy, accessibility, climate-responsive design, maintenance, education, gender, employment, and familial or social ties within neighborhoods. In Saudi Arabia, Sammakieh et al. (2021) investigated factors influencing social interaction in Jeddah's public spaces. Key factors included accessibility, safety, landscape features, urban design, sensory stimuli, stress-free environments, recreation, comfort, pedestrian-friendly layouts, mixed-use integration, ventilation, multifunctionality, and service availability. These elements fostered socially vibrant and inclusive spaces.

Lastly, Mangunsong (2018) examined determinants influencing the quality of social interaction in neighborhood parks across five municipalities in Jakarta. Using descriptive and correlational analyses, the study evaluated 25 local parks designed to facilitate social interaction. The findings revealed that while park design itself had no direct impact, factors such as the beauty and harmony of the parks, maintenance standards, cleanliness, and environmental health were significantly influential in promoting social interactions among residents.The extracted factors from these studies are summarized in Table 3, which outlines the key elements affecting social interactions in public open spaces across diverse contexts.

Table 3. Key Factors Influencing Social Interaction in Neighborhood Open Public Spaces (Case Study-Based).

Case Study	Extracted Factors influence social interaction in public open space	Reference
United Kingdom	▪ Well-connected common area ▪ Quality Location of the public open space ▪ High Rise Residential Buildings (Taller tower blocks) (Negative influence on social interaction among residents in the neighborhood recreational facilities)	Raman (2010)
Iraq-Basra	▪ Education status ▪ Gender ▪ Employment status ▪ The existence of relations in the same neighborhood ▪ Accessibility ▪ Climate responsive design ▪ Maintenance ▪ Location of public open spaces ▪ Safety and security ▪ Sense of community ▪ Privacy	Almansor (2021)
Iraq-Baghdad	▪ Design and image of the parks ▪ High quality and diverse activities of parks ▪ Accessibility ▪ Administration (Management) ▪ Connectivity ▪ Crowd density and noise (Negative influence on social interaction in the neighborhood recreational facilities) ▪ Safety and security	Salih and Ismail (2018)
Saudi Arabia – Jeddah City	▪ Landscape features (Lighting, Finishing) ▪ Space morphology (Urban form), Size, Shape and others ▪ Relaxation and recreational activities ▪ Pedestrian-friendly design ▪ Physical and visual accessibility ▪ Safety measures ▪ Ventilation ▪ Multifunctionality ▪ Vending outlets (Food, drinks & others) ▪ Service availability and management, such as toilets ▪ Hazard protection ▪ Connectedness to the city ▪ Positive sensory stimuli ▪ Stress-free environment ▪ Comfort ▪ Encouraging communication (Psychologically) ▪ Safety and security	Sammakieh et al. (2021)
Indonesia – Jakarta	▪ Beauty and harmony of neighborhood park ▪ Maintenance of neighborhood park ▪ Cleanliness and Environmental Health of neighborhood park	Mangunsong (2018)

3. Material and Methods

The primary objective of this review is to examine the factors influencing social interaction in open public spaces, such as neighborhood recreational facilities. The review demonstrates that open public spaces designed to meet specific criteria are essential for fostering and enhancing social interaction among residents.

Data Collection and Analysis Data Collection

The data collection process involved a comprehensive and systematic online search to identify literature relevant to neighborhoods, neighborhood open public spaces, social sustainability, and social interaction. To ensure the inclusion of high-quality sources, databases such as Scopus, Web of Science, and Google Scholar were searched using predefined keywords and Boolean operators. The selection process followed clearly defined inclusion and exclusion criteria, prioritizing peer-reviewed journal articles, books, technical reports, and conference proceedings. Studies lacking empirical data or not directly addressing social interaction in neighborhood public spaces were excluded.

The study also incorporated a theoretical exploration of factors influencing social interaction in neighborhood open public spaces, synthesizing findings from disciplines such as urban planning, sociology, and environmental psychology. Additionally, a case study analysis was conducted to compare how various global contexts shape social interaction. Case studies were selected based on criteria such as geographical diversity, cultural context, and policy framework, ensuring a broad representation of urban environments. Each case was examined based on spatial layout, accessibility, design interventions, and user behavior to identify commonalities and differences in fostering social interaction.

For data analysis, two key approaches were employed. Content analysis was used to identify and quantify recurring concepts, phrases, and themes within the collected data, aiding in the discovery of patterns aligned with the study's objectives. Additionally, case study analysis, as outlined by Kaarbo and Beasley (1999), systematically compared multiple cases to reveal relationships, patterns, and variations across different contexts. This approach, widely used across disciplines, provided valuable insights into how different factors influence social interaction.The selection of case studies was guided by alignment with the research objectives and data accessibility. By integrating theoretical research with practical case study comparisons, this two-phase methodology offers a comprehensive understanding of the factors shaping social interaction in neighborhood open public spaces. The findings aim to inform better design and management practices to enhance social sustainability and community cohesion.

4. Results and Discussion

This study analyzed case studies to explore factors influencing social interaction in public spaces, parks, and recreational facilities, revealing significant variations across countries due to differing social and cultural contexts. In Iraq, demographic factors like gender and education were pivotal, while physical attributes of recreational facilities were the most influential overall. Key factors identified include accessibility, proper maintenance, climate-responsive designs, diverse activities, and amenities such as vending outlets and effective management systems.

Several case studies, including those from Iraq, Jeddah City (Saudi Arabia), and the United Kingdom, highlighted the importance of connectivity between public open spaces and residential neighborhoods. This connectivity fosters greater accessibility and integration, significantly enhancing social interactions among neighborhood residents.The social sustainability characteristic category emphasized the role of safety and security systems in encouraging social interaction, particularly in Iraq and Jeddah. Well-designed safety measures contribute to user comfort and trust, motivating residents to visit and interact within these spaces. The study underscores the necessity of addressing potential threats to user well-being in public spaces to create environments conducive to social interaction.

In conclusion, this research highlights the importance of considering both demographic characteristics (e.g., gender and education) and physical factors (e.g., design, accessibility, and maintenance) in promoting social interaction in public open spaces. Based on the findings from the literature and case studies, Tables 4, 5, and 6 present the final list of factors and sub-variables influencing social interaction among neighborhood residents in public open spaces, including neighborhood recreational facilities.

Table 4. DCNR Factors Influencing Social Interaction in Neighborhood Recreational Facilities.

Category	Factors	Sub-variables	Sub-variables References
DCNR	Tenure type	-	-
	Age group	-	-

	Gender	-	-
	Marital status	-	-
	Number of children in the family	-	-
	Job status	-	-
	Education level	-	-
	Household income	-	-
	Working hours	-	-
	Transportation	-	-
	The existence of relations (Relatives) in the same residential neighborhood	-	-

Table 5. PCRF Factors Influencing Social Interaction in Neighborhood Recreational Facilities.

Category	**Factors**	**Sub-variables**	**Sub-variables References**
PCRF	Availability and management of facilities	▪ Availability & management of the toilets in the neighborhood recreational facilities ▪ Availability and management of parking facilities	Sammakieh et al. (2021)
	Types and characteristics of recreational and physical activities	▪ Provision of children's playground in the neighborhood recreational facilities ▪ Provision of football fields in the neighborhood recreational facilities. ▪ Provision of jogging routes in the neighborhood recreational facilities. ▪ Provision of rest area in the neighborhood recreational facilities.	Cui et al. (2024)
	Visual connectivity (Permeability)	▪ Visual controllability (The transparency of the neighborhood recreational facilities with very high level of visibility) ▪ Visibility of neighborhood recreational facility (Showcasing clearly the activities and options of the recreational facilities for the neighborhood residents)	Farshidi (2016)
	Affordance (Place Capacity)	▪ Capacity of neighborhood recreational facilities that provide access to a diverse range of activities	Farshidi (2016)
	Accessibility	▪ The proximity of the neighborhood recreational	Almansor (2021)

		facilities to users in the neighborhood ▪ The accessibility to neighborhood recreational facilities to both genders ▪ The number of females who have access to neighborhood recreational facilities. ▪ The number of males who have access to neighborhood recreational facilities. ▪ The number of children who have access to neighborhood recreational facilities. ▪ The number of elderlies who have access to neighborhood recreational facilities. ▪ The number of disabled who have access to neighborhood recreational facilities. ▪ Connectivity of parks into the neighborhood design	Shirazi and Keivani (2019) Farshidi (2016)
	Maintenance	▪ Periodic maintenance of neighborhood recreational facilities	Almansor (2021)
	Climate responsive design	▪ An appropriate design for the environmental climate of the city ▪ The selection of construction materials is appropriate for the location and area. ▪ Provision of shelter/shaded areas in the neighborhood recreational facilities (Coverage from sun or rain)	Almansor (2021) Chang (2025)
	Landscape features (Aesthetic appeal)	▪ Provision of suitable finishing materials, lighting, and furnishings within neighborhood recreational facilities.	Sammakieh et al. (2021)
	Safety measures	▪ Availability of the railings and fire suppression systems within the neighborhood recreational facilities.	Sammakieh et al. (2021)
	Vending outlets	▪ Availability of the food & drinks Kiosks in the neighborhood recreational facilities	Sammakieh et al. (2021)
	Hazard protection	▪ Protection of contact with potentially dangerous substances that might lead to Health damage	Sammakieh et al. (2021) Ahmed (2012)

		and potential threats to the neighborhood recreational facilities user's safety. ▪ Cleanness of the neighborhood recreational facilities (Regular garbage collection).	

Table 6. SSC Factors Influencing Social Interaction in Neighborhood Recreational Facilities.

Category	**Factors**	**Sub-variables**	**Sub-variables References**
SSC	Density	▪ The number of neighborhood recreational facilities users. ▪ The number of residents per house. ▪ The population density of the residential neighborhood relative to its total area of the neighborhood	Almansor (2021)
	Characteristics and interests of users (Neighborhood Residents)	-	-
	Privacy	▪ Perceived privacy and comfort in using neighborhood recreational facilities ▪ Physical or visible barriers (trees and fences).	Almansor (2021)
	Safety and security	▪ The incidence of crime or the prevalence of conflict in the residential neighborhood ▪ Percentage of neighborhood residents who feel safe in their neighborhood recreational facilities during daylight and nighttime.	Almansor (2021)
	Sense of community	▪ Engagement in social activities and community affairs of the residential neighborhood by using social media, WhatsApp group and others (Participatory decision-making pertinent to the neighborhood)	Almansor (2021)

5. Conclusion

This study underscores the crucial role of well-designed public open spaces in fostering social interaction among neighborhood residents. Key factors such as thoughtful design, diverse activities, accessibility, safety, effective management, and regular maintenance are essential for promoting meaningful engagement in parks and other shared areas. Neighborhood recreational facilities, in particular, serve as vital spaces for socialization, cultural exchange, and community-building, making them integral to urban social sustainability. The findings emphasize that a city's overall sustainability depends on the well-being of its neighborhoods, highlighting the need to address local challenges to achieve broader urban sustainability goals.

The study identifies three primary categories of factors influencing social interaction: demographic characteristics of neighborhood residents, physical characteristics of recreational facilities, and social

sustainability characteristics. Case study comparisons reveal significant regional variations in these factors, shaped by weather conditions, cultural norms, and socioeconomic characteristics. This underscores the necessity for context-specific approaches when planning and designing public spaces.

While providing valuable insights, the study has limitations. The reliance on secondary data may restrict contextual depth, and the proposed framework has not been empirically validated in specific neighborhoods or regions. Future research should conduct empirical investigations across diverse geographic and cultural settings to refine the framework. Longitudinal studies could further explore the long-term impacts of public open space design on social interaction and community well-being. Additionally, advancements in smart infrastructure and technology could enhance public space usability. Given the variation in social interaction factors across contexts, expert-based surveys are essential to identify the specific influences within particular settings.

Despite its significance in urban sustainability, social sustainability remains the least explored pillar in scholarly research. This study addresses this gap by positioning social interaction as a key indicator and advocating for its integration into urban planning and policy frameworks. By emphasizing the need for tailored, community-driven public space design, the study contributes to sustainable urban development. Engaging residents in the planning process ensures accessibility, safety, and inclusivity, while integrating social and environmental sustainability enhances long-term urban resilience. These insights offer a foundation for policymakers, urban planners, and designers to create vibrant, socially cohesive neighborhoods that support broader sustainability objectives.

Conflict of Interest Statement

The authorshave no competing interests to declare.

References

Abbaszadeh, S 2009 Reinforcing social interaction among Persian neighborhood communities in new high-rise residential development. Unpublished thesis (PhD), Universiti Putra Malaysia.

Almansor, N2021 Social sustainability in residential urban environments: single-family house neighbourhoods in Basra, Iraq. Available at https://stax.strath.ac.uk/concern/theses/pg15bf392 [Last accessed 12 December 2024].

Assefa, G and Frostell, B 2007 Social sustainability and social acceptance in technology assessment: A case study of energy technologies. Technology in society, *29*(1): 63-78. DOI: https://doi.org/10.1016/j.techsoc.2006.10.007.

Atanda, JO and Öztürk, A 2020 Social criteria of sustainable development in relation to green building assessment tools. Environment, Development and Sustainability, *22*: 61-87. DOI: https://doi.org/10.1007/s10668-018-0184-1.

Bekker, T, Sturm, J and Eggen, B 2010 Designing playful interactions for social interaction and physical play. Personal and Ubiquitous Computing, 14: 385-396. DOI: https://doi.org/10.1007/s00779-009-0264-1.

Beske, JL 2007 How urban form effects sense of community: A comparative case study of a traditional neighborhood and conventional suburban development in Northern Virginia. Unpublished thesis (PhD), Iowa State University.

Billingham, Jand Cole, R2002 The good place guide: Urban design in Britain and Ireland. Cotswold district, Gloucestershire, England: Batsford.

Bramley, G, Dempsey, N, Power, S and Brown, C 2006 What is 'social sustainability', and how do our existing urban forms perform in nurturing it? In: Sustainable Communities and Green Futures' Conference, Bartlett School of Planning, University College London, London, April 2006, pp. 1-40.

Can, I 2012 In-between space and social interaction: a case study of three neighbourhoods in Izmir. Unpublished thesis (PhD), University of Nottingham.

Carlisle, RK and Stankovich, AM 2014 Aging in places: Roles of parks, recreation and open space in aging friendly placemaking. Available at https://cdn.ymaws.com/www.mparks.org/resource/collection/099A0F9F-56F6-4DF2-BFA1-FAC42C2EDCD0/AgingInPlaces.pdf [Last accessed 24March 2025].

Carmona, M 2021 Public places urban spaces: The dimensions of urban design, New York, NY: Routledge.

Cattell, V, Dines, N, Gesler, W and Curtis, S 2008 Mingling, observing, and lingering: Everyday public spaces and their implications for well-being and social relations. Health andPlace, 14(3): 544-561. DOI: https://doi.org/10.1016/j.healthplace.2007.10.007.

Chang, X 2025 Adapting Architecture to Climate: Exploring Climate-Responsive Strategies Across US Cities. International Journal of Engineering Advances, 2(1): 1-16.DOI: https://doi.org/10.71222/qca5ng14.

Chen, Y, Liu, T and Liu, W 2016 Increasing the use of large-scale public open spaces: A case study of the North Central Axis Square in Shenzhen, China. Habitat International, 53: 66-77. DOI: https://doi.org/10.1016/j.habitatint.2015.10.027.

Choguill, CL 2008 Developing sustainable neighbourhoods. Habitat International, 32(1): 41-48. DOI: https://doi.org/10.1016/j.habitatint.2007.06.007.

Colantonio, A 2010 Urban social sustainability themes and assessment methods. Proceedings of the Institution of Civil Engineers-Urban Design and Planning, 163(2): 79-88. DOI: https://doi.org/10.1680/udap.2010.163.2.79.
Cui, H, Maliki, NZ and Wang, Y 2024 The Role of Urban Parks in Promoting Social Interaction of Older Adults in China. Sustainability, 16(5): 2088. DOI: https://doi.org/10.3390/su16052088.
Cuthill, M 2010 Strengthening the 'social' in sustainable development: Developing a conceptual framework for social sustainability in a rapid urban growth region in Australia. Sustainable Development, 18(6): 362-373. DOI: https://doi.org/10.1002/sd.397.
Dave, S 2011 Neighbourhood density and social sustainability in cities of developing countries. Sustainable Development, 19(3): 189-205. DOI: https://doi.org/10.1002/sd.433.
Dempsey, N 2006 The Influence of the quality of the built environment on social cohesion in English neighbourhoods. Unpublished thesis (PhD), Oxford Brookes University.
Dempsey, N, Bramley, G, Power, S and Brown, C 2011 The social dimension of sustainable development: Defining urban social sustainability. Sustainable Development, 19(5): 289-300.DOI: https://doi.org/10.1002/sd.417.
Dempsey, N, Brown, C and Bramley, G 2012 The key to sustainable urban development in UK cities? The influence of density on social sustainability. Progress in Planning, 77(3): 89-141. DOI: https://doi.org/10.1016/j.progress.2012.01.001.
Dines, N, Cattell, V, Gesler, WM and Curtis, S 2006 Public spaces, social relations and well-being in East London. Bristol, England: Policy Press.
Doda, Z 2005 Introduction to sociology. Lecture notes for health science students. The Carter Center, Ethiopia:Hawassa University/ Ethiopian Public Health Traning Initiative/the Carter Center.
Elsheshtawy, Y 2015 Observing the public realm: William Whyte's the social life of small urban spaces. Built Environment, 41(3): 399-411. DOI: https://doi.org/10.2148/benv.41.3.399
Farshidi, A 2016 Impact of design on social interaction within urban residential developments in Scotland. Unpublished thesis (PhD), Robert Gordon University.
Freeman, L 2001 The effects of sprawl on neighborhood social ties: An explanatory analysis. Journal of the American Planning Association, 67(1): 69-77.DOI: https://doi.org/10.1080/01944360108976356.
Gehl, J, Svarre, B, Gehl, J and Svarre, B 2013 Public space, public life: an interaction. How to study public life, 1-8. DOI: https://doi.org/10.5822/978-1-61091-525-0_1.
Godbey, G 2009 Outdoor recreation, health, and wellness: Understanding and enhancing the relationship. DOI: http://dx.doi.org/10.2139/ssrn.1408694.
Hamiduddin, I 2015 Social sustainability, residential design and demographic balance: Neighbourhood planning strategies in Freiburg, Germany. Town Planning Review, 86(1): 29-52. DOI: https://doi.org/10.3828/tpr.2015.3.
Hemani, S and Das, AK 2016 Humanising urban development in india: Call for a more comprehensive approach to social sustainability in the urban policy and design context. International Journal of Urban Sustainable Development, 8(2): 144-173. DOI: https://doi.org/10.1080/19463138.2015.1074580.
Henning, C and Lieberg, M 1996 Strong ties or weak ties? Neighbourhood networks in a new perspective. Scandinavian Housing and planning research, 13(1): 3-26. DOI: https://doi.org/10.1080/02815739608730394.
Hertzberger, H 2010 Space and the Architect: Lessons in Architecture 2. Rotterdam: 010 Publishers
Hirschfield, A and Bowers, KJ 1997 The effect of social cohesion on levels of recorded crime in disadvantaged areas. Urban Studies, 34(8): 1275-1295. DOI: https://doi.org/10.1080/004209897563.
Holland, C, Clark, A, Katz, J and Peace, S 2007 Social interactions in urban public places. Policy Press.
Jacobs, J 1961 Jane jacobs. The Death and Life of Great American Cities, 21(1): 13-25.
Jenks, M and Dempsey, N 2007 Defining the neighbourhood: Challenges for empirical research. Town Planning Review, 78(2): 153-177. DOI: https://doi.org/10.3828/tpr.78.2.4.
Kaarbo, J and Beasley, RK 1999 A practical guide to the comparative case study method in political psychology. Political psychology, 20(2): 369-391. DOI: https://doi.org/10.1111/0162-895X.00149.
Kara, B, Tuncay, HE and Deniz, B 2011 Investigating recreational qualities of the parks in Aydın. Procedia-Social and Behavioral Sciences, 19: 158-164. DOI: https://doi.org/10.1016/j.sbspro.2011.05.119.
Kara, E and Yildiz Ozkan, D 2022 The effects of environmental factors on the social interaction of children in need of protection in outdoor living spaces. *Archnet-IJAR:* International Journal of Architectural Research, 16(1): 69-89. DOI: https://doi.org/10.1108/ARCH-06-2021-0154.
Karuppannan, S and Sivam, A 2011Social sustainability and neighbourhood design: an investigation of residents' satisfaction in Delhi. Local Environment, 16(9): 849-870. DOI: https://doi.org/10.1080/13549839.2011.607159.
Khan, R 2016 How frugal innovation promotes social sustainability. Sustainability, 8(10): 1034. DOI:https://doi.org/10.3390/su8101034.
Khavarian-Garmsir, AR, Sharifi, A, Hajian Hossein Abadi, M and Moradi, Z 2023 From garden city to 15-minute city: a historical perspective and critical assessment. Land, 12(2):512. DOI: https://doi.org/10.3390/land12020512.
Law, KM 2000 Towards more user-friendly public open spaces in high density areas. Unpublished thesis (PhD),University of Hong Kong, Pokfulam, Hong Kong SAR.
Lee, AC and Maheswaran, R 2011 The health benefits of urban green spaces: a review of the evidence. Journal of public health, 33(2): 212-222. DOI: https://doi.org/10.1093/pubmed/fdq068.

Malek, NA, Mariapan, M and Shariff, MKM 2012 The making of a quality neighbourhood park: A path model approach. Procedia-social and behavioral sciences, 49: 202-214. DOI: https://doi.org/10.1016/j.sbspro.2012.07.019.
Mamaghani, NK, Asadollahi, AP and Mortezaei, SR 2015 Designing for improving social relationship with interaction design approach. Procedia-Social and Behavioral Sciences, 201: 377-385. DOI: https://doi.org/10.1016/j.sbspro.2015.08.190/.
Mangunsong, NI 2018 Factors affecting quality of social interaction park in Jakarta. In: IOP Conference Series: Earth and Environmental Science (Vol. 106, No. 1, p. 012055). IOP Publishing. DOI: https://doi.org/10.1088/1755-1315/106/1/012055.
Marmot, M 2011 Social determinants and the health of Indigenous Australians. Med J Aust, 194(10): 512-513. DOI: 10.5694/j.1326-5377.2011.tb03086.x.
Martí, P, Serrano-Estrada, L, Nolasco-Cirugeda, A and Baeza, JL 2022 Revisiting the spatial definition of neighborhood boundaries: functional clusters versus administrative neighborhoods. Journal of Urban Technology, 29(3): 73-94. DOI:https://doi.org/10.1080/10630732.2021.1930837.
Mean, M and Tims, C 2005 People make places: Growing the public life of cities. Demos.
Mendoza-Graf, A, MacCarthy, S, Collins, R, Wagner, LV and Dubowitz, T 2023 Exploring differences in perceptions of gentrification, neighborhood satisfaction, social cohesion, and health among residents of two predominantly African American Pittsburgh neighborhoods (n= 60). BMC Public Health, 23(1): 2137. DOI: https://doi.org/10.1186/s12889-023-16970-4.
Montgomery, C 2013 Happy city: Transforming our lives through urban design. Penguin UK.
Nasar, JL and Julian, DA 1995 The psychological sense of community in the neighborhood. Journal of the American planning Association, 61(2): 178-184. DOI: https://doi.org/10.1080/01944369508975631.
Neamţu, B 2012 Measuring the social sustainability of urban communities: The role of local authorities. Transylvanian Review of Administrative Sciences, 8(37): 112-127.
Olukoya, OA and Atanda, JO 2020 Assessing the social sustainability indicators in vernacular architecture—application of a green building assessment approach. Environments, 7(9): 67. DOI: https://doi.org/10.3390/environments7090067.
Omann, I and Spangenberg, JH 2002 Assessing social sustainability. In: The 7th Biennial Conference of the International Society for Ecological Economics“ in Sousse, Tunisia, 6-9 March 2002.
Park, K 2017 Psychological park accessibility: a systematic literature review of perceptual components affecting park use. Landscape research, 42(5): 508-520. DOI:https://doi.org/10.1080/01426397.2016.1267127
Pasaogullari, N and Doratli, N 2004 Measuring accessibility and utilization of public spaces in Famagusta. Cities, 21(3): 225-232. DOI: https://doi.org/10.1016/j.cities.2004.03.003.
Peters, K, Elands, B and Buijs, A 2010 Social interactions in urban parks: Stimulating social cohesion?. Urban forestry & urban greening, 9(2): 93-100. DOI: https://doi.org/10.1016/j.ufug.2009.11.003.
Polèse, M, Stren, RE and Stren, R 2000 The social sustainability of cities: Diversity and the management of change. University of Toronto press.
Porta, S 1999 The community and public spaces: ecological thinking, mobility and social life in the open spaces of the city of the future. Futures, 31(5): 437-456. DOI: https://doi.org/10.1016/S0016-3287(99)00004-X.
Rad, VB and Ngah, I 2013 The role of public spaces in promoting social interactions. International journal of current engineering and technology, 3(1): 184-188.
Raman, S 2010 Designing a liveable compact city: Physical forms of city and social life in urban neighbourhoods. Built environment, 36(1): 63-80. DOI:https://doi.org/10.2148/benv.36.1.63.
Roberts, B 1984 To Dwell Among Friends: Personal Networks in Town and City. By Claude S. Fischer. University of Chicago Press, 1982. 451: 10.95.DOI: https://doi.org/10.1093/sf/63.1.297.
Ross, CE and Jang, SJ 2000 Neighborhood disorder, fear, and mistrust: The buffering role of social ties with neighbors. American journal of community psychology, 28: 401-420. DOI:https://doi.org/10.1023/A:1005137713332.
Sakip, SRM, Akhir, NM and Omar, SS 2015 Determinant factors of successful public parks in Malaysia. Procedia-Social and Behavioral Sciences, 170: 422-432.DOI:https://doi.org/10.1016/j.sbspro.2015.01.003.
Salih, S and Ismail, S 2018 Determining the factors affecting social interaction in the parks of Baghdad City, Iraq. *ArchNet-IJAR:* International Journal of Architectural Research, 12(3): 40.DOI: https://doi.org/10.26687/archnet-ijar.v12i3.1658.
Salih, SA and Ismail, S 2017 December. Criteria for public open space enhancement to achieve social interaction: A review paper. In: IOP Conference Series: Materials Science and Engineering (Vol. 291, No. 1, p. 012001). IOP Publishing.DOI https://doi.org/10.1088/1757-899X/291/1/012001.
Sammakieh, JK and Mohammed, MF 2021 Factors of Social Interaction at Waterfront Open Spaces-Jeddah Waterfront as a Case. Turkish Online Journal of Qualitative Inquiry, 12(7).
Şensoy, N 2012 Konut Yerleşimlerinde Dış Mekân Kullanımlarının Sosyal Etkileşim Yönünden İncelenmesi: TOKİ Atakent Sitesi Örneği (Ankara). Basılmamış Yüksek Lisans Tezi. Fen Bilimleri Enstitüsü, Düzce Üniversitesi, Düzce.
Shaftoe, H 2012 Convivial urban spaces:Creating effective public places. Routledge.
Shirazi, MR and Keivani, R 2019 The triad of social sustainability: Defining and measuring social sustainability of urban neighbourhoods. Urban Research & Practice, 12(4): 448-471. DOI: https://doi.org/10.1080/17535069.2018.1469039.
Skjaeveland, O and Garling, T1997 Effects of interactional space on neighbouring. *Journal of* Environmental Psychology, 17(3): 181-198. DOI: https://doi.org/10.1006/jevp.1997.0054.

Sugiyama, T, Thompson, CW and Alves, S 2009Associations between neighborhood open space attributes and quality of life for older people in Britain. Environment and behavior, 41(1): 3-21. DOI: https://doi.org/10.1177/0013916507311688.

Talen, E 1999 Sense of community and neighbourhood form: An assessment of the social doctrine of new urbanism. Urban studies, 36(8): 1361-1379. DOI: https://doi.org/10.1080/0042098993033.

TemeljotovSalaj, A, Johansen, A and Klieven, T A Scoping Review of Neighborhood's Social Sustainability Assessment Fra-meworks. Available at: https://www.researchgate.net/publication/368921284_A_Scoping_Review_of_Neighborhood's_Social_Sustainability_Assessment_Frameworks [Last accessed 12 December 2024]

Unger, DG and Wandersman, A 1985 The importance of neighbors: The social, cognitive, and affective components of neighboring. American journal of community psychology, 13: 139-169. DOI: https://doi.org/10.1007/BF00905726.

Van Diepen, AM and Musterd, S 2009 Lifestyles and the city: Connecting daily life to urbanity. Journal of Housing and the Built Environment, 24: 331-345. DOI: https://doi.org/10.1007/s10901-009-9150-4.

Vavik, T and Keitsch, MM 2010 Exploring relationships between universal design and social sustainable development: some methodological aspects to the debate on the sciences of sustainability. Sustainable development, 18(5): 295-305. DOI: https://doi.org/10.1002/sd.480.

Von Kursell, AA 1997 Replanning Urban Parks. Unpublished thesis, Technical University of Nova Scotia.

Wan, L and Ng, E 2018 Evaluation of the social dimension of sustainability in the built environment in poor rural areas of China. *Architectural Science Review*, 61(5): 319-326. DOI: https://doi.org/10.1080/00038628.2018.1505595

Woodcraft, S, Hackett, T and Caistor-Arendar, L 2011 Design for social sustainability: A framework for creating thriving new communities. Future Communities.

Yamamura, E 2011 How are social ties formed? Interaction of neighborhood and individual immobility. *The Journal of Socio-Economics*, 40(5): 472-474. DOI:https://doi.org/10.1016/j.socec.2010.09.008.