Social Cohesion in Urban Public Space: A Multi-method Inquiry into Conditional and Mechanistic Pathways

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Declaration

I hereby declare that this thesis is my own work and that it has not been submitted in any form for another degree or diploma at any university or other institution of tertiary education.

Jie Qi
24 September 2025

Dedication

To my mother.

Acknowledgment

I would like to express my appreciation to my first supervisor, Dr. Suvodeep Mazumdar, whose encouragement and belief in my potential gave me the courage to pursue this PhD journey. I am equally indebted to my second supervisor, Dr. Ana Cristina Vasconcelos, whose kind support and thoughtful advice have shaped and strengthened my work throughout. Together, their mentorship has been both a foundation and an inspiration.

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Some of the research presented in this dissertation has been published or is currently under peer review. The following is a list of publications related to the work within this thesis.

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Abstract

Public space functions as a socio–ecological system in which spatial form, social behaviour, and psychosocial meaning continuously interact. In this view, social cohesion is an emergent condition shaped by patterned encounters, perceptions of cohesion, and the affordances of the built environment. This research integrates three complementary analytical lenses to capture this multi-layered relationship. A sequential mixed-methods design links five studies was developed: a systematic literature review (SLR) and a structured policy review (SPR) to identify theoretical and policy gaps; behavioural mapping in Sheffield to quantify spatial–temporal patterns and clustering of co-presence and marginalisation; a UK–US survey testing moderation and mediation models linking spatial features, perceptions, interaction types, and five cohesion indicators; and focus groups exploring interpretive processes and lived experiences.

Findings show that physical affordances, normative structures, identity cues, safety perceptions, and temporal rhythms form an interdependent system shaping cohesion in public space, with effects varying across contexts and demographic groups. Particularly, our segmentation strategy from behaviour mapping, grounded in hierarchical information extrapolation rather than conventional spatial syntax descriptives that assume generic users and predict only aggregate flows. This methodological approach moves beyond pattern description to uncover the interaction between spatial form, social behaviour, and psychosocial meaning.

Integrating these behavioural patterns with psychosocial modelling and qualitative interpretation produces a conditional and mechanistic account of cohesion. This research advances socio–ecological theory by empirically linking material conditions to behavioural configurations and lived experience. In practice, it delivers a replicable analytical framework for evaluating inclusivity and guiding design, management, and governance interventions that strengthen social connectedness. These insights have direct application in urban policy, public space planning, and community development, providing place-based empirical evidence base for shaping environments that foster resilient, cohesive urban communities.

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Chapter 1

Introduction

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1.1 Research Context

Across contemporary urban discourse, public space has re-emerged as a central site of interest in efforts to promote social cohesion. From high-level policy strategies to grassroots placemaking initiatives, streets, parks, squares, and other shared spaces are increasingly positioned not only as infrastructures for movement and leisure, but as potential enablers of collective wellbeing, civic connection, and inclusive social life (Aelbrecht, 2016; Carmona, 2019a; UNDP, 2022). This shift is situated within a wider recognition of the challenges facing urban societies, particularly in the context of increasing cultural diversity, persistent inequalities, and growing concerns about social fragmentation (Cattell et al., 2008b; Mehta, 2014; Modie-Moroka et al., 2020). In response, public space is being tasked with the weight of social repair: to provide arenas for encounter across difference, to support informal sociability, and to cultivate a sense of mutual belonging in the everyday life of cities.

However, this ambition confronts several conceptual and empirical tensions. While public space is often framed as a vehicle for social cohesion, it can also serve as a terrain of exclusion, conflict, and symbolic boundary-making (Lofland, 1998; Zhu, 2015). Debates in urban inequality and spatial justice highlight how ostensibly open spaces frequently reproduce power through design, surveillance, and normative codes of use (Punter, 2007a). Despite the prominence of inclusivity in design and policy discourse, public space remains loosely defined and inconsistently applied, with limited understanding of how individuals actually experience or negotiate inclusion and exclusion in everyday settings (Amin, 2002). Another underexamined dimension of public space lies in its capacity to support everyday interaction, fleeting encounters, ambient sociability, and shared presence, that may foster cohesion in subtle but significant ways (Mehta, 2019b). Yet the conditions that enable such interactions, and their role in shaping social cohesion, remain poorly understood (Aelbrecht & Stevens, 2019).

Compounding these challenges is the layered nature of fragmentation in the urban public realm. Spatial fragmentation refers to the physical discontinuities produced by privatisation, redevelopment, or access barriers (Carmona, 2015). Social fragmentation emerges from broader processes of inequality, segregation, and marginalisation (M. J. Hickman & Mai, 2015). Perceptual fragmentation involves the subjective disconnection individuals may feel even when physically present in shared environments, manifesting as discomfort, invisibility, or alienation (Rishbeth et al., 2019). These forms of fragmentation do not operate in isolation; they intersect and reinforce one another, shaping the relational possibilities of public space in ways that often go unmeasured or unacknowledged.

Despite the prominence of public space in policy and planning agendas, from the UK government's recent English Devolution White Paper (The Ministry of Housing, Communities and Local Government, 2024) to the National Planning Policy Framework (NPPF), empirical evidence on how public space contributes to cohesion remains partial and inconclusive. The existing literature tends to focus on either spatial form or subjective perception, often failing to bridge the gap between the material design of environments, the social practices they afford, and the relational outcomes they generate (Qi et al., 2024). This disconnect limits both theoretical understanding and practical action. Without clear knowledge of the mechanisms through which cohesion emerges or fails in public space, interventions risk being aspirational rather than effective.

This thesis situates itself within this context of growing expectation and limited insight. It responds to calls for a more grounded, integrative, and empirically robust understanding of how public space functions as a medium for social cohesion across different urban environments, socio-demographic groups, and scales of interaction. Rather than presuming cohesion to be a fixed outcome or singular state, it explores how cohesion is shaped through spatial configurations, patterns of social behaviour, and individual perceptions of inclusion and belonging. The research proceeds from the assumption that cohesion is not simply built into the form of space, nor reducible to individual attitudes, but emerges through the interactions (Cattell et al., 2008b), affordances (Aelbrecht, 2016; Dempsey, 2008), and meanings (Amin, 2008) that public space enables or constrains.

1.2 Research Motivation

Public space matters for social cohesion not only because it is where people come together, but because it is where the difference is made visible, negotiated, and lived. As the material and symbolic stage for everyday life, public space has the potential to support the formation of weak ties, the recognition of others, and the development of shared belonging, conditions widely associated with cohesive societies (P. Hickman, 2013). Yet this potential is contingent and shaped by how space is designed, how it is used, and how it is perceived. Understanding public space as a catalyst for social integration requires a conceptual lens that integrates spatial form, social behavior, and subjective experience, moving beyond mere physical accessibility or policy intent.

The theme of public space and social cohesion spans multiple disciplinary terrains, urban design, environmental psychology, planning, human geography, and social policy, each offering different but interrelated insights (Aelbrecht, 2016; Qi et al.,

2024). This cross-domain positioning is analytically generative but also methodologically demanding. On the one hand, it enables a multidimensional understanding of cohesion that attends to the spatial configuration of environments, the social behaviours they facilitate, and the symbolic or emotional meanings these interactions acquire. On the other hand, it necessitates conceptual precision across scalar levels. Cohesion is often framed at the societal level, as a function of shared norms, civic trust, and institutional integration (Schiefer & van der Noll, 2017), but it also manifests itself in routine spatial practices: in who feels able to linger, who engages with whom, and how bodies coexist in shared environments (Jones et al., 2015). Public space becomes a rare empirical site where these scalar dimensions converge, where built form, interaction, and perception entangle to either support or undermine the everyday production of social cohesion.

The research challenge is twofold. Conceptually, public space and social cohesion remain fragmented domains. Urban designers, environmental psychologists, and policy scholars approach these themes through different vocabularies and assumptions, with limited integration across spatial, behavioural, and psychosocial dimensions (Qi et al., 2024). This disciplinary compartmentalisation limits theoretical synthesis and obscures the layered mechanisms through which cohesion unfolds in space. Methodologically, research often isolates either spatial form or social outcome, failing to capture the dynamic processes that mediate between them, such as how spatial affordances shape interaction patterns, or how visibility and proximity influence perceived inclusion. As a result, our understanding of public space as a relational and symbolic infrastructure for cohesion remains partial and undertheorised.

This conceptual and methodological fragmentation is further compounded by a persistent policy abstraction[1]. Cohesion is frequently invoked in urban strategies, but the term is rarely defined in operational terms. Policies tend to emphasise design quality, safety, and engagement, yet lack the frameworks to assess how spatial interventions actually support relational outcomes (Carmona, 2019b; Dempsey et al., 2011). Post-occupancy evaluations seldom address social processes or user experience, leaving a critical gap between ambition and accountability. Without concrete behavioural indicators or spatial metrics for cohesion, public space policy risks relying on rhetorical alignment rather than evidence-based practice.

In response, our research proposes an integrative framework for understanding how public space contributes to social cohesion. Rather than treating cohesion as an output of urban design (Aelbrecht et al., 2019) or a function of shared values (Jenson,

[1]Policy abstraction here refers to the tendency of public space strategies to reference cohesion-related aims in broad or rhetorical terms, without specifying the behavioural mechanisms, spatial conditions, or evaluative tools needed to translate those aims into measurable outcomes (Carmona, 2003; Orazani et al., 2023).

2010), it is approached here as a layered and relational process: co-produced by material conditions, social behaviours, and subjective experiences. This demands a multilevel conceptual lens, grounded in three intersecting orientations.

A spatial–behavioural lens, informed by the work of Whyte (1980), focuses on the observable ways in which built form and spatial layout influence social behaviour. Whyte (1980)'s studies of urban plazas and sidewalks revealed how subtle design of physical characteristics shape where and how people interact. This lens is particularly useful for understanding how spatial configurations either afford or inhibit patterns of co-presence, lingering, group formation, and interactive behaviours. In applying this lens, our research attends to how the physical attributes of public space mediate who appears, stays, or engages in social action, and how these patterns reflect broader social dynamics in urban life.

Building on this, an ecological–social lens draws on the foundational ideas of Lawton (1989) and J. Wu (1999), extending ecological theories of human-environment fit to public space. Lawton and Nahemow (1973)'s environmental press model posits that the behaviour of individuals in space is shaped by the interaction between their personal capacities and environmental demands or supports. J. Wu (1999)'s ecological hierarchy complements this by emphasising the stratified structure of spatial and social organisation within cities. Together, these theories encourage an analysis that considers how users perceive spatial affordances (e.g., openness, surveillance, accessibility) and how they adapt strategies, such as avoidance, appropriation (Amin, 2008), or performative presence, in response to the social and spatial pressures they encounter. This lens foregrounds the relational qualities of space and enabling our understanding of how inclusion, exclusion, and negotiation unfold in everyday environments.

Meanwhile, a psychosocial lens, grounded in environmental psychology and informed by scholars like Lynch (2014) and Bonnes and Secchiaroli (1995), examines how individuals cognitively and emotionally process public space. It focuses not just on what people do in space, but how they experience it: whether they feel safe, seen, welcome, or out of place. Lynch (2014)'s work on the legibility and imageability of urban environments emphasises how spatial perception contributes to a sense of orientation and meaning. Bonnes and Secchiaroli (1995)'s focus on social representations, collectively held meanings, values, and beliefs, as the mediating force between people and their environments, is particularly illuminating for understanding the dynamics of public space and social cohesion. This lens enables our research to capture affective dimensions of public space engagement, including how perceived safety, familiarity, and symbolic belonging shape social cohesion. It supports an understanding of cohesion that includes not only visible interaction, but also perceived

inclusion and emotional resonance.

These lenses directly inform the research design and analytical logic of our research. The behavioural mapping study (Chapter 6) applies a spatial–temporal stratification strategy to examine how demographic presence and interaction types vary across settings. The survey study (Chapter 7) uses moderation and mediation models to test how perceptions of space and frequency of social interaction jointly affect cohesion. The focus group analysis (Chapter 8) explores how users narrate and negotiate inclusion in their everyday spatial encounters. Prior to these empirical stages, the systematic literature review (Chapter 4) and structured policy review (Chapter 5) identify and interrogate the conceptual, empirical, and institutional gaps that frame the problem.

Taken together, these studies enable a move beyond simplified accounts of cohesion as spatial colocation or subjective goodwill. Instead, our research offers a structured and evidence-based framework for understanding how cohesion is made and unmade in the everyday flows of urban public life. It addresses not only what public space is, but what it does, and for whom, in different spatial, temporal, and social contexts.

1.3 Research Questions

The central question our research addresses is: *How do spatial, behavioural, perceptual, and experiential dimensions of public space interact to shape social cohesion across urban contexts*? This inquiry responds to persistent gaps in how cohesion is conceptualised, measured, and operationalised in relation to everyday urban environments. Public space is increasingly recognised as a socially charged setting that is capable of enabling interaction and inclusion, yet often reinforcing exclusion, inequality, and symbolic boundaries (Amin, 2008). Addressing this complexity requires an integrated analytical approach. Accordingly, the thesis is organised around four interlinked research questions:

- **RQ1:** What conceptual, empirical, and policy gaps exist in understanding how public space influences social cohesion, and how can these inform a cross-method empirical agenda?
- **RQ2:** How do spatial, temporal, demographic, and relational conditions structure patterns of social behaviour and group presence in public space?
- **RQ3:** How do public space characteristics, individual perceptions, and social interaction frequency interact to shape social cohesion?
- **RQ4:** How do individuals experience, and negotiate social interaction and

cohesion in public spaces?

1.4 Research Aim and Objectives

This research aims to build a holistic understanding of how public space contributes to the production of social cohesion in cities. Rather than isolating spatial, behavioural, perceptual, or experiential factors, the study investigates how these dimensions interact and co-evolve across different urban contexts to shape socially cohesive environments. The key objectives of our research are:

- To synthesise current research and policy framings of public space and social cohesion, identifying conceptual gaps and normative assumptions;
- To analyse public space use through a spatio-temporally stratified behavioural mapping design, capturing variation in activity, interaction, and group presence;
- To test how user demographics, perceptions of space, and frequency of social interaction jointly affect social cohesion through moderation and mediation models across urban environment types;
- To explore how individuals interpret and navigate public space in relation to identity, inclusion, and patterns of social presence.
- To develop an integrated understanding of how social cohesion is produced in urban public space by synthesising insights from policy, literature, observed behaviours, user perceptions, and lived experiences.

1.5 Research Contributions

This thesis responds to three persistent challenges in the study of public space and social cohesion: (1) conceptual fragmentation across disciplinary boundaries; (2) a limited methodological repertoire for analysing spatially embedded social behaviour; and (3) the tendency of policy frameworks to articulate cohesion in abstract terms, detached from the everyday dynamics they seek to influence.

The contributions are structured as agenda-setting commitments that guide the empirical and analytical work of the thesis:

- **Conceptual integration:** Advance a cross-disciplinary synthesis of spatial, behavioural, and psychosocial approaches to public space and cohesion. This includes consolidating insights from urban design, environmental psychology,

and social theory to expose the lack of shared frameworks, consistent typologies, and evaluative comparability.

- **Policy problem-structuring:** Apply a structured policy review to critically assess how UK national and local frameworks conceptualise public space and cohesion. This addresses the persistent absence of post-occupancy evaluation for social outcomes, showing how cohesion is framed through design, safety, and participation lenses while relational mechanisms remain under-specified.
- **Ecological observation design:** Develop a spatially and temporally stratified behavioural mapping strategy that enables ecological analysis of group presence and social behaviour across distinct urban settings. This responds to limitations in conventional observational studies that overlook demographic visibility, interaction types, and temporal rhythms.
- **Framework development:** Build a social–ecological interpretive framework for analysing how spatial conditions structure behavioural patterns and relational presence. Drawing on Lawton's environmental press model and Wu's ecological hierarchy, this framework integrates configuration, visibility, and demographic presence, providing a scalable alternative to static or perception-based metrics.
- **Analytical innovation:** Employ moderation and mediation modelling to test how perceptions, interaction frequency, and demographic characteristics jointly shape cohesion outcomes. By differentiating residential neighbourhoods and city centres, the analysis aims to reveal how psychosocial pathways vary across spatial contexts and generate new insights into the links between form, behaviour, and inclusion.

These contributions are presented here as an agenda to be delivered and evidenced across the empirical chapters that follow. Their fulfilment is assessed in the conclusion (Chapter 10), where the thesis reflects critically on the conceptual, methodological, and empirical advances achieved.

1.6 Thesis Outline

The remainder of this thesis is organised as follow:

Chapter 2 establishes the conceptual and empirical foundations of the thesis. It consolidates key definitions, dimensions, and analytical frameworks, tracing how core constructs are understood and operationalised across academic research and applied policy domains. In doing so, it identifies critical conceptual and methodological gaps

that inform the thesis design.

Chapter 3 outlines the multi-stage mixed-methods approach. It explains the rationale, sequencing, and integration of the five components, including literature and policy reviews, behavioural mapping, survey, and focus groups.

Chapter 4 presents findings from the systematic literature review (SLR), identifying dominant framings, thematic clusters, and methodological limitations. It defines the empirical and theoretical gap the thesis addresses (Qi et al., 2024).

Chapter 5 reports the structured policy review (SPR) of UK policy on public space and social cohesion. It analyses how public space is framed through design, safety, and participation while lacking post-occupancy evaluation of social outcomes and standardised social cohesion measures, exposing gaps between policy discourse and practice.

Chapter 6 presents the behavioural mapping study. It analyses demographic presence, activity types, and interaction patterns across spatial and temporal contexts, offering insight into the behavioural ecology[2] of public space.

Chapter 7 reports the survey study, testing moderation and mediation models linking public space characteristics, user demographics, individual perception, social interaction frequency, and cohesion. It compares pathways across residential neighbrouhood and city-centre settings.

Chapter 8 presents qualitative insights from a focus group study. It explores experiences of inclusion, visibility, and relational navigation in public space, with attention to identity and spatial strategy.

Chapter 9 synthesises findings across the empirical components. It discusses how spatial, behavioural, and perceptual dynamics interact across methods and contexts. The chapter reflects on the coherence and scope of the evidence base, further identifies key theoretical and policy implications.

Chapter 10 concludes the thesis by revisiting the research questions. It discusses the thesis's contribution to knowledge and draws upon the researcher's reflection. The chapter further reflects on the methodological limitations and directions for future inquiry for advancing inclusive and relational approaches to public space and social cohesion research and policy development.

[2]The term "behavioural ecology" refers here to the structured relationship between user presence, social interaction, and spatial–temporal conditions in public space. It draws on ecological frameworks in environmental psychology (e.g., Lawton (1989) and J. Wu (1999)) that emphasise person–environment fit, interaction frequency, and behavioural affordances.

Chapter 2

Foundations and Gaps in Literature and Policy

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2.1 Introduction

Understanding how public space contributes to social cohesion requires conceptual tools that can navigate the intersection of spatial form, social behaviour, and psychosocial meaning. While existing research has explored physical design, interactional norms, and individual perception, few attempts have been made to systematically integrate these into a coherent analytical lens (Qi et al., 2024). Moreover, current UK policy frameworks tend to emphasise participation and design quality, while under-specifying the everyday behavioural and psychosocial processes through which cohesion is experienced, produced, or hindered.

This chapter responds to these gaps by establishing the theoretical and conceptual foundations of the thesis. Recent research and policy discourse on public space and social cohesion remain marked by thematic fragmentation and disciplinary silos (Aelbrecht, 2016; X. Guo et al., 2022). While physical design, participatory mechanisms, and spatial planning receive substantial attention, the behavioural, perceptual, and relational processes through which cohesion is produced are often under-theorised or treated in isolation. This chapter addresses that gap by critically synthesising conceptual insights across urban design, environmental psychology, and social theory to establish a coherent analytical foundation for this thesis. It provides a cross-cutting framework for understanding how public space shapes cohesion as a multi-level, emergent process.

This chapter sets the stage for the thesis by providing a high-level literature review that clarifies, synthesises, and aligns key constructs, conceptual frameworks, and problem domains across disciplinary boundaries. While later chapters offer more granular systematic and policy reviews, this chapter takes a broader view, engaging critically with how public space and social cohesion have been defined, operationalised, and debated within the academic and policy spheres. It brings together insights from urban design, planning, environmental psychology, sociology, and governance studies to illuminate underlying assumptions, points of contention, and conceptual overlaps. In doing so, it creates a shared analytical vocabulary and conceptual grounding that supports the analytical coherence of the thesis. By attending to both theoretical and policy debates, the chapter highlights the need for a more integrated lens, one capable of addressing the behavioural, perceptual, and structural dimensions that shape public life.

This chapter proceeds as follows:

- Section 2.2reviews background literature on public space and social cohesion, including key definitions, conceptual dimensions, and findings from previous systematic reviews. It establishes the scope and significance of both fields and

clarifies how core constructs are framed and applied throughout the thesis.

- Section 2.3 synthesises key research frameworks of prior academic work to incorporate empirical and theoretical contributions across urban design, behavioural interaction, and social outcome literatures. This establishes a broader interdisciplinary foundation for the thesis.
- Section 2.4 maps the UK policy environment and its problem structure, showing how current approaches to cohesion, inclusion, and space use remain underspecified in terms of behavioural and perceptual mechanisms.
- Section 2.5 highlights conceptual and operational disconnections across governance, design guidance, and lived experience. It synthesises cross-disciplinary gaps to motivate the need for an integrative conceptual approach.
- Section 2.6 concludes the chapter and transitions to the methodological framework presented in Chapter 3, establishing a clear link between conceptual framing and empirical strategy.

2.2 Background and Related Work

"Social cohesion", or "Interdependence" between members of society, shared loyalties and solidarity", as defined by Durkheim (1893), has been considered as a desirable feature of a well-functioning society and often adopted as an instrument to address the social, physical, and economic challenges our contemporary cities face (Murphy, 2012). It is identified as the key construct that characterises the social environment in terms of interpersonal dynamics and/ or collective efforts, which often relate to positive social interactions (Jennings & Bamkole, 2019). Research has substantiated the positive role of social cohesion on preserving strong and functional communities (Kearns & Forrest, 2000), promoting human health and wellbeing (Dash & Thilagam, 2022), the maintenance of a high quality of life (Paranagamage et al., 2010), and managing urban population growth and sustainability (Lloyd et al., 2016). This context observed an increasing effort from the national governments in many countries to foster social cohesion, either through turning it into a policy priority (e.g., the EU Cohesion Policy (2021–2027)) or through developing public realm programmes (Commission, 2022; UNDP, 2022; UN-Habitat, 2018). There is a shared consensus that social cohesion can be promoted through urban design and planning mechanisms, e.g., new urbanism led neighbourhood design (J. Kim & Kaplan, 2004), public space design for contemporary urban life, and Jacobs' theory on vibrant city and social interaction (S. C. Brown & Lombard, 2014). The importance of urban public space in facilitating social cohesion has become even more

evident since we continue to advance our understanding of the interplay between the physical and social factors in how they affect social cohesion (Lofland, 1998). Public space serves as opportunities for everyday engagement including cultural activities and social interactions (Carmona, 2019a). For example, neighbourhood commercial streets work as the venues for social interactions among residents and community engagement introduces a "feel-good" buzz and increases social capital in terms of improving urban vitality (Lotfata & Ataöv, 2020; Modie-Moroka et al., 2020). The in-between space adjacents to buildings and streets represents the important urban morphologies which affect social interactions occurring in different urban niches (Aelbrecht, 2016). The implication of physical co-presence and conviviality plays a fundamental role in increasing social capital and building community (Zordan et al., 2019). Meanwhile, the presence of public open spaces in the residential setting influences people's perceptions of the neighbourhood which in turn nurtures place attachment and their sense of community (Soares et al., 2020; Zhu, 2015).

Public space and social cohesion are deeply intertwined concerns in urban research, yet they are rarely treated within an integrated analytical frame. Research on public space has traditionally focused on spatial form, physical access, and design affordances (Ganji & Rishbeth, 2020; Lara-Hernandez et al., 2019; Zordan et al., 2019). Social cohesion, on the other hand, is often approached through sociological perspectives that foreground belonging, trust, and inclusion (Cattell et al., 2008b; Kearns & Forrest, 2000). These disciplinary paths have produced valuable insights, but the connections between spatial environments and the processes that generate collective social outcomes remain loosely defined.

This thesis takes the position that public space is an active site of interaction, perception, and meaning-making (Lawton & Nahemow, 1973). Social cohesion is understood here as an emergent quality shaped by encounters in space, perceived inclusion, and negotiated social norms (Khalilin & Fallah, 2018; Schiefer & van der Noll, 2017; Schmidt & Németh, 2010). Studying the relationship between the two requires conceptual tools capable of engaging with form, behaviour, and experience at multiple levels.

Across urban studies, planning, environmental psychology, and political theory, both constructs have been widely studied, but often through distinct methodological and epistemological lenses. Urban design literature highlights the role of spatial layout, permeability, and mixed use (Can & Heath, 2015; Cao & Kang, 2019). Psychological studies attend to comfort, territoriality, or emotional attachment (Levasseur et al., 2011; Peng et al., 2019; Wickes et al., 2019). Policy-oriented work prioritises civic participation, community resilience, and integration indicators (Bartram, 2019; Kalra & Kapoor, 2009b; Mattei & Broeks, 2018). Yet, despite these contributions,

there remains a limited understanding of how public space operates as a mechanism through which cohesion is structured and expressed in everyday life (Qi et al., 2024).

By defining key concepts and clarifying the significance of treating public space and social cohesion as co-produced phenomena, the goal is to move beyond fixed typologies or normative expectations of what public space"should" offer, and instead examine how spatial conditions, behavioural patterns, and perceptual cues interact to shape the presence, visibility, and inclusion of diverse social groups. By situating the study at the intersection of multiple disciplinary and policy conversations, it establishes the foundation for a broader conceptual lens that guides the remainder of the chapter.

2.2.1 Defining Public Space

Most writers on public space choose to focus on what they view as the practice and theory of public space in what they see as the social function of public space, as Carmona (2010a) notes: *"Urban public space shapes and is shaped by society"*. In the literature, there have been various definitions of public space in relation to ownership, management, and functionality (Mehta, 2014). Table 2.1 serves to demonstrate the wide range of views around how public space has been discussed.

Reference	**Definition of Public Space**	**Emphasis (interpreted from paper)**
Mitchell & Staeheli (2009)	Public space is property open to public use. It can be privately or publicly owned.	Ownership
Carr, Francis, Rivlin, & Stone (1993)	Public spaces are open, publicly accessible places where people go for group or individual activities.	Functionality
Madanipour (1996)	Space that allows all people to access it and its activities, controlled by a public agency, provided and managed in the public interest.	Functionality, ownership, management
Low & Smith (2006)	Public space is differentiated from private space by rules of access, control over entry, permitted behaviours, and use.	Management, ownership
Miller (2007)	Public spaces are imagined as publicly owned, open to everyone, and central to democratic life — spaces for civic events, protest, and visibility.	Ownership, functionality
Parkinson (2013)	Spaces can have some, all, or just one feature we label as 'public', and still be considered public space.	Functionality
UN-Habitat (2018)	All places publicly owned or of public use, accessible and enjoyable by all for free and without profit motive.	Ownership

Table 2.1: Definitions and Interpretations of Public Space

Many of the urban design scholars define public space by drawing upon the theory of place in which it is considered as the behaviour settings for everyday human activities (Del Aguila et al., 2019; Ghahramanpouri et al., 2015).Others consider public space as the focal points of public realm with different degrees of spatial control (Salaza & Wilxoc, 2013). It is also suggested that the provisions of access to and use of public spaces have traditionally defined public space as places for social gathering (Carr, 1992; Dines et al., 2006a). Drawing upon these varied definitions, public space is, therefore, understood to be the shared common ground of democracy and the spatial setting of the public sphere that allows for casual exchange and encounters among different race, ethnicity, and between locals and strangers (Madanipour, 1996).

2.2.2 Emerging typologies in public places

The changing needs and demands of urban dwellers result in the emerging typologies of public spaces reflecting the contemporary public social life(Oldenberg, 1989). Oldenberg (1989) coined the term "third places" to represent a generic destination that is outside of home and work where people go for individual and collective public social activities. The increasing social role of"third places" has led an increasing interest in researching semi-public space / quasi-public space where private spaces that are conditionally made available to the public including commercial services and local facilities such as cafes, pubs, community centre, etc. (Boessen et al., 2018; P. Hickman, 2013; Pratt, 2010). "Third place" also can be found in the listed public space typologies suggested by the Charter of Public Space and the UN-habitat, namely, public facilities and public commercial spaces (UN-Habitat, 2015). Another prominent emerging typology of public spaces is the "fourth place" which identifies informal public spaces that are characterized with "in-betweennes" and conducive for diverse opportunities of social interactions Aelbrecht (2016). Despite Aelbrecht (2016) providing a normative view on the contemporary public settings for informal social interactions, other researchers explored this typology of public spaces using different terminologies such as "in-between space" (Can & Heath, 2015), "transition space" (Pittaluga, 2020). Their complexity of territory can be seen from informal public settings including buffer zone, soft edges, etc. More importantly, the spontaneous and temporary appropriation of the in-between spaces plays an important role to construct urbanity as well as to promote sense of belonging and social cohesion (Hajer & Reijndorp, 2001; Lara-Hernandez et al., 2019).

2.2.3 Understanding Social Cohesion

Social cohesion is seen as a desirable feature of a social entity but also faces the risk of deteriorating with societies worldwide undergoing rapid social and economic

changes, i.e., economic disparities, social polarisation, etc. (Chan et al., 2006; Schiefer & van der Noll, 2017). There is a shared consensus among the scholars of social cohesion regarding the lack of clear and consistent conceptualization of social cohesion (Schiefer & van der Noll, 2017). However, Schiefer and van der Noll (2017) provided a comprehensive review on the essentials of social cohesion by defining social cohesion with social relations, identification with the geographical unit, and orientation towards common good.

The meaning of social cohesion varies according to its context (Forrest & Kearns, 2001). It has been suggested there are a variety of domains and variants of social cohesion in terms of how it is experienced individually and collectively in public space. This can be seen from recent attempts to characterise the impact of public space on social cohesion in the existing body of literature (Liu et al., 2020; Priest et al., 2014). For example, for the residents of a multi-ethnic neighbourhood, local public spaces such as the shops, community centres help them build social relations and enhance their sense of community (Cattell et al., 2008b). In a city with ethnically diverse population, the social encounters occurred in the public spaces located in city centre (especially in"fourth place" such as threshold spaces) facilitate social integration and community cohesion (Ganji & Rishbeth, 2020). In the context of urban street located in town centre, the historical continuity of socio-spatial activities strengthens the sense of belonging experienced by its visitors and local communities (Lotfata & Ataöv, 2020). To the minority women user group, a public space that is attentive to women's convenience (including social needs, security requirements, cultural referneces) is crucial in constructing a sense of place and building social relations (Khalilin & Fallah, 2018; A. Ortiz et al., 2004).

The varieties of ways social cohesion can be experienced among different user groups in various public spaces make it challenging to evaluate the behavioural outcomes and/or perceptual outcomes for public spaces to facilitate social cohesion. It calls for further empirical research into understanding the opportunities and constraints which reflect the motives and attitudes underlying people's social interactions in public space, i.e., matching public space provisions to social needs (based on sociodemographic charactersitics), percieved safety issues, racial and gender based restrictions (Piekut & Valentine, 2017; Talen, 2000).

2.2.4 Previous Systematic Reviews

Despite the heightened interests in the role of public space in achieving social cohesion, it is claimed that the empirical evidence is still lacking due to the divergent foci among the social scientists, geographers, as well as urban designer theorists and practitioners (Aelbrecht, 2016). This research aims to systematically synthesise the

existing literature in terms of offering a holistic understanding on the relationship between public space and social cohesion. In addition, we acknowledge three previous systematic reviews have been conducted but highlight the limitations of these studies. Table 2.2 provides a summary of the previous SLRs, and their research limitations.

Study	**Research Aim**	**Publication Years**	**No. of Studies**	**Key Limitations**
Dash & Thilagam (2022)	Identify influential characteristics of open spaces enhancing elderly well-being and social cohesion.	2011–2021	57	Emphasis on physical over social attributes; limited to open spaces and elderly users.
Wan, Shen, & Choi (2021)	Explore how urban green space aspects influence social cohesion and uncover mediating pathways.	1997–2018	51	Does not account for demographic moderators or social interaction mediators; limited to green spaces.
Mazumdar et al. (2018)	Examine built environment factors shaping social capital across scales.	2003–2015	23	Lacks interactional analysis; omits mechanisms linking people and space; spans various built spaces.

Table 2.2: Comparison of systematic reviews on public space and social cohesion

Reflecting the complex relationship between public space and social cohesion, previous SLRs point to a homogenization in the classification of public space (Carmona, 2010a), to the diversed conceptualizations of social cohesion (Schiefer & van der Noll, 2017), and to a positive stance towards the connection between social interaction and the spatial / physical characteristics of the public space (Aelbrecht, 2016). It is also true to say that much of the literature comes from a narrow academic perspective, and focus on certain types of public space, while not necessarily recognizing the the sheer diversity of contemporary urban public life (Aelbrecht et al., 2021; Dines et al., 2006a) that consitutes the embodied and relational experiences of social cohesion that it fosters. Therefore, these reviews often stop short of organising key constructs into coherent dimensions that support analytical clarity and operational consistency.

2.2.5 Dimensions of public space and social cohesion

Drawing on interdisciplinary literature from planning, environmental psychology, and urban sociology, this research defines the normative, functional, and relational dimensions of public space, alongside the perceptual, interactional, and group-based dimensions of social cohesion. These categories underpin the analytical lens adopted throughout this thesis.

Public space is understood through three interrelated dimensions:

- The **normative dimension** encompasses formal policy aspirations and de-

sign ideals that position public space as accessible, inclusive, and a facilitator of social integration. These ideals reflect how public space is framed within planning and governance discourses (Carmona, 2014), emphasising principles such as openness, safety, and participation.

- The **functional dimension** addresses empirically observable patterns of use, focusing on how different groups occupy, move through, and engage with public spaces. It highlights measurable behaviours, activities, and temporal rhythms (H. Nguyen, 2019)that structure social life within the built environment.
- The **relational dimension** foregrounds public space as socially produced through dynamic interactions (Aelbrecht, 2016; Madanipour, 2019; Mateo-Babiano, 2012). This perspective prioritises the negotiation of identity, belonging, and visibility, recognizing that social relations and power dynamics shape who is present, how they interact, and the meanings they ascribe to place.

Public space has traditionally been treated as a physical arena for collective life, a visible manifestation of democratic ideals and social possibility (Carmona, 2010b; Madanipour, 2003). Normative discourses emphasise its role in fostering openness, accessibility, and belonging (Carmona, 2014; Carr, 1992). Policy guidance, such as the *UK National Design Guide* and the *UN-Habitat's Global Public Space Toolkit*, reinforces this perspective, embedding aspirations of safety, inclusivity, and adaptability into governance frameworks (UN-Habitat, 2015).

However, normative framings often abstract public space from its lived and contested realities. Functional approaches reintroduce the empirical—foregrounding observable behaviours, temporal patterns, and spatial affordances. Studies in environmental psychology and urban design have shown how features such as seating, visibility, and mixed use promote co-presence and activity diversity (Francis et al., 2012; Gehl, 2011; Mehta & Bosson, 2021). These analyses provide measurable links between design and behaviour, but often lack attention to who is included, how meaning is made, or why exclusion persists.

Relational perspectives address this blind spot by reframing public space as socially produced, constructed through ongoing negotiation, power dynamics, and collective memory (Aelbrecht, 2016; S. M. Low, 2000; Madanipour, 2019). Here, public space is not a passive container but an active medium through which belonging is performed and contested. Research on "third" and "fourth places" (e.g., cafés, plazas, in-between spaces) further complicates binary distinctions between public and private, revealing how thresholds and soft edges serve as liminal zones of social interaction and identity formation (Aelbrecht, 2016; Oldenberg, 2007; Pittaluga,

2020).

Together, these approaches offer complementary lenses, yet remain insufficiently integrated. Normative ideals rarely interrogate functional patterns of use; functional studies often overlook the symbolic or affective; and relational accounts tend to lack systematic operationalisation. This thesis addresses these tensions through a multidimensional definition that explicitly aligns public space's normative, functional, and relational dimensions with analytical constructs and empirical measures.

Similarly, social cohesion is conceptualised across three complementary domains[1] to capture its complex, multi-layered nature as an evolving outcome grounded in both social interaction and structural inclusion(Ager & Strang, 2008).:

- The **perceptual domain** includes individuals' subjective experiences and feelings of safety, belonging, and acceptance within public space (Dempsey, 2008). It encompasses affective and symbolic dimensions that influence whether users perceive a space as welcoming or exclusionary.
- The **interactional domain** focuses on the frequency, quality, and types of social encounters occurring in shared spaces (Mehta, 2019a; Wickes et al., 2019). It captures how interactions, for example, fleeting, enduring, or passive, contribute to the social fabric and collective life of public environments.
- The **group-based domain** considers the demographic and social composition of space users (Amin, 2008; Kalra & Kapoor, 2009a), reflecting structural patterns of inclusion, segregation, or exclusion along lines of ethnicity, age, gender, or socioeconomic status.

Social cohesion is widely regarded as a critical feature of resilient, equitable, and inclusive societies. Yet, as numerous reviews note, it remains a contested and inconsistently applied concept (Chan et al., 2006; Schiefer & van der Noll, 2017). From a planning and social policy perspective, cohesion is often framed as a target condition, manifested in shared values, active participation, and reduced segregation. In contrast, psychological and sociological perspectives emphasise its fluidity, contingency, and grounding in micro-level interactions and macro-level structures (Forrest & Kearns, 2001; Kalra & Kapoor, 2009a).

Perceptual dimensions of cohesion foreground individual experiences of safety, belonging, and affective attachment to place (Dempsey, 2008; Leyland & Groenewegen,

[1]This approach aligns with contemporary scholarship that moves beyond framing cohesion as either a static condition or an attitudinal disposition. Instead, it is treated as a dynamic process. Social cohesion is characterised by temporal fluidity, contextual responsiveness, relational adaptation, shaped by institutional decisions, and subject to ongoing negotiation and contestation(Forrest & Kearns, 2001; Kalra & Kapoor, 2009a; Schiefer & van der Noll, 2017).

2020). These dimensions are especially salient in diverse or transitional urban environments, where spatial cues and social signals mediate inclusion or exclusion. Public space becomes a site of perceptual negotiation, shaped by familiarity, comfort, and symbolic resonance (Francis et al., 2012; Ganji & Rishbeth, 2020).

Interactional accounts shift focus to the micro-dynamics of encounter: the frequency, duration, and quality of social exchanges. Urban sociologists such as Amin (2008) and M. Harris and Young (2009) argue that everyday contact, whether fleeting, enduring, or ambient, contributes to tolerance and social learning. However, this contribution is neither automatic nor uniformly distributed. Several studies show that the affordance of interaction depends on spatial layout, time of day, and the perceived openness of a setting (Mehta, 2019a; Wickes et al., 2019).

The group-based domain introduces demographic complexity. Social cohesion is not merely a product of interaction but is structured by who interacts with whom, under what conditions, and in which spatial arrangements. Gendered, racialised, and classed experiences of space condition the possibilities for belonging and visibility (Lara-Hernandez et al., 2019; A. Ortiz et al., 2004; Piekut & Valentine, 2017). Yet, many studies in planning and urban design fail to disaggregate findings by user group or to examine how intersecting identities shape cohesion outcomes.

2.3 Theoretical and Empirical Foundations

The preceding discussion has outlined the multiple dimensions through which public space and social cohesion are understood, spanning normative, functional, relational, perceptual, interactional, and structural domains. These conceptualisations are grounded in diverse and evolving strands of literature across urban design, planning, environmental psychology, and sociology. Although each field has offered valuable theoretical and empirical insights, much of this work has developed in relative disciplinary isolation (Aelbrecht, 2016; Qiu et al., 2025). As a result, existing studies often privilege either spatial form, behavioural pattern, or psychosocial meaning, without fully addressing how these dimensions interact to shape social outcomes.

To move beyond this conceptual fragmentation, the following section reviews and synthesises three interrelated theoretical perspectives that offer integrative potential, including spatial–behavioural, social–ecological, and psychosocial frameworks. Each of these literatures brings a distinct analytical lens to understanding how public space can support or constrain processes of cohesion, whether through affordances for co-presence and interaction, adaptive responses to environmental and institutional conditions, or the symbolic and emotional meanings ascribed to place. This synthesis does not propose a new theoretical model, but instead draws on existing academic

work to construct a cross-disciplinary scaffolding that can support more coherent analytical engagement throughout the thesis. By reviewing these frameworks side by side, this section helps clarify the conceptual terrain and supports a more holistic engagement with the mechanisms through which space and society co-produce social cohesion.

2.3.1 The Spatial–Behavioural Framework

The spatial–behavioural tradition conceptualises public space as a performative medium, an active terrain of encounter shaped by both material affordances and socio-spatial rhythms. Rooted in ecological perception theory (Gibson, 1977), this perspective foregrounds the role of physical form in shaping patterns of movement, visibility, co-presence, and social exchange. Public space, in this reading, is more than a passive backdrop to activity, regarded as a co-producer of behaviour, its spatial structure subtly scripts how individuals and groups inhabit, traverse, linger, or withdraw from urban life.

This framework gained empirical traction through the foundational observational studies of Whyte (1980) and Gehl (2011), who demonstrated that seemingly minor design choices, such as bench placement, edge permeability, and sightlines, profoundly affect the frequency, duration, and diversity of social interactions. Whyte (1980)'s time-lapse studies of Manhattan plazas revealed how thresholds, visual access, and clustering dynamics created fertile ground for spontaneous sociability. Ghel (1973)'s systematic mapping of urban life illustrated how façade rhythm, soft edges, and enclosure conditions generated layered patterns of occupancy and relational use. These insights reframed urban design not as form-making but as behaviour-shaping, aligning with Gibson (1977)'s theory of affordances in arguing that environments invite certain actions depending on users' capabilities and intentions.

Subsequent research has expanded this framework into diverse methodological directions. Behavioural mapping (Aelbrecht, 2016), spatial syntax (Hannson & Hillier, 1987), and proxemic analysis (Mehta, 2009) offer tools to examine how spatial configuration mediates social density, encounter probability, and temporal rhythms of use. Studies increasingly adopt spatial and temporal analytics, including time-stamped observational data, agent-based simulations, and computer vision techniques, to connect environmental features with empirical patterns of interaction (X. Guo et al., 2022; T. V. Nguyen et al., 2019; Noyman & Larson, 2020; Scheutz & Mayer, 2016; Sila-Nowicka, Paule, et al., 2016). These approaches enable planners and designers to evaluate not only when people go, how often, and where, enriching the empirical foundation for inclusive and socially productive design.

Central to this perspective is the idea that the spatial–behavioural lens seeks to reveal the latent infrastructure of sociability, the spatial configurations that enable or inhibit everyday encounters. Aelbrecht (2016) emphasises how transitional zones, spatial diversity, and natural surveillance foster "interactional layering", allowing different social groups to share space without conflict. Mehta (2009) distinguishes between sociofugal and sociopetal designs, spaces that discourage or facilitate interaction in terms of highlighting how seemingly neutral urban features encode relational intent. Montgomery (1998) similarly links urban vitality to the overlap of functional variety, sensory stimuli, and spatial comfort, establishing a framework for evaluating the social performance of space.

In relation to social cohesion, the spatial–behavioural framework offers a foundational lens for understanding how the physical configuration of space structures the potential for social interaction. This perspective foregrounds how spatial form shapes behavioural affordances, enabling, directing, or constraining patterns of use and co-presence. Seminal contributions from environmental psychology and urban design have long observed that visibility, accessibility, permeability, and enclosure play critical roles in shaping social behaviour in public settings (Can & Heath, 2016; Cao & Kang, 2019; Ganji & Rishbeth, 2020). Design elements such as seating, edge conditions, walking paths, and thresholds are not merely aesthetic; they function as cues and supports for informal sociability, negotiation of personal space, and collective activity (Aelbrecht, 2016; Aelbrecht et al., 2021).

The spatial–behavioural literature also provides diagnostic clarity on the environmental preconditions for sociality, such as safety, legibility, and comfort. These attributes do not simply influence whether people use space, but how they inhabit it, whether they linger, observe, initiate contact, or retreat. For example, Mehta (2014) argues that the presence of multiple micro-settings within a single public space (e.g., shaded areas, open lawns, narrow paths) supports different forms of social interaction, from passive co-presence to sustained engagement. Similarly, observational studies have shown how urban morphologies facilitate or hinder opportunities for intergroup encounters, with compact, fine-grained, and multifunctional environments typically supporting higher levels of spontaneous sociability (Madanipour, 1996, 2006). By embedding the analysis of cohesion in observable spatial behaviour and physical affordances, this framework provides a grounded empirical pathway for evaluating how design interventions shape inclusive participation in public life.

2.3.2 The Social–Ecological Framework

While the spatial–behavioural framework offers a grounded perspective on how the design of public space shapes patterns of presence, encounter, and co-presence (Gehl, 2011; Whyte, 1980), it tends to focus on immediate and observable interactions within the built environment. In contrast, the social–ecological framework expands the analytical horizon to consider how these spatial behaviours are embedded within nested social, institutional, and ecological contexts (Bronfenbrenner, 1980; J. Wu, 1999). Drawing on traditions from urban ecology, systems theory, and environmental psychology, this framework positions public space as a relational node within broader urban systems, shaped by governance structures, infrastructure networks, social capital, and environmental change (Frumkin et al., 2004; X. Guo et al., 2022; Leyland & Groenewegen, 2020). It offers a multilevel lens to trace how individual and collective outcomes, such as inclusion, wellbeing, and cohesion, emerge from the interplay between spatial form, population characteristics, and institutional arrangements. This systems orientation enables researchers to understand how public space functions across scales, and how patterns of access, exclusion, and interaction are shaped by wider ecological, demographic, and policy environments.

The social–ecological framework offers a systems-oriented perspective that conceptualises public space as embedded within nested social, institutional, ecological, and spatial environments. It draws on ecological systems theory (Bronfenbrenner, 1980), which posits that individual development is shaped by interactions across multiple levels of context, from immediate settings (microsystems (Aelbrecht, 2016; Can & Heath, 2016; Cao & Kang, 2019; Ganji & Rishbeth, 2020)) to broader structural and cultural environments (macrosystems (Amin, 2002; Modie-Moroka et al., 2020; Wise, 2011)) . This multilayered logic has been extended into urban research through the work of scholars such as J. Wu (1999) and Lawton (1989), whose hierarchical models frame urban landscapes as interconnected systems that operate across spatial scales, from the local to the regional. Public space, in this view, is not a discrete domain but part of a dynamic socio-ecological system in which spatial form, population characteristics, institutional processes, and temporal rhythms continuously interact.

This framework challenges reductionist views of space as a fixed container and instead emphasises the relational, adaptive, and feedback-oriented nature of socio-spatial processes. For example, J. Wu (1999)'s work on hierarchical patch dynamics and landscape mosaics conceptualises cities as layered ecological assemblages whose elements (e.g., parks, streets, housing, infrastructure) interact within and across spatial-temporal boundaries. Similarly, Lawton and Nahemow (1973)'s environmental press model reflects how individual functioning in public space is shaped by the

interaction between personal competence and environmental demands, linking accessibility, usability, and participation. These theoretical traditions illuminate how public space functions as an interface between individuals and institutions, physical affordances and social norms, and micro-level behaviours and macro-level urban systems.

The social–ecological framework has been widely adopted in fields such as public health, urban planning, and environmental psychology to investigate how built environments mediate health, wellbeing, and civic life. It provides a powerful lens to study how spatial configurations interact with demographic, cultural, and policy variables to influence social cohesion, particularly in diverse or stratified urban contexts (Frumkin et al., 2004; X. Guo et al., 2022; Leyland & Groenewegen, 2020). Public space is thereby situated within an extended ecosystem that includes housing systems, mobility infrastructures, service access, local governance structures, and networks of social capital, all of which shape how space is perceived, accessed, and utilised.

Empirical applications often adopt multilevel modelling, GIS-based accessibility analysis, and systems mapping to examine relationships between environmental factors (e.g., green space coverage, street connectivity, walkability, land use diversity) (Biggs et al., 2021; De Vos et al., 2019) and cohesion-related outcomes such as trust, collective efficacy, safety, inclusion, and sense of community (Frumkin et al., 2004; Wickes et al., 2019). These studies highlight both linear relationships and non-linear interactions and thresholds, for instance, how the benefits of green space on cohesion are mediated by quality, proximity, and perceived control.

Beyond its empirical applications, the social–ecological framework contributes significant conceptual value by offering a vocabulary of interdependence, complexity, and adaptation. It enables scholars to analyse how public space outcomes are shaped through the interaction of multiple embedded systems, including spatial design, demographic composition, governance structures, infrastructure provision, and ecological change (McLeroy et al., 1988; Stokols et al., 1996). In this view, public space becomes a dynamic node in a wider socio-ecological matrix, where relationships between individuals, environments, and institutions are continually produced, reproduced, and contested.

This systems thinking allows researchers and practitioners to move beyond linear cause–effect models and toward a more relational ontology of urban processes. As argued by Sallis et al. (2015) and J. Wu (2013), urban spaces must be understood as open, adaptive systems characterised by feedback loops, path dependencies, and cross-scalar interactions. Within this framework, public space is seen more than

the social plus ecological systems, but cohesive, integrated systems characterised by strong connections and feedbacks within and between social and ecological components that determine their overall dynamics. In other words, public space should be seen as more than a site of physical activity or social interaction but a carrier of social infrastructure (S. M. Low, 2000), capable of either amplifying or dampening processes of inclusion, resilience, and civic cohesion.

Moreover, the interconnectedness of design, governance, and socio-demographic patterns becomes central to understanding inclusion and exclusion in urban environments. Scholars such as Lindgren (2010) and Purcell (2002) have shown that the formal qualities of public space, who designs it, who maintains it, and under what regulatory logic, are deeply entangled with questions of justice, access, and recognition. Similarly, Carmona (2010a) and Madanipour (2006) argue that governance frameworks strongly shape spatial outcomes, from the distribution of amenities to the presence of enforcement regimes and behavioural expectations. The social–ecological model provides the conceptual scaffolding to integrate these multi-level dynamics, supporting analysis that is both theoretically rich and policy relevant.

Person–Environment Fit within the Social–Ecological Framework

A central tenet of the social–ecological framework is that the relationship between individuals and their environment is contingent on the degree of fit between personal needs, capacities, and the affordances of the surrounding environment. The concept of Person–Environment Fit (P–E Fit), initially developed in environmental psychology and gerontology (Gifford, 2014; Lawton, 1990), posits that individual wellbeing and functioning are shaped by the alignment between personal competencies and environmental demands or supports. When the environment affords opportunities congruent with individual preferences, capabilities, and identity, positive psychosocial outcomes, including belonging, participation, and wellbeing, are more likely to emerge. Conversely, misalignment may generate exclusion, withdrawal, or spatial avoidance.

Within urban public space scholarship, P–E Fit offers a powerful explanatory lens for understanding patterns of spatial engagement and social cohesion. Lawton and Nahemow (1973)'s ecological model of ageing, for example, illustrates how functional limitations interact with environmental press to produce different behavioural and affective outcomes. Although originally focused on ageing populations, the model has since been extended to diverse urban populations, including children (Gifford, 2007), migrants (Qiu et al., 2025), and marginalised communities (Akesson et al., 2017), making it applicable to broader inquiries into equity and access in public settings.

Empirical studies using the P–E Fit framework in urban contexts often examine how spatial features such as accessibility, walkability, seating, safety, or green infrastructure, interact with demographic or psychosocial variables to influence outcomes like sense of community, inclusion, or spatial satisfaction (X. Guo et al., 2022; Irvine et al., 2013; Portegijs et al., 2017). For example, a well-designed plaza may foster social cohesion among extroverted, mobile users, but may alienate older adults or individuals with sensory sensitivities if it lacks seating, shade, or legibility. In this way, P–E Fit enables a micro-ecological analysis of how different user groups relate to space based on their varying needs and the socio-spatial attributes of the environment.

More recent scholarship has advanced the concept by incorporating dynamic, transactional perspectives in terms of emphasising that fit is not a fixed condition but evolves over time through feedback loops between behaviour, perception, and environmental adaptation (Kyttä et al., 2018; Stoklosa et al., 2022). This aligns with relational views of public space as co-produced by spatial configuration, social practices, and governance structures. Fit, therefore, is not only physical or functional but also symbolic and emotional, shaped by how individuals interpret and internalise their spatial experiences, often through the lens of cultural background, identity, and memory (Aelbrecht & Stevens, 2019; Ujang & Zakariya, 2015).

In the context of social cohesion, P–E Fit contributes explanatory depth by highlighting how the same public space may promote community-building for some while reinforcing marginalisation for others. For instance, seemingly 'neutral' urban designs may reflect dominant socio-cultural norms that fail to accommodate the everyday rhythms, interactional styles, or cultural practices of diverse populations (Amin, 2008; Mehta, 2014). By foregrounding this mismatch, the framework helps illuminate subtle mechanisms through which inclusion and exclusion are produced at the level of lived experience.

Taken together, the Person–Environment Fit model provides both a diagnostic lens for assessing how effectively public spaces accommodate diverse user needs and a normative guide for shaping inclusive design and policy interventions. Its emphasis on the evolving relationship between individual capacities and environmental affordances that deepens the social–ecological framework's relevance to questions of equity, access, and cohesion. By exploring the micro-level conditions under which social inclusion or exclusion materialises, it strengthens the analytical bridge between spatial design, user diversity, and socially sustainable urban environments.

More broadly, the social–ecological perspective invites a systems-oriented understanding of public space as embedded within and shaped by interrelating physical,

social, and institutional structures. Through this lens, public space operates as a connective tissue through which form, function, governance, and lived experience converge. Social cohesion, in this context, acts as an emergent property of alignment or misalignment between spatial affordances, ecological conditions, institutional arrangements, and civic expectations. It is this relational, layered, and adaptive view that makes the social–ecological framework indispensable to the analytical orientation of understanding social cohesion in public space.

2.3.3 The Psychosocial Framework

While the social–ecological perspective offers a systems-oriented understanding of public space, attending to the alignment between spatial affordances, institutional structures, and user diversity, it remains incomplete without addressing the subjective and affective dimensions of place experience. The psychosocial framework complements this broader systems lens by focusing on how individuals perceive, interpret, and internalise their engagement with public environments (Chan et al., 2006; Forrest & Kearns, 2001; Talen, 1999). Rooted in social and community psychology, as well as environmental design theory, this perspective foregrounds the relational, symbolic, and emotional layers through which public space contributes to social cohesion. Rather than treating cohesion as a structural condition or behavioural outcome, the psychosocial lens conceptualises it as an emergent product of meaning-making, perceived inclusion, trust, and place attachment (Francis et al., 2012; S. M. Low, 2000). These processes are mediated by cultural narratives, prior experiences, and social representations that shape how individuals assess public space as welcoming, safe, familiar, or exclusionary (Y. Guo et al., 2021; Talen, 1999). In doing so, the framework reveals how the felt qualities of space, comfort, recognition, belonging, can significantly shape patterns of interaction, identification, and civic participation.

The psychosocial framework centres on how individuals perceive, interpret, and emotionally respond to public spaces, positioning social cohesion as a subjective, relational, and affective process. It synthesises insights from social psychology, community psychology, environmental psychology, and design studies to investigate how belonging, trust, perceived inclusion, emotional safety, and place attachment emerge through the lived and symbolic experiences of urban environments (Chan et al., 2006; Forrest & Kearns, 2001; Francis et al., 2012).

The psychosocial framework offers a relational and interpretive lens for understanding how individuals experience public space as a site of emotional resonance, symbolic meaning, and social negotiation. This perspective foregrounds the idea that space is always mediated, asserting that it is seen, felt, and interpreted through

the prism of personal history, social identity, and collective memory (Friedmann & Lessig, 1987; S. M. Low, 2009). Engagement with public space, therefore, cannot be reduced to physical affordances or observed behaviors alone. Instead, it is profoundly shaped by how people feel in and make sense of the spaces they inhabit (Lefebvre, 1991).

This approach challenges purely objective analyses of spatial use by emphasizing the subjective and intersubjective dimensions of place. The emotional and symbolic meanings that people ascribe to public spaces are critical to understanding their use and appropriation (H. Nguyen, 2019). For instance, a park might symbolize freedom and community for one group, while representing danger or exclusion for another, depending on their lived experiences and social backgrounds (Cattell et al., 2008b; S. Low & Smith, 2006). The framework reflects that the seemingly neutral built environment is a canvas upon which social identities are negotiated, power relations are enacted, and collective memories are preserved or contested (Gaffikin et al., 2010). Furthermore, drawing on symbolic interactionism (Blumer, 1986), the psychosocial tradition emphasises the co-construction of meaning between individuals and their environments. A bench may represent comfort to one user and surveillance to another, depending on cultural scripts, social roles, or past experiences. This has led to rich studies on intersectionality in public space, examining how age, gender, ethnicity, and disability mediate how spaces are perceived and used (Lee et al., 2018; C. Ortiz et al., 2025; Valentine, 2008; . R. Yu et al., 2019).

Together, the result is a nuanced account of space as a site of meaning-making, where personal and collective interpretations interact with material and social conditions to shape cohesion-related outcomes. Space becomes a symbolic medium through which actors perform identities, read social cues, and assess their place within wider societal structures. This process is deeply affective. Perceptions of safety, inclusion, visibility, or threat emerge both from objective features of the environment, and from prior experiences, cultural narratives, and the anticipatory emotions they generate. Theories of place meaning (Ujang & Zakariya, 2015) and affective geography (Anderson, 2023) reinforce this view, showing how public space becomes imbued with emotional significance, where personal and collective histories are mapped onto the built environment, and where attachment, alienation, or resistance are enacted.

In this light, public space operates as both a psychological landscape and a social field. It offers the potential for belonging, solidarity, and civic expression, and also for exclusion, surveillance, and symbolic violence. Individuals assess public settings both in terms of accessibility or design and with regards to social cues: who is present, who is welcome, who is seen or ignored. These perceptual judgments have cascading effects on emotional wellbeing, interpersonal trust, and social connected-

ness (Francis et al., 2012; S. M. Low, 2000; Mehta, 2009). For instance, perceived familiarity, social recognition, and informal surveillance are shown to enhance one's sense of ease and attachment in public settings, whereas feelings of discomfort, illegitimacy, or over-policing may trigger withdrawal or self-exclusion (Oidjarv, 2018).

Empirical work grounded in this tradition often utilises mixed and qualitative methods such as narrative interviews, photo elicitation, mental mapping, emotion mapping, and participatory walk-alongs to capture the non-visible dimensions of spatial experience, what scholars refer to as the intangible affordances of place (Kyttä et al., 2018; S. M. Low, 2000; Manuel et al., 2017; Mehta, 2014). These include comfort, symbolic visibility, perceived surveillance, recognition, aesthetic resonance, and collective memory. For instance, S. M. Low (2000) shows how historically marginalised communities experience public plazas as sites of both erasure and resistance, where social recognition is deeply tied to spatial inclusion and historical memory. Similarly, Mehta (2009) explores how informal encounters, seating arrangements, and visual access shape people's emotional security and willingness to linger or interact.

This framework is especially valuable in interpreting urban environments as emotionally and symbolically charged landscapes, moving beyond geometric or functional constructs. It supports the view that social cohesion emerges through the ongoing negotiation of meaning, recognition, and affect in space. In doing so, it bridges micro-level interpersonal dynamics with macro-level cultural and spatial structures, offering an indispensable lens for studying public space as a lived and contested domain (Ganji & Rishbeth, 2020; Simmel, 2009).

Taken together, these conceptual frameworks offer distinct yet complementary lenses through which to examine the complex relationship between public space and social cohesion. Each has emerged from a different disciplinary tradition, urban design and behavioural observation, systems-based ecological analysis, and psychosocial theory, bringing into focus particular dimensions of urban experience. The spatial–behavioural perspective foregrounds how the built environment structures opportunities for encounter and co-presence, emphasising visibility, accessibility, and the functional qualities of space that shape social behaviour (Aelbrecht, 2016; Cao & Kang, 2019; Mehta, 2009). Social–ecological perspectives, by contrast, draw attention to the dynamic interplay between individuals and their (social and physical) environments, highlighting how spatial and institutional conditions condition adaptive responses, community resilience, and differentiated access to social resources (Amin, 2002; Wickes et al., 2019). Psychosocial approaches, meanwhile, explore the lived and symbolic dimensions of public space, focusing on how perception, identity, memory, and emotional responses mediate experiences of safety, belonging, and exclusion (Y. Guo et al., 2021; Oidjarv, 2018; Scannell & Gifford, 2010).

Beyond their internal logics, these frameworks also map onto different domains of the public realm. The spatial–behavioural literature is most concerned with the affordances of physical design and the observable patterns of use that structure everyday interaction. Social–ecological work highlights structural and systemic conditions, such as spatial segregation, normative functions, governance regimes, and institutional accessibility, that shape who can participate and how (X. Guo et al., 2022; F. Wu, 2000). Psychosocial studies introduce an interpretive focus on meaning-making, acknowledging that affective and symbolic cues, such as cultural resonance, historical continuity, or embodied presence, are critical to how public space is experienced across diverse groups. Together, these perspectives reveal that social cohesion is continuously negotiated at the intersection of spatial, social, and psychological processes.

As such, the value of engaging with these frameworks lies in recognising the layered nature of public space and the multiple entry points through which cohesion may be enabled or constrained. Their analytical distinctions help surface critical tensions in the literature, for instance, between normative ideals of openness and empirical realities of territoriality (T. V. Nguyen et al., 2019; Ujang, 2012), or between observed social mixing and perceived exclusion (Dines et al., 2006b). Acknowledging these tensions allows researchers to more carefully assess the conditions under which design, perception, and structure interact to shape the possibilities for meaningful social connection in urban public life.

2.4 The Policy Landscape and Problem Space

2.4.1 UK Policy on Public Space and Social Cohesion

Urban public space has increasingly become a salient feature of diverse planning and public policy agendas, including placemaking (Reynolds, 2021), mobility (Barbarossa, 2020; Bertolini, 2020), public health (Alcaraz et al., 2020), social engagement and community development (Lawson, 2005), and environmental management and urban governance (Badach & Dymnicka, 2017; Zeng, 2023). Policymakers have long recognised the multifaceted roles public space plays in urban life, addressing priorities ranging from urban regeneration and community cohesion to public health and environmental sustainability (Bragalia & Caruso, 2020; Carmona, 2014; S. Low & Smith, 2006; Wolch et al., 2014; Worpole & Knox, 2008).

Scholars analysing public space policy engage with debates on governance and regulation (Punter, 1990), planning and design guidance (Zamanifard et al., 2018), funding mechanisms (Kirwan, 1989), community engagement (Konsti-Laakso & Rantala,

2018), and monitoring and evaluation practices (Dempsey & Burton, 2012). Despite this extensive discourse, the inherently complex and multifaceted nature of urban public space (Qi et al., 2024) complicates efforts to deliver coherent policy reviews capable of informing effective policy formulation and evaluation. Rather than focusing solely on urban design (Punter, 2007a), it is imperative to consider the broader creation and management of public space across intersecting urban and environmental policy domains.

In the UK, social cohesion policy has evolved alongside discourses of "social capital," "community cohesion," "Big Society," "British Values," and "equality," often shaped by immigration and ethnicity agendas (Lewis & Craig, 2014). Urban policy frameworks promoting diversity and community involvement frequently engage with religious difference, identity (Wetherell, 2007), and security narratives. Key policy documents such as the Integrated Prevent Strategy (2011), Equality Act (2011), and Guidance on Community Cohesion (2022) exemplify this trajectory. Over time, centrally defined cohesion initiatives have gradually shifted away from solidarity and multiculturalism towards emphasising the role of local communities in planning systems, social sustainability, urban regeneration, and community engagement (Woodcraft, 2015).

Despite the breadth and complexity of UK policy interests in public space and social cohesion, opportunities for radical new insights have diminished due to the volume and pace of discourse (Amin, 2002). Notably, policy integration between public space and social cohesion remains fragmented, with an absence of context-sensitive frameworks and a dominant focus on economic outcomes (Carmona, 2014). This fragmentation impedes the bridging of policy gaps and neglects the "everyday urban" interactions that shape lived experiences and community dynamics (Amin, 2006a; Parker & Karner, 2010). Such a narrowed policy perspective constrains theoretical advancement and practical application at the intersection of public space and social cohesion.

Consequently, the potential for new approaches lies in reorienting context and scope, as our research aims to do, contributing to a rich body of scholarship on public space (Aelbrecht, 2016; Carmona, 2010a) and social cohesion (Laurence, 2011; Taylor-Gooby, 2012) within the contemporary British policy context.

2.4.2 Policy Problem Structuring in Public Space and Social Cohesion

Public space and social cohesion are widely recognised as inherently complex, often classified as 'wicked' or 'ill-defined' policy problems (Dempsey & Burton, 2012;

Jenson, 2010). Their complexity stems from the interplay of multiple interdependent social, political, and environmental processes, as well as from the divergent perspectives of the actors involved in their governance (Skaburskis, 2008). These actors, ranging from municipal planners to community advocates, approach the "same" issue with different priorities, values, and problem definitions. As a result, the boundaries of "the problem" are fluid, negotiated, and often contested.

Such conditions undermine the applicability of conventional linear policy analysis methods commonly used in planning, operations research, and policy studies (Dunn, 2012; Head, 2019). Approaches built on stable, well-bounded variables struggle to account for the open-ended, socially constructed, and evolving nature of these phenomena. Moreover, problem representations are not static. They shift in response to changes in political priorities, economic cycles, demographic shifts, and environmental pressures, factors that interact across governance levels and policy arenas (Yassim, 2019).

Recognising this, our analytical stance treats public space and social cohesion as multi-scalar, socially mediated systems. The challenge is not simply to identify "solutions" but to illuminate how different interpretations of the problem are constructed, negotiated, and embedded within broader institutional, spatial, and cultural contexts. This view aligns with Dewey (2018)'s pragmatic account of "problem situations" as complex, uncertain, and indeterminate conditions requiring iterative inquiry rather than definitive resolution (Dewey, 2018; Dunn, 2012).

In the context of this thesis, these theoretical insights guide how we approach the problem structuring of UK policies on public space and social cohesion. They highlight why such policies cannot be meaningfully understood through a single disciplinary or sectoral lens. Public space provision, design, and governance intersect with community development, urban safety, health, and equality agendas; each policy domain carries its own priorities, evaluative criteria, and implicit definitions of cohesion (Phillimore, 2012b). This multiplicity produces overlapping, and at times competing, framings of what constitutes a "problem" and what outcomes are worth pursuing.

Therefore, policy problem structuring allows us to examine how different policy framings either reinforce or undermine the conditions that foster cohesion, and to identify where critical gaps in integration persist. Such an approach is particularly relevant for the UK policy environment, where spatial and social objectives are often embedded in parallel strategies, i.e., urban design guidance, planning frameworks (Carmona & Sieh, 2008), public health strategies, and community cohesion policies (Ratcliffe, 2012), that are rarely evaluated together.

This framing provides the conceptual bridge between the discussions in this chapter and the policy-focused analysis in Chapter 5. Whereas the present chapter outlines the theoretical underpinnings and defines the multi-dimensional nature of the public space–cohesion nexus, the Structured Policy Review applies these insights to explore how planning and public policy frameworks articulate, operationalise, and measure these concepts in practice. Together, they establish the analytical foundation for the empirical studies that follow.

2.5 Theoretical Gaps and Research Rationale

Extensive scholarship has examined public space and social cohesion, yet critical theoretical and empirical gaps persist that constrain a full understanding of how these phenomena interact in diverse urban contexts, for exmaple, inconsistency in assessed social cohesion outcomes (Qi et al., 2024), lack of cross-context comparison and cross-disciplinary intergation (X. Guo et al., 2022), fail to recognise the complexities of interactions, the multiplicity of user needs (Aelbrecht, 2016). These gaps undermine both the development of robust theory and the translation of knowledge into effective policy and practice, necessitating an integrative, methodologically rigorous approach(Bozkurt, 2016; Rucks-Ahidiana & Bierbaum, 2015; Winkel et al., 2009a).

A primary limitation lies in the compartmentalisation of spatial, behavioural, and psychosocial perspectives. Spatial analyses often focus on measurable aspects of physical form and usage patterns but insufficiently incorporate the lived, negotiated experiences of diverse users (e.g., Amran and Fuad (2020) and Zerouati and Bellal (2019)). This results in a partial view that overlooks how spatial configurations are actively interpreted, contested, or adapted in everyday social life. Meanwhile, psychosocial research foregrounds individual perceptions and affective responses but frequently neglects the embedding of these experiences within concrete spatial and behavioural contexts (e.g., Mantey (2015) and Mullenbach et al. (2022)) Behavioural studies, while illuminating interaction patterns (e.g., Can and Heath (2016) and Cao and Kang (2019)), often do so without integrating the symbolic and perceptual dimensions that shape and give meaning to those behaviours. This disciplinary siloing hampers theoretical synthesis and impedes a comprehensive account of social cohesion as a complex, relational, and context-dependent process.

Empirical investigations typically lack sufficient cross-contextual breadth and depth. Many studies focus narrowly on singular urban sites or specific demographic groups (Dash & Thilagam, 2022; Ganji & Rishbeth, 2020), limiting the generalisability of findings and obscuring broader structural or cultural patterns. There is an ur-

gent need for research designs that systematically compare social cohesion processes across diverse spatial typologies, temporal rhythms, and socio-cultural milieus. Such comparative work can reveal both context-specific dynamics and transferable mechanisms, enhancing the external validity and policy relevance of findings (Dempsey et al., 2011).

The disjuncture between scholarly insights and public space policy remains profound. Policy frameworks overwhelmingly emphasise design quality, safety, and participation metrics (Carmona & Sieh, 2008), but systematically underrepresent the behavioural and relational mechanisms that underpin cohesion. This results in evaluative frameworks that are largely aspirational, lacking rigorous, standardised tools to measure the nuanced, multi-dimensional nature of social cohesion in practice (chapter5). The absence of such metrics constrains the capacity for evidence-based policy formulation, implementation, and post-occupancy evaluation, ultimately limiting the effectiveness of interventions aimed at fostering inclusive and cohesive public spaces.

This constellation of gaps collectively frames the rationale of our research. There is a clear imperative to develop and deploy an integrative conceptual framework that bridges spatial form, social behaviour, and psychosocial experience within a unified empirical strategy. This integration supports the generation of rich, multi-layered insights capable of informing both academic theory and practical policy.

Moreover, addressing these gaps demands methodological rigour and conceptual clarity to ensure that complex, multidimensional phenomena are meaningfully operationalised and measured. Our search responds to this challenge through adopting conceptual frameworks via a multi-lense approach. This approach enables the triangulation of quantitative and qualitative data, ensuring construct validity and interpretive depth.

More importantly, it situates cohesion as a dynamic social-spatial process shaped through patterned behavioural routines, adaptive spatial strategies, and affective resonances(Aelbrecht, 2016; Ganji & Rishbeth, 2020; Wickes et al., 2019). Furthermore, it reveals a significant disjuncture between these complex behavioural and relational dynamics and prevailing public space policy framings. Current policies tend to emphasise design, safety, and participation metrics while overlooking the nuanced social processes through which cohesion is experienced and produced. This gap highlights the need to critically engage with policy as both context and constraint, situating the research within a real-world problem space where broad social cohesion ambitions struggle to translate into effective, evidence-based interventions (Kearns & Forrest, 2000; Robinson, 2005).

2.6 Conclusion

This chapter has established the theoretical and policy foundations for our research into the relationship between public space and social cohesion. It situates the thesis within foundational academic and policy discourse on public space and social cohesion. It consolidates key definitions, conceptual dimensions, and research frameworks, mapping how core constructs are understood and operationalised across both scholarly traditions and applied policy context. Our review has shown that persistent gaps undermine both theoretical progress and practical effectiveness. Chief among these are the inconsistent operationalisation of cohesion outcomes, the lack of cross-context and cross-disciplinary integration, and the limited recognition of the complex, negotiated nature of interaction in public space.

A central problem is the compartmentalisation of spatial, behavioural, and psychosocial perspectives. Spatial analyses often measure physical form and usage patterns without incorporating the lived experiences of diverse users; psychosocial research foregrounds perceptions but neglects the embedding of these experiences in material and behavioural contexts; and behavioural studies, while mapping interaction, often omit the symbolic and perceptual dimensions that give those behaviours meaning. This fragmentation yields partial accounts of cohesion, limiting explanatory power and reducing relevance for real-world decision-making.

Policy frameworks reveal a similar disjunction. While design quality, safety, and participation rates remain important, they are insufficient proxies for the relational mechanisms through which cohesion is actually produced. Without integrating behavioural and perceptual measures, public space policy risks overlooking the very processes that determine whether spaces are genuinely inclusive. As demonstrated in our policy review, current evaluation tools lack the conceptual and methodological scope to capture the multi-dimensional nature of cohesion, leading to aspirational rather than operational outcomes.

In sum, this chapter provides three critical foundations for the thesis. First, it establishes a coherent conceptual architecture that ensures analytical clarity and consistency across empirical chapters. Second, it situates the research within a defined policy and practice problem space, attending to both structural constraints and normative ambitions surrounding public space and cohesion. Third, it sets the stage for the mixed-methods approach detailed in Chapter 3, by delineating the theoretical scaffolding through which the interaction between spatial characteristics, social behaviour, and individual perception can be examined across diverse urban contexts and scales.

Chapter 3

Methodology and Research Design

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3.1 Introduction

This chapter outlines the methodological foundations of the thesis and explains how its multi-method design addresses the core research aim: to investigate how public space characteristics, social interactions, and psychosocial perceptions shape social cohesion across urban contexts. The research design is situated within a mixed-methods framework informed by a pluralistic epistemology, combining interpretive, behavioural, and statistical approaches across five empirical components.

This pluralistic strategy is underpinned by two guiding imperatives. It aims to capture the multidimensional and situated nature of social cohesion in public space, spanning spatial configurations, observed behaviours, and subjective experiences. On the other hand, it ensures analytic continuity across methods by aligning each stage with the theoretical constructs introduced in Chapter 2 and the empirical goals set out in Chapter 1. In doing so, the design preserves internal coherence while addressing a complex and layered phenomenon.

To operationalise this framework, the research is structured around five interrelated components:

1. A systematic literature review synthesising chemical studies on public space and social cohesion to establish the scope of existing research and methodological tendencies.

2. A structured policy review analysing UK public space and social cohesion policies, identifying institutional framings, implementation challenges, and measurement gaps.

3. A behavioural mapping study of observed activities in Sheffield public spaces, designed to uncover spatial and temporal patterns of social interaction and user group composition.

4. A large-scale UK–US online survey that models the relationships between perceived public space features, social interaction types, and social cohesion outcomes using moderation and mediation techniques.

5. A focus group study exploring lived experiences, perceived exclusion, and interpretive narratives of public space, contextualising statistical patterns within cultural and emotional meaning-making.

The overall design follows a sequential exploratory-confirmatory logic (Tashakkori & Teddlie, 2010). Insights from the literature and policy reviews informed the design of subsequent empirical instruments, while the behavioural mapping and survey findings shaped the thematic focus of the qualitative inquiry. This sequencing

enables both conceptual alignment and analytical triangulation, ensuring that each method contributes uniquely to a layered understanding of public space as a site of social production and cohesion.

The following sections detail the philosophical, analytical, and technical foundations of this design, clarifying the rationale and procedures behind each methodological choice.

3.2 Research Philosophy and Methodological Positioning

The methodological strategy adopted in this thesis is shaped by a pluralistic epistemological stance (Suri, 2013). This approach embraces the ontological and epistemological diversity inherent in studying complex, socially embedded phenomena such as public space and social cohesion. The research draws on complementary traditions, inclusing behavioural observation, statistical modelling, interpretive inquiry, and policy analysis, to navigate the multiple layers through which social cohesion is enacted, experienced, and governed.

At its foundation, the thesis assumes that public space is a relational construct: both materially configured and socially produced. This ontological stance is informed by social constructivism and pragmatism, which recognise that social phenomena are co-constituted by spatial, behavioural, and perceptual dimensions, and are best understood through both observable patterns and subjective accounts (Creswell & Clark, 2017; Flyvbjerg, 2001). This view supports the use of diverse empirical tools, ranging from observational fieldwork to statistical mediation models and qualitative thematic coding, each capturing different but overlapping layers of meaning and action.

The pluralistic positioning also reflects the interdisciplinary nature of the research problem. The core constructs, public space, social interaction, and cohesion, are situated at the intersection of urban design, environmental psychology, and spatial sociology. As such, the research design moves across analytical levels (individual, group, spatial setting, and policy regime), methodological paradigms (positivist, interpretivist, critical–realist), and data types (quantitative, qualitative, and spatial), without collapsing them into a single evaluative frame (Morgan, 2007). Instead, methodological choices are driven by the explanatory needs of each research question and the conceptual frameworks established in Chapter 2.

This stance enables the research to pursue both explanatory and interpretive goals. Behavioural mapping and survey modelling allow for generalisable insights into the

structural and spatial correlates of cohesion, while focus groups and policy reviews reveal the situated experiences, meanings, and governance challenges that statistical models cannot capture. The result is a methodologically layered design that views complexity as a feature to be systematically explored (Tashakkori & Teddlie, 2010).

In summary, the research philosophy guiding this thesis is defined by:

- **Ontological Relationalism:** Public space and cohesion are understood as emergent from interactions among people, place, and policy.
- **Epistemological Pluralism:** Knowledge is situated, partial, and best produced through multiple methods that reflect diverse ways of knowing.
- **Methodological Pragmatism:** Method choices are driven by research questions and analytical goals, by moving beyond disciplinary convention.

This positioning enables the integration of rigorous, context-sensitive empirical work across multiple scales, providing a robust foundation for the subsequent analytical framework and empirical methodolgical sections.

3.3 Multi-Lens Analytical Framework

To operationalise the research aim and ensure analytical coherence across methods, this thesis adopts a multi-lens analytical framework comprising three complementary perspectives: the *spatial–behavioural*, *social–ecological*, and *psychosocial* lenses. These lenses serve as structuring devices, each foregrounding a particular aspect of the public space–cohesion relationship, and collectively enable a layered understanding of how social cohesion is spatially configured, socially enacted, and subjectively experienced.

3.3.1 Purpose and Rationale

The adoption of multiple frameworks reflects the conceptual complexity of the research object. Public space and social cohesion emerge at the intersection of physical form, social practice, institutional design, and subjective meaning. This framework was developed iteratively: first as a heuristic to align the conceptual and empirical strands of the research, and then as a practical guide to data analysis, synthesis, and interpretation.

3.3.2 Lens 1: Spatial–Behavioural

The spatial–behavioural lens examines how the built environment affords, enables, or constrains observable social behaviours in public space (Aelbrecht & Stevens, 2023;

Hillier, 2002). It guides both the behavioural mapping study and the interpretation of physical design features within the survey models.

3.3.3 Lens 2: Social–Ecological

The social–ecological lens conceptualises public space as embedded within urban systems, where spatial form (Aelbrecht, 2016), institutional regulation (Carmona, 2010b), and demographic dynamics (Simmel, 2009) co-produce outcomes of inclusion, exclusion, resilience, and social sustainability (Lawton & Nahemow, 1973; Stoklosa et al., 2022). It guides the structuring of survey analysis, the segmentation strategy in the behavioural study, and the assessment of spatial-temporal rhythms in relation to group composition.

3.3.4 Lens 3: Psychosocial

The psychosocial lens focuses on the subjective, affective, and symbolic dimensions of public space engagement (Gifford, 2007). This lens is operationalised through perception-based moderators in the survey, and interpretively explored in the focus group study. It allows the thesis to account for experiential asymmetries and identity-based exclusions not captured by physical or structural analysis alone.

A visual schema (Figure 3.1) illustrates how the lenses operate across different empirical stages. This framework enables the thesis to move beyond method-specific silos, supporting cross-context synthesis and layered interpretation in Chapter 9. By clarifying the distinct but complementary roles of each lens, this framework provides the analytical framework for the mixed-method strategy that follows.

3.4 Mixed-Methods Strategy

This thesis adopts a mixed-methods research strategy to investigate how public space characteristics, social interactions, and psychosocial perceptions shape social cohesion across urban contexts. The use of multiple methods is foundational to the research logic. It reflects a pluralistic epistemological stance that recognises the multidimensional nature of the public space–cohesion relationship, and the need to engage both measurable structures and lived experiences across spatial, behavioural, and perceptual domains (Pawson & Tilley, 1997).

3.4.1 Philosophical Justification

The mixed-methods design is grounded in a pragmatic paradigm, which prioritises methodological appropriateness to the research question rather than allegiance to a

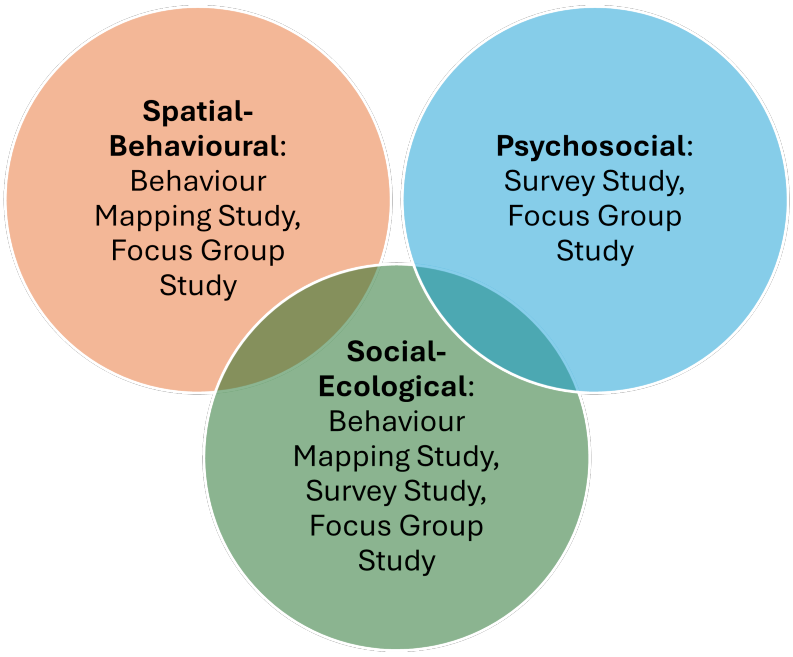

Figure 3.1: Multi-lens analytical framework guiding empirical design and interpretation across the thesis.

single epistemological tradition (Creswell & Clark, 2017). It also reflects a systems-oriented ontology consistent with the multi-lens framework introduced in Section 3.3, in which public space outcomes emerge from the interaction of physical affordances, ecological fit, and psychosocial meaning-making. Quantitative methods provide explanatory and predictive power across larger samples and spatial scales, while qualitative and interpretive methods capture situated meanings, contextual nuance, and experiential asymmetries.

3.4.2 Design Logic and Sequencing

The research design follows a sequential, exploratory–confirmatory logic (Ivankova et al., 2006), structured across five empirical components:

1. **Systematic Literature Review (SLR):** Scopes empirical studies on public space and social cohesion, identifying research gaps and methodological limitations to inform subsequent data collection and variable selection.

2. **Structured Policy Review (SPR):** Examines how public space and social cohesion are framed within UK policy discourse, establishing the institutional and normative landscape for the research.

3. **Behavioural Mapping Study:** Provides spatial and temporal evidence of social interactions and group dynamics across Sheffield public spaces, identifying behaviourally salient patterns of use.

4. **Survey Study:** Tests theorised relationships between spatial features, social interaction types, perceptual moderators, and cohesion outcomes across UK and US urban populations.

5. **Focus Group Study:** Captures in-depth perspectives on public space experience, lived exclusions, and interpretive meanings, providing narrative depth to complement survey and observational findings.

Each stage is methodologically independent yet conceptually integrated. Insights from the SLR and SPR directly informed the construct operationalisation and instrument design for the behavioural mapping and survey components. Patterns and tensions identified in those components shaped the focus group prompts and analytical coding strategies. This design enables conceptual refinement across stages and facilitates triangulation at both variable and theme levels.

3.4.3 Integration and Triangulation

Mixed-methods integration is operationalised at three levels:

- **Design-Level Integration:** The multi-lens framework ensures analytical consistency across methods by aligning data collection and analysis procedures with the spatial–behavioural, social–ecological, and psychosocial dimensions.

- **Interpretive Integration:** Findings are brought into dialogue across methods to support interpretive synthesis. For example, clusters identified in behavioural mapping are compared to survey-defined demographic predictors, while qualitative insights from focus groups contextualise or challenge survey findings.

- **Triangulation:** Methodological triangulation is achieved by analysing the same phenomena (e.g., sociability, inclusion) using multiple lenses, tools, and data sources. This strengthens validity by revealing converging, complementary, or contradictory findings across contexts (Jenner et al., 2004).

This strategy provides the methodological foundation for the empirical studies that follow. It enables a cumulative, layered investigation into the conditions under which public space contributes to social cohesion, across design, behaviour, and perception.The next sections outline the data collection and analytical procedures for each empirical component, following the sequence: SLR, SPR, Behavioural Mapping, Survey Study, and Focus Group Study.

3.5 Phase One: Systematic Literature Review

The systematic literature review was conducted following the guide developed by Okoli (2015). This systematic approach was chosen because it offers a replicable, transparent, and rigorous methodological approach which is well suited to represent the best knowledge needed for studying interdisciplinary research topics such as understanding the relation between public space and social cohesion.

3.5.1 Search Strategy

A selection of keywords was included for search queries based on the research questions to identify empirical research studies published peer-reviewed research articles including both journal articles and conference papers. We selected peer-reviewed articles that were published during 2000-2023 because social cohesion has been recognized as a concept built around shared social values and varies according to its social context since 2000 (Kearns & Forrest, 2000). The search keywords for social cohesion was selected based on the theoretical framework suggested by Aelbrecht et al. (2021). The selection of search keywords for public space was chosen based on the public space typologies adapted by the UN-Habitat for the purpose of monitoring and reporting SDGs given the report was developed on the account of global partnerships (UN-Habitat, 2015). Table 3.1 shows the search strings/keywords include different search queries.

Studies were identified by a search of three databases on February 2nd, 2023 and February 22nd, 2023 including Web of Science (WoS), PubMed, and SCOPUS. The choice of databases was motivated by an initial scoping of the literature in the research area (Levy & Ellis, 2006). The search strings were entered for advanced query search building by using field tags including “Topics”, “Title”, “Abstract”, “Author Keywords”, and “Keywords”. Boolean Operator OR was used for covering the most common synonyms founded in the research area. Boolean Operator AND was used to link two sets of the search queries. These search terms were used in the same manner to search the three databases.

3.5.2 Study Selection Process

After the initial search with keywords, the study selection process had three further stages (Figure 3.2). Firstly, pilot screening steps were carried out on the databases involved by refining the search results to specific fields of study. The research results from the SCOPUS database were refined to subject areas under the categories of social science, environmental science, behavioural sciences, computer science, and multidisciplinary. In the Web of Science database, the search results were further

Table 3.1: Search query terms used for the systematic literature review

Search Query	**Strings / Keywords**
Public spaces	"common space" OR "outdoor space" OR "urban environment" OR "urban spaces" OR "public spaces" OR "public space" OR "city centre" OR "town centre" OR "built environment" OR "urban street" OR "street" OR "neighbourhood environment" OR "open space" OR "markets" OR "communal space" OR "in-between space" OR "neighbourhood space" OR "square" OR "plaza" OR "playground" OR "third place" OR "fourth place" OR "walking environment" OR "social environment" OR "community place" OR "public place"
Social values	"social support" OR "social" OR "sociality" OR "social relationship" OR "social ties" OR "social cohesion" OR "social capital" OR "sense of community" OR "social interactions" OR "sense of place" OR "social value" OR "social integration" OR "community cohesion" OR "place attachment" OR "social inclusion" OR "social network" OR "social relations" OR "placemaking" OR "social wellbeing" OR "social sustainability" OR "social benefit" OR "social activities" OR "public life" OR "social life" OR "urban life" OR "life between buildings" OR "placeness" OR "social engagement" OR "collective efficacy" OR "social identity" OR "place identity"

restricted to Web of Science Categories covering Public Environmental Occupational Health, Urban Studies, Environmental Studies, Geography, Regional Urban Planning, Environmental Sciences, Sociology, and Social Science Interdisciplinary. The non-human studies from the search result from PubMed were excluded. Second, title screening was conducted based on the inclusion and exclusion criteria (Table B.1). The criteria were developed based on the aim of this SLR and to address our research questions. This was followed by the third stage, in which the selection process was conducted based on the abstract and the full text reading assessment regarding the inclusion and exclusion criteria.

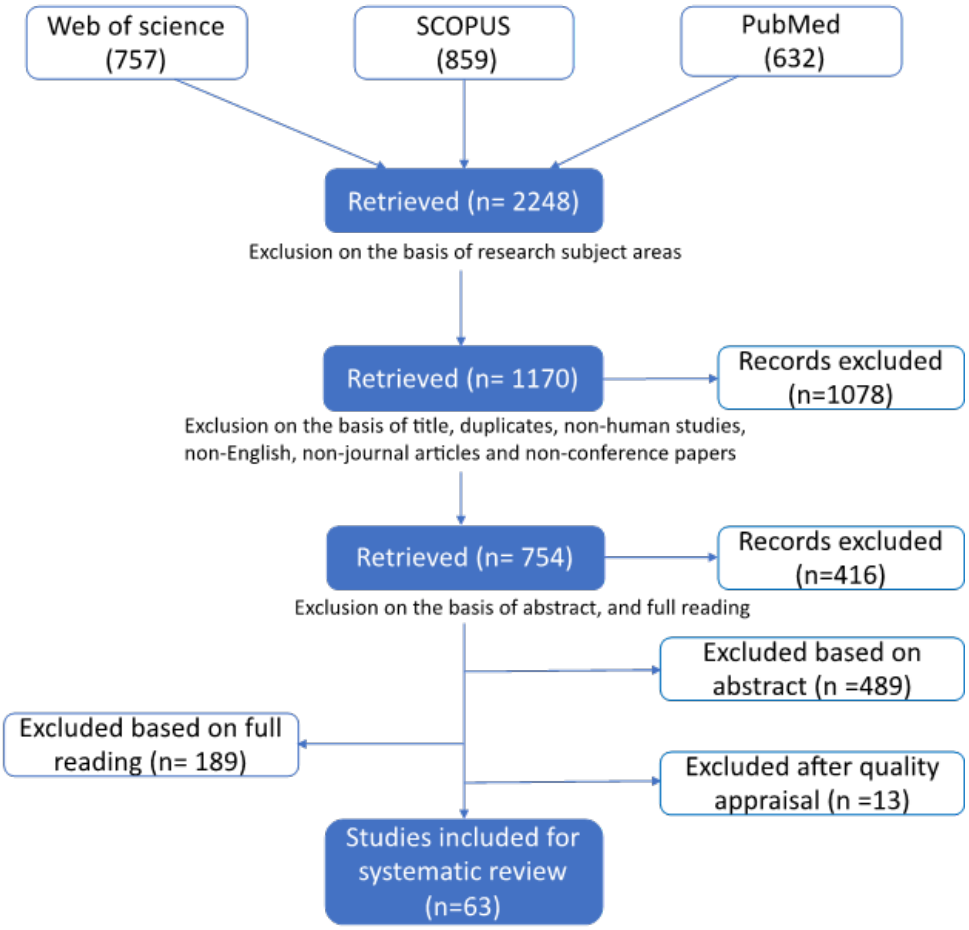

Figure 3.2: Study Selection Process.

3.6 Phase Two: Structured Policy Review

3.6.1 Research Approach: A Structured Policy Review

This structured policy review provides a strategic approach to address the inherent complexity of public space and social cohesion by emphasising key perspectives that constitute relevant policy spaces. These include the implications of problem

structuring (Dunn, 2012), the role of conceptualisation and operationalisation in policy formulation (Jordan & Turnpenny, 2015), the evolution of policy agendas, and major policy debates and critiques across different problem spaces (Figure 3.3).

The proposed structured policy review consists of four principal components:

- Identifying relevant policy frameworks;
- Understanding the conceptualisation and operationalisation of public space and social cohesion in relation to policy formulation (Jordan & Turnpenny, 2015);
- Tracing the evolution of policy agendas and alternatives across policy sectors, governance levels, and temporal phases (Kingdon, 1995);
- Engaging with key policy critiques and debates.

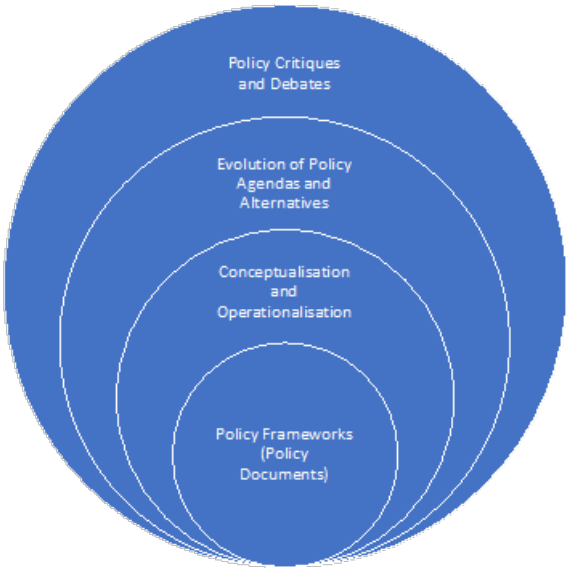

Figure 3.3: Principal components of the structured policy review methodology.

Ill-structured policy problems such as public space and social cohesion can become more well-structured over the course of their institutional resolution, depending on the complexity and multiplicity of problem formulations put forward, or left unarticulated, by diverse stakeholders (Dunn, 2012). These processes include the conceptualisation and operationalisation of key constructs, the evolution of agenda-setting processes and policy alternatives, the critical debates that shape policy implementation, and the relationship between policy and academic research.

To capture these elements, the structured policy review is designed in eight sequential stages (Figure 3.4).

In particular, Stage 2 of the review is informed by rigorous methodologies drawn from policy-related research. Alidoust et al. (2022) demonstrate the utility of sys-

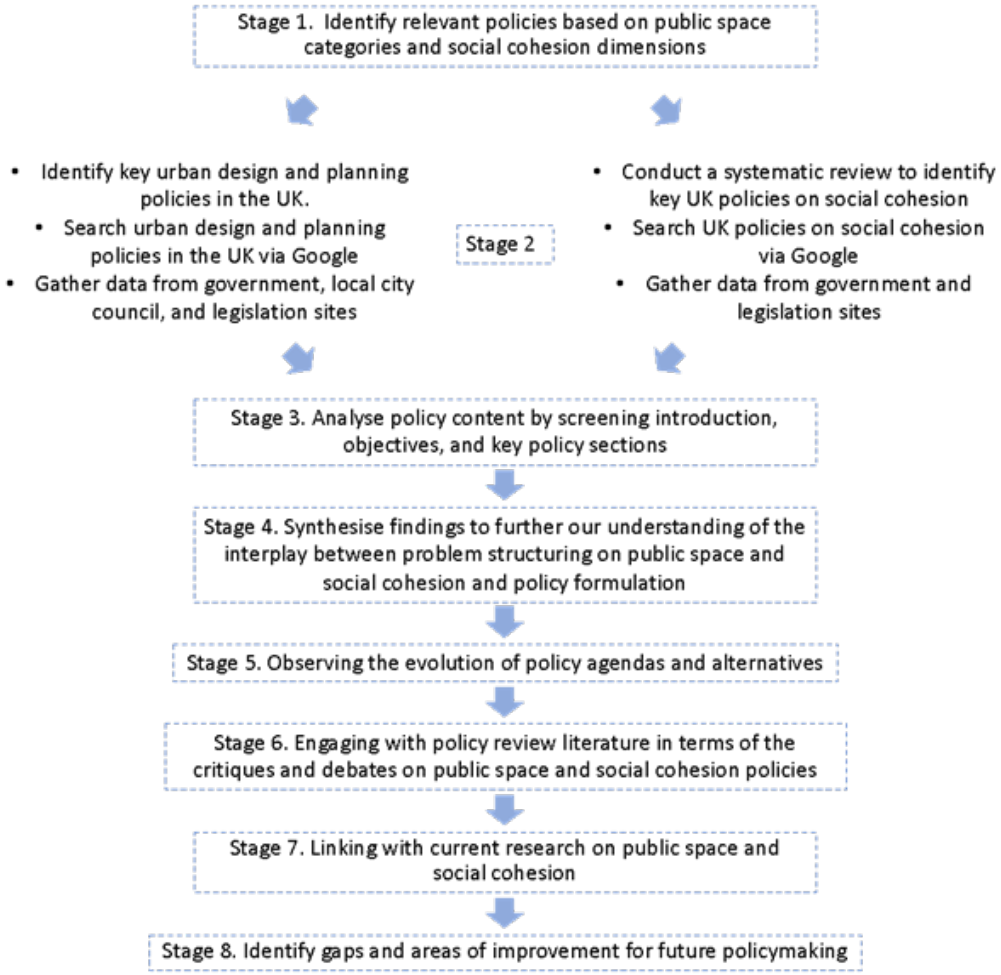

Figure 3.4: The structured policy review process.

tematic reviews for identifying and categorising policy instruments, particularly in the context of community wellbeing. While their study focused on evaluating policy outcomes, our review adapts their methodology exclusively for policy identification. Likewise, Benton et al. (2013) offer a structured framework for policy principles analysis, which informed our transparent compilation of relevant policies. Although Capacci et al. (2012) centre their review on policy effectiveness, their emphasis on methodological transparency supports the replicability of our own review process.

By focusing on policy identification rather than evaluation, this systematic review provides a comprehensive foundation for the subsequent analysis of UK policy frameworks on social cohesion. The final stage of the review explicitly connects the policy analysis to current academic literature, enabling a meaningful dialogue between theoretical framings and applied policy discourse.

Taken together, this structured methodology enables a systematic exploration of both the theoretical and practical dimensions of public space and social cohesion policy. It offers a robust analytical framework for identifying conceptual gaps, thematic divergences, and opportunities for more integrative policy development in terms of positioning the findings at the intersection of academic rigour and applied relevance.

3.6.2 Identifying Key Policies on Public Space and Social Cohesion in the UK

Urban public space is a key component of the UK's urban design and planning policy landscape. The *National Planning Policy Framework (NPPF)* and the *National Design Guide* are among the most cited policy documents in discussions of public space design and implementation (N. Harris & Thomas, 2004; Paterson, 2012). However, it is widely acknowledged that the private sector plays a growing role in the governance of contemporary public spaces, often through partnerships with local councils. These arrangements frequently involve private actors assuming full responsibility for the design, reproduction, control, and management of public spaces (Carmona, 2010a; Dempsey & Burton, 2012).

This shift has blurred the distinction between regulatory and discretionary systems in the delivery of public spaces in the UK, making local planning guidance increasingly vital. The implications for local communities are significant, as these design decisions influence access, control, and social performance of public environments (Punter, 2007a). Consequently, a review was conducted of how policymakers across major UK cities address public space within various design and policy frameworks (Table G.1). Cities were selected to reflect core municipalities supported by the

Levelling Up Fund (Ward, 2024), and were further filtered based on the availability of open-access policy documents via local authority websites.

To identify key UK policies on social cohesion, a systematic literature review was carried out in October 2024 using the PRISMA 2020 guidelines (BMJ, 2021). The review employed structured search strings based on core dimensions of social cohesion across two major databases:

- **Web of Science:**
  ```
  TI=(social cohesion OR inclusion OR integration OR community cohesion
  OR social capital) AND
  TI=(policy framework OR strategy OR policy OR initiative OR act) AND
  TS=(UK OR England OR United Kingdom)
  ```
- **Scopus:**
  ```
  TITLE-ABS-KEY(social AND cohesion OR inclusion OR integration OR
  community AND cohesion OR social AND capital) AND
  TITLE-ABS-KEY(policy AND framework OR strategy OR policy OR
  initiative OR act OR policies) AND
  TITLE-ABS-KEY(UK OR United AND Kingdom OR England) AND
  (LIMIT-TO(DOCTYPE,"ar") OR LIMIT-TO(DOCTYPE,"ch")) AND
  (LIMIT-TO(EXACTKEYWORD,"United Kingdom")) AND
  (LIMIT-TO(SUBJAREA,"SOCI"))
  ```

The screening process involved title and abstract reviews, followed by full-text assessments using pre-defined inclusion and exclusion criteria (Table C.1). These criteria were designed to identify the most relevant peer-reviewed policy studies focused on UK social cohesion policy frameworks. Selected studies were analysed to extract insights into different "policy spaces" that is, the different ways social cohesion problems are framed and addressed in policy (Table G.2). Policies were included if they were available online and feasible to review within the scope of the project.

3.7 Phase Three: Behaviour Mapping Study

3.7.1 Study Design

This study adopts behaviour mapping techniques (Del Aguila et al., 2019) using a Public Participatory Geographical Information System (PPGIS) platform called MerginMaps [1]. The goal is to map everyday social interactions observed via structured observations in Sheffield's city centre and residential neighbourhood public

[1] https://merginmaps.com/

spaces.

The technique is selected for its capacity to capture physical-functional features of urban settings (Subiza-Pérez et al., 2019) and understand spatial-temporal dimensions of social behaviour. Observation focuses on how user groups engage in everyday interactions vital to urban social cohesion (Mehta & Bosson, 2021).

3.7.2 Study Locations

Locations were selected to reflect typologies identified in the literature review: public open spaces, streets, fourth places, public commercial services, and public facilities. Due to feasibility constraints, public commercial services and facilities were excluded. Only highly accessible spaces were selected to ensure data quality (Mehta, 2019b).

Table 3.2: Study locations for field observation

Location	**Typologies**	**Urban Context**	**Physical/Spatial Features**
Peace Gardens	Public open space	City centre	Street furniture, water feature, green space, high legibility and permeability
Division Street	Street, fourth places	City centre	Mixed use, pedestrian infrastructure, signage, active frontages
Western Bank Park	Public open space	City centre	Street furniture, water feature, near university and hospital, open layout
Botanical Gardens	Public open space	Residential neighbourhood	Botanical landscape, green space, furniture, proximity to affluent areas
Ecclesall Road	Street, fourth places	Residential neighbourhood	Mixed use, pedestrian-friendly, signage, transport access

3.7.3 Data Collection

Observations took place between August 2023 and July 2024, targeting temporal diversity and capturing routine public life (Aelbrecht, 2016; Mehta & Bosson, 2021). Observations were conducted during:

- All four seasons, dry weather only.
- Weekdays: 11am–2pm and 4pm–6pm.
- Weekends: Winter 10am–4pm; Summer 10am–6pm.
- Observation lengths ranged from 15–30 minutes.

Social interactions were mapped using MerginMaps (see Appendix D.1) with supplementary field notes. Observers recorded attributes based on visible cues (Table 3.4).

Table 3.3: Selected observation times and conditions

Time Conditions	**Selected Times**	**Observation Details**
All seasons (dry weather)	Weekdays and weekends	15–30 min structured observations at discreet vantage points across each site
Daylight hours	Weekdays: 11am–2pm, 4–6pm Weekends: Winter 10am–4pm Summer 10am–6pm	Targeted peak periods; duration adjusted by crowd level and space dynamics

Table 3.4: Attributes recorded in MerginMaps during fieldwork

Attribute	**Information Options**
Observation index	Index number of recorded group
Timestamp	Automated
Location	Peace Gardens, Division Street, Western Bank Park, Ecclesall Road, Botanical Gardens
Gender	G1: Female, G2: Male
Ethnicity	E1: Asian, E4: SE Asian, E2: Black, E3: White, E5: Mixed
Life stage	LS1: Toddler, LS2: Teenager, LS3: Adult, LS4: Elderly
Social interaction	P: Passive, F: Fleeting, E: Enduring (Mehta, 2019b)
Social relationship	I: Intimate, P: Personal, S: Social (Cao & Kang, 2019)
Activity	W: Walking, L: Lingering, S: Stationary
Group size	1 to 5
Notes	Additional contextual notes

No data recorded was personally identifiable. Attributes were selected to capture patterns of everyday sociability and social interaction, in line with ethics approval guidelines.

3.7.4 Exploratory Data Analysis

Stage I: Pre-processing

Data collected using MerginMaps was initially exported and processed using QGIS and Microsoft Excel. Twelve monthly datasets were cleaned and standardised to ensure consistency in attribute formatting, coding, and spatial referencing. Pre-processing involved manual inspection for missing data, spatial misplacements, and formatting inconsistencies. Attribute fields were renamed and recategorised, and non-usable entries were removed. The refined datasets were exported as CSV files to support further statistical analysis and integration.

Stage II: Exploratory Data Analysis (EDA)

The twelve monthly CSV files were consolidated using Python to enable integrated exploratory analysis. Time-related attributes were systematically recoded into categorical segments: (1) time of day, (2) day of the week, (3) day type (weekday vs. weekend), and (4) season. EDA was conducted to examine the spatial and temporal distribution of observed behaviours across user demographics (e.g., gender, life stage, ethnicity), social interaction types (e.g., passive, fleeting, enduring), and social relationship categories (e.g., alone, intimate, personal, social). Descriptive statistics and visualisations including bar charts and stacked plots were used to surface patterns in how different user groups engaged with public spaces over time and across locations. This phase provided critical insight into behavioural regularities and variation, forming the empirical basis for the segmentation strategy described in the following section.

3.7.5 Advanced Data Analysis: A Spatial–Temporal Segmentation Approach

Building on insights from the EDA, a spatial–temporal segmentation strategy was developed to enable fine-grained analysis of behaviour patterns in relation to urban form and temporal rhythms. Spatial segmentation adopts a hierarchical nesting structure, distinguishing between the individual public space sites (e.g., Peace Gardens, Ecclesall Road) and their broader environmental context (e.g., city centre, residential neighbourhood, etc.). Temporal segmentation captures multiple time scales: hour of day, day of week, month, season, and day type (weekday/weekend).

Each observation is thus assigned to a unique segment defined by its spatio-temporal coordinates.

This composite segmentation enables the analysis of patterns such as "weekday mornings in the city centre" or "weekend afternoons in residential neighbourhood parks," allowing for meaningful comparison across both environmental and temporal dimensions. This segmentation framework provides the analytical basis for the subsequent cluster analysis. By organising the dataset into context-sensitive spatial, temporal, and demographic segments, it ensures that the clustering procedure operates on meaningful units of analysis. This allows latent behavioural patterns to emerge in a way that is both methodologically rigorous and directly aligned with the study's focus on identifying typologies of co-presence and marginalisation in public space use.

Conceptual Foundations

Our segmentation strategy draws from J. Wu (1999)'s hierarchical ecological framework, which emphasises the importance of multi-scale spatial and temporal units in understanding human-environment interactions. Public space use and social behaviour emerge from nested ecological processes operating across scales, ranging from broad urban environments to specific public spaces and momentary temporal intervals.

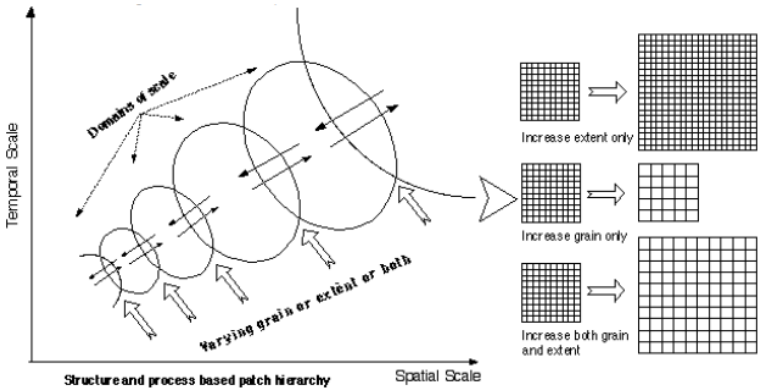

Figure 3.5: Hierarchical scaling or extrapolating information along a hierarchical scaling ladder from (J. Wu, 1999)

This theoretical foundation supports structuring the data into segments defined by combinations of spatial and temporal attributes (Figure3.5). Such segmentation captures the contextual variability in user group presence and behaviour patterns, accounts for the interdependent social and environmental factors shaping these behaviours, and aligns data organisation with established ecological and social theories (X. Guo et al., 2022; F. Wu, 2000).

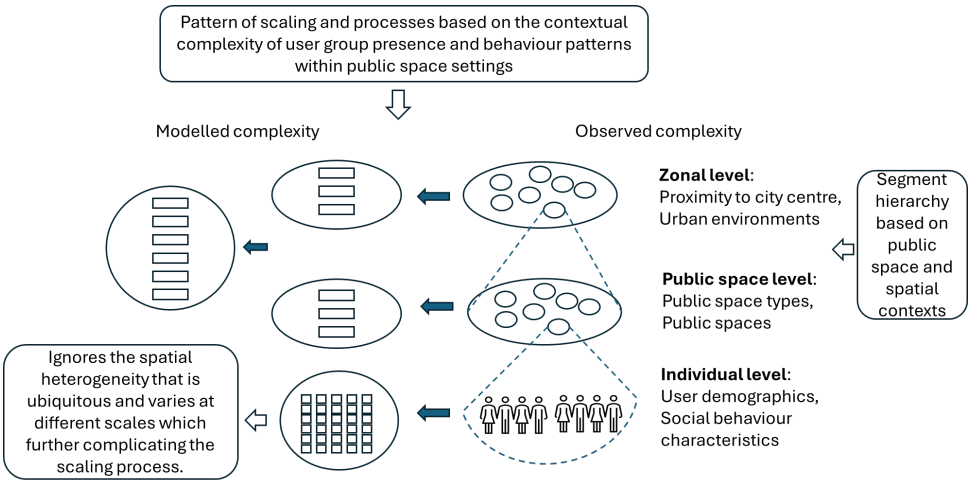

Figure 3.6: Illustration of the spatial-temporal segmentation process applied to public space observations, adapted from (J. Wu, 1999).

Figure3.6 visualises the spatial scaling process, illustrating how observational data points are grouped into segments based on public spaces and their spatial contexts, i.e., proximity to city centre[2] (Orum, 1998) (Figure 3.7), urban environment type (Aelbrecht, 2016; Francis et al., 2012). This hierarchical spatial framing, moving from individual public spaces to aggregated patches within defined spatial contexts, aligns with J. Wu (1999)'s ecological stratification framework and supports nuanced analysis across spatial scales (M. McPherson & Jetz, 2007). This multidimensional cross-classification captures the contextual complexity inherent in patterns of user group presence and social behaviour, enabling nuanced analysis of spatial-temporal dynamics.

Composite Profile Coding

A methodological novelty of this study is the development of composite profile codes to efficiently encode multi-dimensional user characteristics. These codes combine demographic variables such as ethnicity, life stage, and gender into succinct identifiers (e.g., *E2_LS1_G1* for Black female toddler). This coding system is informed by the ecological trait-based grouping strategies (López-Delgado et al., 2024), enables precise demographic representation within each segment and facilitating aggregation for count-based and mixed-effects analyses.

[2]The author acknowledges network modelling enabled walking radius such as 800m would have been more precise, although outside of the research scope. However, these intervals were chosen to be inclusive of additional travel mode such as public transport (García-Palomares et al., 2013)

Data Dependence and Statistical Implications

Observations within each segment are inherently interdependent, shaped by shared environmental, social, and temporal conditions (X. Guo et al., 2022). This clustering of behaviours reflects the ecological principle of environmental filtering (Sutton et al., 2021), where segment-specific contextual factors constrain and influence social activity patterns. Conventional statistical approaches (Bozkurt, 2016; Mehta & Bosson, 2021)that assume independent observations risk producing biased estimates by overlooking this structured dependence and the non-uniform stratification of user group presence and behaviour pattern. Consequently, the segmentation framework shifts the analytical focus from isolated individuals to the segment as the fundamental unit of study. This approach treats public space not as a neutral backdrop, but as an emergent product of intertwined social interactions and physical conditions, consistent with Lawton (1989)'s environmental press model. By modelling user presence and behaviour at the segment level, we capture the co-constitutive dynamics of space and social presence, appropriately accounting for within-segment dependencies and enhancing the validity of the inferences.

Operational Implementation

Segments are defined by the cross-classification of spatial setting, temporal interval, and composite user profile, collapsing individual-level observations into manageable, interpretable analytical units. Table 3.5 summarises the preserved relational structure within the dataset, linking segment identifiers to social behaviour, demographic composition, and spatial-temporal context.

(a) Public Space Locations (Colour code: yellow: Peace Gardens and Division; purple: Botanical Gardens and Ecclsall Road; red: Western Bank Park)

(b) Proximity to City Centre

Figure 3.7: Public space locations in relation to their proximity to city centre at 0.5km, 1km, 2km.

Table 3.5: Relational structure of segmented dataset

Entity	**Description**
Location	Public space, public space type, urban environment, distance to city centre, city
Time	Hour , day, day type (weekday/weekend), month, season
Segment Index (0-558)	Unique Location × Time combination (space-time unit)
User Group	Ethnicity, life stage, gender, and their combinations (e.g., `E1, LS2, E2_LS1_G1`)
Social Relationship Type	Alone, intimate, personal, social (counts per segment)
Interaction Type	Passive, fleeting, enduring (counts per segment)
Activity Type	Stationary, lingering, walking (counts per segment)

This approach balances granularity with parsimony (Zuur et al., 2009), enabling interpretability without oversimplification. It provides a robust foundation for the descriptive and inferential analyses that follow, directly addressing the research question concerning how spatial, temporal, demographic, and relational conditions shape social behaviour in urban public spaces.

Analysis of Behaviour Patterns and Group Presence

Having established the spatial and temporal segmentation strategy, this section turns to the analysis of *relational patterns of presence*. The aim is to move beyond static or isolated demographic classifications and instead examine emergent patterns of co-presence that reflect the lived, collective use of urban public space. To this end, an unsupervised machine learning pipeline is employed. The analysis follows a two-step process:

1. **Dimensionality Reduction via PCA**: Principal Component Analysis (PCA) is used to reduce the multivariate space of observed user attributes (e.g., life stage, gender, ethnicity, activity type, social interaction type, relationship group) into a smaller number of orthogonal components. This step preserves the most salient patterns of variation while mitigating multicollinearity and noise.

2. **Cluster Formation via K-Means**: The reduced dataset is then subjected to k-means clustering to group similar observations into distinct behavioural typologies. The optimal number of clusters is determined using the elbow

method, which balances model parsimony and explanatory power.

Each resulting cluster represents a composite behavioural profile, capturing recurring configurations of demographic, behavioural, and spatial-temporal attributes. These clusters function as mid-level analytic units: they are more granular than aggregate demographic summaries and more generalisable than location-specific descriptions. Importantly, they offer a way to interpret social presence as a structured and relational phenomenon, rather than a series of isolated behaviours.

3.7.6 Ethical Consideration

The ethical considerations arose for conducting the behaviour mapping study consists three key challenges which were addressed following the university ethics application protocols.

Firstly, field risk assessment was conducted with the risk assessment team officer at the Information School in terms of assessing the physical risks related to the field visits for behavioural mapping. This was done through meeting with the risk assessment team officer going through the behavioural mapping procedures in the field for risk assessment and additional meeting with the ethics application panel team to discuss the appropriate assignment of risk levels in relation to field visit details such as transportation, safety and security, etc. Risk assessment was approved and assigned by the Administrative team officer prior to the ethics application (Appendix E). Secondly, the ethics application was submitted for approval in terms of addressing any ethics concerns might arise during the field observation. During the application process, a thorough evaluation of the potential harms of this research to participants was clarified, leading to corresponding strategies to mitigate such risks in physically and emotionally protecting the researcher and the participants. Specifically, an information sheet detailing the purpose of and the data collection process of the behaviour mapping study was developed for the researcher to address the possibility of potential approach made by a member of public during behaviour mapping study (Kamalipour et al., 2023). Lastly, for the field study, key strategies were employed in response to reinforcing the ethics protocols and addressing the ethical concerns. Ethics approval was sought prior to the research (Appendix E). No explicit information was recorded via behaviour mapping or field notes that is unique enough to identify a member of the observed public. This approach considers the ethical implications and potential consequences in addition to tailoring the data collection process to best serve the studied communities (Kamalipour et al., 2023).

3.8 Phase Four: Survey Study

3.8.1 Survey Design

The survey was designed to test multiple pathways linking spatial characteristics, social interaction typologies, and social cohesion outcomes, with perceptual and sociodemographic variables as moderators (Qi et al., 2024). The questionnaire was developed through iterative piloting and refined for clarity, construct validity, and accessibility. The items on a 5- Likert scale were adapted from validated instruments in environmental psychology, urban studies, and sociology (Forrest & Kearns, 2001; Mehta, 2014; Zamanifard et al., 2019). Full item phrasings and response formats are available via Github[3].

The instrument was administered online via Qualtrics in two waves (UK and US), yielding a final sample of 638 valid responses. Quota sampling ensured demographic diversity by gender, age, and urban context. Ethical approval was obtained from the University of Sheffield (Appendix E).

3.8.2 Data Collection

The survey was distributed via Prolific in two rounds to ensure data quality and alignment with research needs. The first 300 responses were collected on 9 March 2024, followed by the remaining 338 responses on 3 August 2024. Prolific was selected for its wide use in academic research and its reputation for higher participant attentiveness in online experiments (Aelbrecht & Stevens, 2023). This is particularly important given the memory recall demands embedded in several survey items.

The following protocols and recruitment criteria were applied:

1. The external survey URL was integrated into Prolific, and an additional question was added to record participants' unique Prolific IDs for quality control purposes.
2. Participants located in the UK and US were recruited to ensure a sufficiently diverse respondent base.
3. The study sample was drawn using Prolific's representative demographic filters to enhance the generalisability of the findings.
4. No pre-screeners were applied to avoid introducing bias, as public spaces are by definition open and inclusive.

A total of 638 high-quality responses were collected, exceeding the recommended

[3]https://github.com/jieqi1214/psychosocial-analysis.git

sample size thresholds for mediation and moderation analyses in structural models (Askari et al., 2015).

3.8.3 Data Preparation

Stage i: Data Cleaning

Four CSV files were downloaded from the survey platform, representing the sociodemographic characteristics and survey responses across two rounds of data collection. Initial data inspection was conducted in Microsoft Excel to identify valid rows and columns. A total of 30 columns were retained after cleaning—five representing sociodemographic attributes (age, gender, ethnicity, employment status, and income level), and 25 representing item responses to the main survey constructs.

The datasets were joined by participant user IDs and merged into a single structured dataset using Python for further analysis.

Stage ii: Data Encoding

The cleaned dataset was encoded in Python using numeric values to represent survey responses in a structured format suitable for statistical analysis.

- **Likert-Scale Responses:** Items using 5-point Likert scales were encoded from 1 (strongly disagree) to 5 (strongly agree).
- **Interaction Frequency Items:** Social interaction frequencies were encoded as:
  - 1 = Less than once per month
  - 2 = 1–3 times per month
  - 3 = Once per week
  - 4 = 2–4 times per week
  - 5 = 5 or more times per week
- **Sociodemographic Variables:** Encoded using ordinal values as follows:
  - **Sex:** 1 = Male, 2 = Female
  - **Ethnicity (binary):** 1 = Not an ethnic minority, 2 = Ethnic minority
  - **Life Stage:** 1 = Age 18–24, 2 = 25–44, 3 = 45–64, 4 = 65–79, 5 = 80+
  - **Income Level:** 1 = High, 2 = Upper-middle, 3 = Lower-middle, 4 = Low

  - **Employment Status:** 1 = Full-time employed, 2 = Part-time employed, 3 = Unemployed / looking for work, 4 = Homemaker / stay-at-home parent, 5 = Student, 6 = Retired, 7 = Other

- **Ethnicity (Prolific-simplified):** 0 = Asian, 1 = Black, 2 = Consent evoked, 3 = Mixed, 4 = Other, 5 = White

These encoding steps supported both exploratory and inferential analyses. In addition to ordinal encoding, one-hot encoding was applied to categorical variables to enable clustering procedures and subgroup comparisons.

3.8.4 Data Analysis Strategy

The analysis proceeded through four main stages:

1. **Descriptive Analysis**: Summary statistics and visualisations (histograms, boxplots) were used to describe distributions and check assumptions.
2. **Correlation Analysis**: Pearson correlation coefficients were calculated to explore relationships across domains (spatial perception, interaction, cohesion).
3. **Moderation Modelling**: OLS models with interaction terms tested moderation effects of perceptual and sociodemographic variables on IV-DV relationships.
4. **Mediation Modelling**: A four-step procedure was applied to test indirect effects through social interaction mediators, with 5,000 bootstrap resamples to estimate confidence intervals (Baron & Kenny, 1986; MacKinnom et al., 2012).

Separate models were run for city centre and residential neighbourhood contexts. All analyses were conducted in Python using Statsmodels and custom bootstrapping functions.

3.8.5 Construct Mapping

This section outlines the operationalisation of key variables including independent variables (IVs), moderators, mediators, and dependent variables (DVs), based on the conceptual framework. The focus here is on the theoretical and empirical rationale guiding construct selection.

Our selection was driven by two core considerations. First, we prioritised constructs consistently identified in empirical studies of social cohesion in urban spaces, particularly those examining how individuals relate to public space through relational and affective processes. This includes foundational work on place attachment and

social affordances (Forrest & Kearns, 2001; J. Kim & Kaplan, 2004), as well as more recent contributions linking public space quality to social trust, safety, and inclusion in diverse urban settings (Wan et al., 2021; Wang & Liu, 2022; Wickes et al., 2019).

Second, each construct was explicitly aligned with the tripartite structure of the multi-lens framework (Chapter 2), which differentiates between spatial–behavioural conditions, social-ecological processes, and psychosocial outcomes. This ensures conceptual clarity and analytical distinctiveness across the modelling strategy. This structure enables a systematic investigation of how design, interaction, and perception jointly shape social cohesion in public space.

We identified three conceptual domains:

- **Spatial Perception**: Encompasses respondents' evaluations of quality of physical characteristics of public space, capturing perceived affordances for interaction and presence. These were adapted from instruments used in urban design perception studies (Mehta, 2014; Talen, 2000).
- **Social Interaction (Behavioural Outcomes**: Refers to the frequency and typology of public space encounters, including passive interaction, fleeting interaction, and enduring exchanges. These typologies draw on frameworks from Whyte Whyte (1980), Gehl (2011), and Mehta (2019b), as well as the categorisations used in the behavioural mapping study.
- **Social Cohesion (Perceptual Outcomes)**: Includes five distinct psychosocial outcomes *sense of community*, *sense of belonging*, *social capital trust*, *social inclusion*, and *place attachment*. Item design followed empirical precedent in environmental psychology and urban sociology (Scannell & Gifford, 2010; Schiefer & van der Noll, 2017), in terms of capturing the core experiential and relational dimensions of cohesion while maintaining contextual relevance to public space.

Table 3.6 presents the mapping of core constructs to their respective survey items. The constructs employed in this chapter were informed by, but not identical to, those synthesised in the systematic review of urban public space and social cohesion (Qi et al., 2024). While the systematic review (Chapter 4) atalogued a wide range of physical, social, and perceptual variables, the present survey design prioritised constructs that could be reliably self-reported and that aligned with the psychosocial focus of this chapter. Specifically, constructs were selected to reflect the three core dimensions of the multi-lens framework, spatial perception, social interaction, and cohesion outcomes, drawing on established empirical research in environmental psychology and urban design (Peters & de Haan, 2011; Scannell & Gifford, 2010).

Table 3.6: Mapping of Analytical Constructs to Survey Questions

Construct	Survey Question (Verbatim)	Code	Context	Role in Model
Passive Sociability	The frequency of you enjoy being alone in the public space...	Q10 / Q18	CC / RN	Mediator / DV
Fleeting Sociability	The frequency of you stop for a chat or smile to an acquaintance...	Q11 / Q19	CC / RN	Mediator / DV
Enduring Sociability	The frequency of you spending time with friends and family...	Q12 / Q20	CC / RN	Mediator / DV
Landmarks & Place Identity	Recognisable establishments (historic buildings, signs...)	Q5 / Q13	CC / RN	IV
Pedestrian Design Affordances	Pedestrian comfort, articulation, street furniture	Q6 / Q14	CC / RN	IV
Active Frontages	Occupied storefronts, open corners	Q7 / Q15	CC / RN	IV
Mixed Use Integration	Variety of uses: shops, offices, apartments	Q8 / Q16	CC / RN	IV
Spatial Maintenance & Safety	Secure, tidy, streetlights, bins, low graffiti	Q9 / Q17	CC / RN	IV
Perceived Comfort	Comfort (temperature, sound, visual) affects use	Q21	General	Moderator
Perceived Safety	Safety perception affects use of space	Q22	General	Moderator
Perceived Familiarity	Familiarity/attachment affects use	Q23	General	Moderator
Sense of Belonging	Inclusiveness, social connection affects use	Q24	General	Moderator
Social Network	Expanded social network from public space use	Q25	General	DV
Social Inclusion	Fostered inclusion, integration across groups	Q26	General	DV
Place Attachment	Emotional attachment to public space	Q27	General	DV
Sense of Community	Developed community/belonging over time	Q28	General	DV
Social Capital / Trust	Confidence in kindness/trustworthiness	Q29	General	DV

Survey items were phrased in accessible language to ensure respondent clarity, while construct labels maintain theoretical fidelity and analytical transparency. Unlike the Behavioural Mapping study (Chapter 6), which inferred spatial dynamics through observed user group presence and a segmentation of public space based on environmental typologies, this chapter captures how individuals perceive and interpret their social-spatial environments. Together, this complementary approach enables a more holistic investigation of the conditions under which cohesion is fostered or fractured in everyday urban life.

Each construct serves a distinct role in the analytical model, supporting the moderation and mediation analyses in Sections 7.3 and 7.4. These models test how cohesion is shaped by spatial or demographic factors and the ways public space is perceived and socially navigated. Full item phrasings and response formats are available via Github[4].

In addition, the inclusion of perceptual moderators (e.g., familiarity, belonging) alongside cohesion outcomes (e.g., place attachment, sense of community) is an intentional design of the modelling framework. In environmental psychology, perceptions function as situational conditions that influence how spatial affordances are converted into social outcomes, while cohesion indicators represent the realised states of these processes (Lewicka, 2011; McMillan & Chavis, 1986). Their conceptual proximity is purposeful, enabling explicit examination of feedback effects:

[4]https://github.com/jieqi1214/psychosocial-analysis.git

heightened perceptions can strengthen cohesion outcomes, and greater cohesion can, in turn, reinforce perceptions over time (Scannell & Gifford, 2010). This bidirectional logic reflects the dynamic, transactional nature of person–environment relations, in which experience and social structure are mutually constitutive (Stokols et al., 1996). Collinearity diagnostics confirmed that these constructs are empirically distinct. This distinction is critical for both theory and practice: perceptions function as modifiable levers within design and policy interventions, while cohesion outcomes serve as performance benchmarks, supporting the validity of the moderation and mediation models. Modelling both within the same analytical system enables practitioners to monitor whether design changes work and the psychosocial conditions that determine for whom and under what circumstances they succeed (Sampson et al., 1997).

3.8.6 Moderation Model Specification

A moderator can be understood as a third variable that can change the direction and strength of the relationship between dependent and independent variables (James & Brett, 1984). The moderation analysis explored the relationship between the five physical characteristics of public space (*Landmarks & Place Identity, Pedestrian Design Affordances, Active Frontages, Mixed Use Integration, Spatial Maintenance & Safety*) and three forms of social interaction or five dimensions of social cohesion (*Passive Sociability, Fleeting Sociability, Enduring Sociability, Social Network, Social Inclusion, Place Attachment, Sense of Community, Social Capital or Trust*), in terms of the effects of nine sociodemographic and perceptual factors (*Age, Gender, Income Level, Employment Status, Ethnicity, Perception of Comfort, Perception of Safety, Perception of Familiarity, Perception of Belonging*) as moderators.

According to moderating effects theory, M is a moderating variable if the relationship between variables Y and X is a function of M, meaning that the relationship between Y and X is influenced by a third variable (James & Brett, 1984).

The moderating effect model is expressed as follows:

$$Y_{pms} = \alpha + \beta_0 X_P + \beta_1 M_m + \beta(X_P \times M_m) + \varepsilon \tag{3.1}$$

where Y_{pms} is the dependent variable (the outcome variable representing social interactions or social cohesion experiences); X_P is the independent variable (the physical characteristics of public space); M_m is the moderating variable (sociodemographic and perceptual factors); β_0 and β_1 are the coefficients for the independent and moderating variables, respectively; α is the intercept; $X_P \times M_m$ represents the interaction

term between the independent and moderating variables; and β captures the effect of this interaction term. Significance thresholds were set at $p < .05$ (two-tailed), with interaction terms interpreted using marginal effect plots to clarify the nature of moderation.

3.8.7 Mediation Model Specification

We tested whether social interactions mediate the relationship between public space characteristics and social cohesion using a four-step mediation framework (Baron & Kenny, 1986; MacKinnom et al., 2012; Zhao et al., 2010). Public space features (*Landmarks & Place Identity, Pedestrian Design Affordances, Active Frontages, Mixed Use Integration, Spatial Maintenance & Safety*) were modelled as independent variables (IVs), and social cohesion outcomes (*Social Network, Social Inclusion, Place Attachment, Sense of Community, Social Capital / Trust*) as dependent variables (DVs).

Mediators comprised three forms of sociability, *Passive*, *Fleeting*, and *Enduring*, operationalised as in the multi-conceptual framework (Chapter 2) and observed in the behaviour mapping study (Chapter 6). Their inclusion follows established evidence linking spatial form to social outcomes through interaction patterns (Mehta, 2009; Talen, 1999; Wan et al., 2021), ensuring both theoretical grounding and methodological transparency.

We tested all possible IV-mediator-DV triads (75 models) each urban context using ordinary least squares (OLS) regression with 5,000 bootstrapped resamples [5] to generate robust confidence intervals. This procedure allowed us to identify whether the mediators partially or fully explained the effect of physical characteristics on cohesion outcomes.

Stepwise Analytical Procedure

To assess how social interaction mediators carry the effects of public space features onto social cohesion outcomes, we implemented exactly the same four-step OLS procedure used in the Python pipeline [6]. We tested all 75 IV–Mediator–DV triads per urban context, using $N_{\text{BOOTSTRAPS}} = 5000$ and $\alpha = 0.05$.

[5]Bootstrapping was employed to estimate confidence intervals for indirect effects due to the known non-normal distribution of the product of coefficients (a × b) in mediation analysis. This resampling method provides bias-corrected confidence intervals that are more accurate than those derived from traditional parametric tests, particularly in smaller samples or when indirect effects are weak. This approach is widely recommended for mediation models involving complex or non-linear paths (MacKinnon et al., 2007; Preacher & Hayes, 2004).

[6]https://github.com/jieqi1214/psychosocial-analysis

Step One: Total Effect (c)

For each IV–DV pair, fit

$$Y = \beta_0 + c\,X + \varepsilon_1$$

via OLS. Record the coefficient c, its p-value p_c, and its bias-corrected bootstrap 95% CI. Retain only those triads with $p_c < 0.05$.

Step Two: IV–Mediator Effect (a)

For each retained IV–Mediator pair, fit

$$M = \beta_0 + a\,X + \varepsilon_2$$

via OLS. Record a, its p-value p_a, and its bootstrap 95% CI. Retain only those triads with $p_a < 0.05$.

Step Three: Mediator–DV Effect (b)

For each retained Mediator–DV pair, fit

$$Y = \beta_0 + b\,M + \varepsilon_3$$

via OLS. Record b, its p-value p_b, and its bootstrap 95% CI. Retain only those triads with $p_b < 0.05$.

Step Four: Joint Model, Direct Effect (c') and Indirect Effect ($a \times b'$)

On the subset where $p_c < 0.05$, $p_a < 0.05$, and $p_b < 0.05$, fit

$$Y = \beta_0 + c'\,X + b'\,M + \varepsilon_4$$

via OLS. Record c', its p-value $p_{c'}$, and its bootstrap 95% CI; record b' and its CI. Compute the point estimate of the indirect effect as

$$\widehat{ab} \;=\; a \times b'$$

and generate 5,000 bootstrap replications to derive its bias-corrected 95% CI. Classify mediation as:

- *Partial* (`p`): CI(ab) excludes zero and $p_{c'} < 0.05$.
- *Full* (`f`): CI(ab) excludes zero and $p_{c'} \geq 0.05$.

- *None*: CI(ab) includes zero[7].

We also computed for each triad:

- R_1^2, $\overline{R}_1^2$ from Step 1 model ($Y \sim X$).
- R_4^2, $\overline{R}_4^2$ from Step 4 joint model.
- $\Delta R^2 = R_4^2 - R_1^2$, and $\Delta \overline{R}^2 = \overline{R}_4^2 - \overline{R}_1^2$.

We report R_4^2 as the primary measure of explanatory power for the full mediation pathway. For transparency, we also computed R_1^2 and the incremental variance explained (indicating the incremental explanatory power due to the mediator), ΔR^2.

3.8.8 Ethical Considerations

A set of research protocol and the corresponding ethics concerns raised by the survey study are addressed as followed. Firstly, during the survey design process, the researcher followed the ethics protocols in terms of achieving confidentiality and anonymity (Oldendick, 2012) strictly in relation to assessing the feasibility of research questions and the format of survey structure. Secondly, ethics application approval was gained from the department's ethics committee (Appendix E). A copy of the survey, an information sheet and conformation consent of a clear account of the survey study were given to and signed by all participants to ensure the voluntary nature of all studies in terms of establishing consent, confidentiality, and anonymity ((Sim & Waterfield, 2019). Lastly, to mitigate the ethical challenges of online survey, ethical practices such as ensuring transparency while Prolific recruitment via including clear introduction of the project, considering participants' expectations about privacy by obtaining informed and knowledgeable consent, using secure communication protocols through offering participants the opportunity to withdraw from the research and retract their data, and ensuring that data are not used for subsequent non-research purposes (Gupta, 2017).

3.9 Phase Five: Focus Group Study

The final phase of this research employed a focus group study to directly engage with diverse public space users and communities. This method enabled in-depth exploration of both the barriers and facilitators of social interaction and cohesion in

[7]In statistical mediation analysis, full mediation is typically inferred when the direct effect (c') becomes non-significant ($p > 0.05$) after including the mediator, indicating that the IV affects the DV only indirectly through the mediator (Baron & Kenny, 1986). The 0.05 threshold reflects the conventional standard for statistical significance in the social and behavioural sciences, denoting less than a 5% probability of observing the effect if the null hypothesis were true.

urban environments, grounded in participants' lived experiences in Sheffield and/or other urban contexts.

Focus groups were selected due to their methodological flexibility and ability to reveal multiple viewpoints and rich data through moderated interaction. They are particularly effective in surfacing complex experiences, perceptions, and attitudes through group dynamics (Nyumba et al., 2018). This method supported the investigation of how implicit social norms and orders shape everyday public space use (Jurkovič, 2014).

The focus group data can enrich our understanding of how social interactions and social cohesion, encompassing constructs such as sense of community, inclusion, integration, and place attachment, unfold in real-world urban settings, as experienced by diverse public space users (Bateman et al., 2021; Jurkovič, 2014). The data generated allowed the researcher to contextualise and explain observed behaviour patterns from the Behaviour Mapping study, such as the high prevalence of social interaction among Southeast Asian users in Botanical Gardens during summer; and to unpack patterns identified in the Survey Study, such as the decline in perceived community cohesion in residential neighbourhoods following improvements to physical features (e.g., signage, active frontage, infrastructure). These narratives provided insight into how user profiles and place perceptions mediate the experience of social cohesion in city centre versus neighbourhood settings.

3.9.1 Sampling Strategy

A combination of convenience and purposive sampling techniques was used. Convenience sampling helped identify prospective participants from the researcher's extended networks, including university contacts, gym users, and local shop patrons. These individuals were familiar with the public spaces observed in earlier research phases and had contextual experience relevant to survey constructs.

Purposive sampling ensured participants had first-hand experiences with public space social interactions and cohesion. A snowball approach was also employed: initial participants were invited to name others with similar experiences, particularly those who had used public spaces such as the Botanical Gardens, Peace Gardens, Ecclesall Road, Division Street, and Western Bank Park. All named individuals were evaluated against inclusion criteria before formal invitation. These criteria ensured participants had relevant lived experience with urban public spaces. To capture a broad range of perspectives, recruitment was refined to balance sociodemographic variation, specifically across gender, age, ethnicity, and employment status, supporting triangulation across prior empirical phases (Seamon & Gill, 2016).

3.9.2 Study Design and Data Collection

A 90-minute focus group session was held in a university meeting room in late October 2024, involving thirteen participants. Recruitment included outreach through the university gym to ensure diversity in gender, age, ethnicity, and employment status. To provide transparency and contextualise the focus group findings, Table 3.7 summarises the sociodemographic composition of the 13 participants. While the sample was not intended to be statistically representative, it was purposively structured to capture a diverse cross-section of age, gender, ethnicity, and employment status, aligning with the exploratory and interpretive aims of this qualitative phase while preserving participant anonymity.

Table 3.7: Summary of Focus Group Participant Demographics (N = 13)

Attribute	**Distribution**
Gender	5 Female, 8 Male
Age Group	3 (18–29), 5 (30–44), 3 (45–64), 2 (65+)
Ethnicity	5 White, 3 Asian, 3 Southeast Asian, 1 Black, 1 Other
Employment Status	4 Full-time, 1 Part-time, 4 Students, 3 Retired, 1 Unemployed
Residential Type (Urban Environment)	8 Residential Neighbourhood, 5 City Centre

Participants received a pre-circulated information pack comprising:

- An information sheet and consent form;
- A focus group agenda and guiding questions (see Appendix E);

These documents ensured ethical compliance and helped structure discussion around key research questions without introducing bias or undue influence.

The session was audio-recorded using a digital Dictaphone, and researcher notes were taken throughout. Audio files were securely transferred to an encrypted university computer and external hard drive. Transcription was performed using Microsoft Word, with accuracy validated by simultaneous playback and reading. All data handling followed the university's approved ethics protocol (see Appendix E).

3.9.3 Data Analysis Approach

We adopted a reflexive thematic analysis, following the six-phase process of Braun and Clarke (2006), to examine how participants understand, experience, and negotiate social interaction and cohesion in public spaces. This method is well suited for this research aim because it captures the socially constructed meanings of place

and interaction that are not accessible through behavioural mapping or survey modelling alone. Thematic analysis accommodates both inductive coding of emergent patterns and deductive structuring informed by the multi-lens framework (Chapter 2), enabling us to interpret focus group narratives through spatial-behavioural, social-ecological, and psychosocial lenses.

3.9.4 Coding Procedure

We began by familiarising theselves with the transcripts through repeated close readings, noting recurring meanings, contextual details, and points of resonance or contrast with findings from Chapters 6 and 7. Initial codes were generated manually, reflecting both participant language and latent meanings. These codes were refined iteratively into a structured codebook, tested across the dataset, and then clustered into candidate sub-themes and themes. In line with iterative qualitative analysis practices in urban space research (Davies, Laing, et al., 2002; Johansson et al., 2012; Jurkovič, 2014), we reviewed themes for both internal coherence (consistency among coded extracts) and conceptual distinctiveness (clear differentiation from other themes). This process ensured that each theme represented a recurring, patterned meaning directly relevant to the research question, rather than an isolated or anecdotal observation. Table 3.8 illustrates the progression from raw participant statements to interpretive themes.

Furthermore, to support analytic transparency and ensure conceptual rigour, a structured codebook was developed to guide thematic analysis. This codebook was derived through iterative cycles of open, axial, and selective coding, in line with grounded theory-informed approaches (Braun & Clarke, 2006; Urquhart, 2022). Initial open coding surfaced key experiential motifs across transcripts, which were then refined into a system of interlinked themes and sub-themes through constant comparison and memo-writing. The resulting structure captured different interpretive logics, such as how participants constructed meaning around public space through recurring references to safety, familiarity, and rhythm. Table 3.9 presents the final codebook, which comprises five overarching themes and their corresponding sub-themes. Each theme reflects a distinct but interdependent mechanism through which social cohesion is experienced, contested, or disrupted in public space. The codebook thus served as both an analytic scaffold and a conceptual map, allowing the research to systematically trace how individual experiences were patterned, situated, and socially constructed across focus group narratives.

Table 3.8: Example of coding progression from raw data to theme

Raw Quote (excerpt)	**Initial Code**	**Sub-theme**	**Theme**
"...there's a screaming child... you get the antisocial where people sitting on a corner being malicious..."	Contested space use driven by relational conditions and antisocial behaviour	Negotiated use; relational conditions; antisocial presence Perception of safety	Negotiated safety and comfort
"...all the houses look the same... not necessarily say hi, but see that guy frequently"	Absence of casual encounters; weak sense of community	Perception of belonging and social connectedness	Physical design affordance as preconditions
"Peace Garden... more of a shortcut... in summer, events like food festival"	Seasonal and proximity-driven public space use	Optional activity; seasonal impact	Temporal and spatial modulation of cohesion
"...on the outskirts... fewer things around, so drove instead; now more central, I walk more"	Mixed use and pedestrian affordance affect mobility and interaction	Proximity; mixed use integration; walkability	Physical design affordance as preconditions
"...large pots to change roads for school... uproar from neighbours"	Resistance to interventions when baseline comfort and belonging are already high	Reduced use and attachment after change when perception of comfort already high	Belonging, attachment, and the negotiation of change
"...Peace Gardens is diverse... Western Park less so... last time it was cold, fewer people"	Seasonal and locational variation in co-presence	Demographic diversity; seasonal variation	Temporal and spatial modulation of cohesion

3.9.5 Validity and Reliability

To enhance analytic transparency and guard against interpretive bias, we maintained a reflexive journal throughout the coding process. This documented the coding decisions, emerging interpretations, and points of uncertainty, acknowledging how the positionality and disciplinary perspectives may have shaped interpretation (R. Berger, 2015). Coding proceeded through multiple cycles, with peer review of the codebook by a second researcher to test for clarity and challenge assumptions[8]. Themes were retained when they met the saturation criterion: recurrence across at least half the participant group and explanatory relevance to the research question (Braun & Clarke, 2006).

[8]All coding and theme development were conducted solely by the author. The peer review process was limited to providing feedback on the clarity of code definitions and their alignment with the research aims, without altering the substantive analytical decisions.

Table 3.9: Codebook of Themes and Sub-Themes Derived from Focus Group Analysis

Main Theme	Sub-Themes / Mechanisms	Description / Interpretation
Physical Design Affordance as Preconditions	Invitation to Stay	Participants evaluated features like benches, greening, and openness as cues for whether space was welcoming or exclusionary.
	Symbolic Accessibility	Design was interpreted not just functionally but symbolically—for example, some benches were perceived as reserved for certain groups.
Normative Structures and Informal Regulation	Scripts of Use	Informal expectations shaped social acceptability (e.g., no loitering, quiet behaviour), regulating interactions without formal enforcement.
	Group Boundaries	Implicit understandings of who belongs, and under what conditions, influenced inclusion and exclusion in everyday practice.
Belonging, Attachment, and the Negotiation of Change	Familiarity and Recognition	Belonging was grounded in sensory cues and routine, such as seeing familiar faces or hearing familiar languages.
	Resistance to Change	Participants expressed discomfort when spatial or policy interventions disrupted established social or emotional ties to place.
Negotiated Safety and Comfort	Risk Cues	Safety was judged dynamically through environmental cues (lighting, surveillance) and crowd composition.
	Time-Dependent Perceptions	Spaces were described as safe or unsafe depending on time of day or user density, not just design.
Temporal and Spatial Modulation of Cohesion	Predictable Rhythms	Use of public space was shaped by habitual cycles (e.g., school runs, prayer times, seasonal events).
	Rhythm Disruption	Interventions or events that disrupted expected rhythms often triggered discomfort, avoidance, or renegotiation of space use.

3.9.6 Integration with Other Methods

Our thematic analysis was applied to further explain and triangulate with the quantitative analyses in Chapters 6 and 7. Where behavioural mapping identified patterns

of marginalisation, co-presence, or demographic clustering, we examined focus group narratives to uncover the perceived mechanisms, such as safety concerns, identity cues, or local social norms, that might explain these spatial distributions. Likewise, where survey moderation models showed that the effect of a spatial feature varied by perceptual factors or demographic group, we explored qualitative accounts to understand why those differences arose. This triangulation allowed us to identify convergences and divergences between observed patterns, modelled relationships, and lived interpretations (Creswell & Clark, 2017).

By embedding focus group analysis within this mixed-methods architecture, we ensure that the qualitative findings extend, rather than duplicate, prior literature (e.g., Amin (2008), Cattell et al. (2008b), Dines et al. (2006a), and Mehta (2009)) and that they make a distinctive contribution by connecting lived meanings directly to the behavioural and statistical patterns identified earlier in this research.

3.9.7 Ethical Considerations

This focus group study aimed to explore and explain the complex relationship between urban public space and social cohesion through the lens of citizens' and communities' social experiences in everyday urban environments. As such, a number of ethical challenges required careful consideration prior to and throughout the research process (Sim & Waterfield, 2019).

Firstly, ethics approval was obtained from the department's ethics committee. As part of the application process, a thorough evaluation of potential harms to participants was conducted, and appropriate strategies were identified to mitigate physical and emotional risks to both participants and the researcher. Each participant was provided with a focus group meeting agenda, discussion questions, an information sheet, and a consent form outlining the study's aims, procedures, and rights of withdrawal. All participants signed the consent form prior to participation to ensure voluntary involvement, confidentiality, and anonymity.

Secondly, all interactions between the researcher and participants adhered strictly to the ethical protocols approved in the application (Appendix E). These included providing a clear explanation of the study's purpose and procedures, as well as distributing the relevant documentation (information sheet, consent form, and meeting agenda) prior to any data collection activities.

Finally, ethical considerations specific to focus group methodology, such as informed disclosure and revocable consent, confidentiality and anonymity within a group setting, and the potential risk of harm, were addressed and managed throughout the study (Sim & Waterfield, 2019). While focus groups offer a cost-effective and effi-

cient approach to data collection, they demand careful preparation and planning. This process ensures ethical practice and honours participants' autonomy and rights. In doing so, the study aligns with principles of participatory action research, supporting both the empowerment of participants and the potential for positive social change.

Chapter 4

Systematic Literature Review

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4.1 Introduction

This chapter presents the findings of a systematic literature review (SLR) of research on public space and social cohesion, published as Qi et al. (2024). The purpose of this review was to address Research Question 1: *What conceptual, empirical, and policy gaps exist in understanding how public space influences social cohesion, and how can these inform a cross-method empirical agenda?*

As outlined in Chapter 2, cohesion is understood here across three complementary domains, perceptual, interactional, and group-based, that extend beyond static or attitudinal framings to emphasise process, fluidity, and context. Chapter 3 set out the protocol used to conduct the review, including search strategy, inclusion criteria, and coding framework. The focus of this chapter is therefore on the substantive patterns and gaps revealed by the review, and their implications for subsequent empirical design.

The SLR contributes to the thesis in three distinct ways. First, it consolidates the state of knowledge, synthesising empirical evidence on the relationship between public space, social interaction, and cohesion outcomes. Second, it identifies key conditioning factors, including spatial, temporal, sociodemographic, and perceptual, that mediate this relationship, pointing to the need for situational and contextual thinking. Finally, it reveals critical conceptual and methodological gaps in the field, which informed the multi-method, cross-context approach adopted in later chapters.

4.2 Overview of Reviewed Studies

The review identified **63 studies**, published between 2000 and 2023, spanning disciplines including urban design, environmental psychology, planning, sociology, and public health. A full list of the studies included in the review, with details of methods, samples, typologies, outcomes, and analytical techniques, is provided in Appendix F. Studies were geographically diverse, though heavily concentrated in Europe, North America, and East Asia, with relatively fewer contributions from the Global South. Most employed cross-sectional survey or observational designs, with fewer longitudinal, experimental, or mixed-method approaches. Comparatively little work systematically linked design features to psychosocial outcomes, and even fewer attempted to integrate perceptual and interactional dimensions. Table 4.1 summarises the scope of the reviewed literature, while Figure 4.1 illustrates the geographical distribution of studies.

Across this corpus, three tendencies stood out. Public space was often treated in functional or morphological terms, with less attention to its symbolic or relational

Table 4.1: Scope of reviewed studies in the SLR.

Dimension	**Summary**
Timeframe	2000–2023
Number of studies	63
Geographical coverage	Europe (32 %), North America (13%), Asia (43%), Oceania (9%), Africa (3%)
Methodologies	Predominantly cross-sectional survey and observational; limited longitudinal and mixed-method studies
Key disciplinary fields	Urban design, planning, sociology, environmental psychology, public health
Research foci	Spatial and physical attributes, social interactions, psychosocial perceptions, and cohesion outcomes

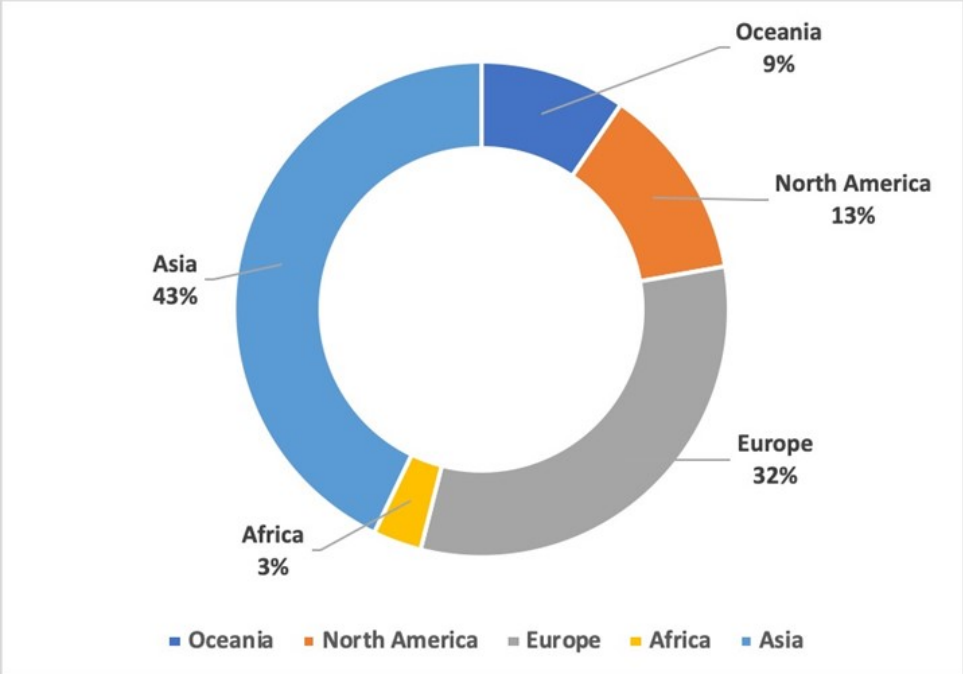

Figure 4.1: Geographical distribution of reviewed studies.

dimensions. Secondly, social cohesion was conceptualised inconsistently, frequently conflated with related constructs such as trust, inclusion, or social capital, and rarely operationalised across multiple domains. Finally, while many studies acknowledged conditional factors such as safety, belonging, or demographic composition, these were often treated as background variables rather than central explanatory mechanisms. Together, these tendencies highlights both the richness and the fragmentation of the field, and provide the foundation for the thematic synthesis presented in the following sections.

4.3 Findings and Implications

4.3.1 What kinds of public spaces have been studied in relation to social cohesion

Figure 4.2 summarises the main types of public space examined in the SLR. Broadly, studies cluster around two contexts: *city centres*, where public space is linked to civic identity, cultural life, and inclusivity, and *residential neighbourhoods*, where public space anchors everyday encounters, routines, and local belonging. Across both, positive effects are most evident when physical attributes maximise place value across diverse socio-economic groups (Carmona, 2019a).

City Centre Settings

Research highlights the contribution of central public spaces to urban identity and shared culture (Askarizad & Safari, 2020; Ghahremani et al., 2021; Lara-Hernandez et al., 2019; Lotfata & Ataöv, 2020; Mateo-Babiano, 2012; Purwanto & Harani, 2020). Three typologies dominate:

- **Urban streets**: Historical and commercial streets support interaction between pedestrians, vendors, and residents, embedding shared socio-cultural values and continuity of urban life (Lotfata & Ataöv, 2020; Mateo-Babiano, 2012).
- **Pedestrian zones**: Car-free areas strengthen place attachment and belonging by accommodating diverse social and emotional needs. Informal adaptations, such as underpasses, illustrate how norms of use and inclusivity are negotiated (H. Nguyen, 2019; Sattarzadeh, 2018).
- **Public squares and commercial services**: Plazas and third places foster integration across ethnic groups (Aelbrecht, 2016; McClimens et al., 2012). Food shops and cafés enhance conviviality and everyday encounters, while commercial hubs attract and sustain public presence (T. V. Nguyen et al., 2019; Zordan et al., 2019).

Residential Neighbourhood Settings

Neighbourhood spaces play a central role in local cohesion, supporting both weak ties and everyday solidarity (Cattell et al., 2008b; P. Hickman, 2013; Liu et al., 2020; Salvadó et al., 2020; Watson, 2009; Wickes et al., 2019).

- **Local facilities and open space**: Markets, green spaces, and sports centres nurture daily routines and community ties. Evidence is mixed: some studies

link cohesion to physical quality (Francis et al., 2012), while others stress actual use and social mixing (Liu et al., 2020; Zhu & Fu, 2017).

- **Fourth places**: Informal gathering points (e.g., cafés, streets, semi-public areas) foster co-presence, spontaneous encounters, and inclusivity (Can & Heath, 2016). They enhance equity, social capital, civic engagement, and stability by bridging inter- and intra-generational groups (Abed & Al-Jokhadar, 2021; Zerouati & Bellal, 2019; Y. Zhang & Dimitrijevic, 2025).

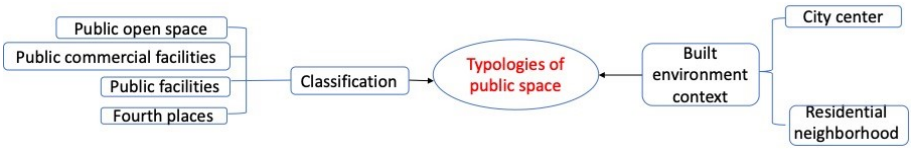

Figure 4.2: Typologies of public spaces studied in relation to social cohesion.

In conclusion, city centre spaces primarily contribute to cohesion through civic identity and diversity of encounters, whereas neighbourhood spaces underpin everyday belonging, attachment, and continuity. Together, they illustrate that cohesion is contingent on both spatial form and the lived practices that animate it.

4.3.2 What physical aspects of public space promote social cohesion?

Studies consistently link the *quality features* of public space to opportunities for encounter, interaction, and attachment. These attributes operate both at the level of individual places (e.g., a street, square, or park) and across larger sites or networks of spaces. Together, they show how physical form intersects with social practice to shape cohesion in contemporary urban environments (Aelbrecht, 2016; Flint & Kearns, 2007). Figure 4.3 illustrates the main aspects identified.

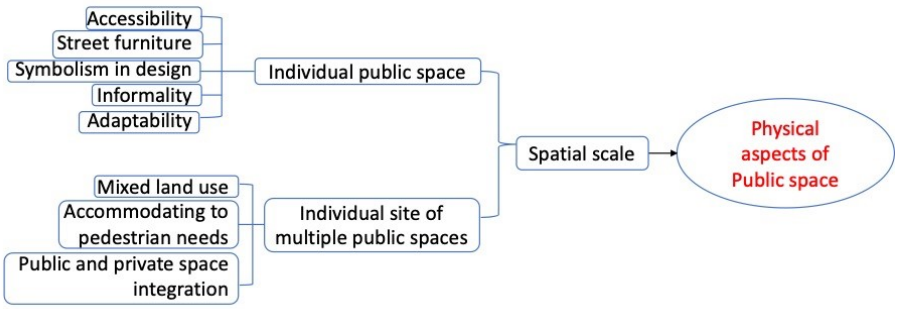

Figure 4.3: Physical aspects of public space studied in relation to cohesion, across different spatial scales.

Physical Attributes of Individual Spaces

- **Accessibility**: A precondition for co-presence and inclusion, particularly for marginalised groups such as people with disabilities, migrants, or residents with low socioeconomic status (Bredewold et al., 2020; Ganji & Rishbeth, 2020; H. Nguyen, 2019; Trawalter et al., 2021). Accessible spaces allow diverse users to participate in public life and sustain interaction (Gans, 2002; Jenson, 1998; Khemri et al., 2020).
- **Street furniture and amenities**: Benches, lighting, fountains, or signage support lingering, people-watching, and casual contact, while shaping patterns of integration or segregation (Askarizad et al., 2024; Ujang & Zakariya, 2015). These elements create convivial environments that encourage place attachment.
- **Symbolism and heritage**: Landmarks, memorials, and culturally embedded practices (e.g., vending, festivals) convey identity and continuity, anchoring attachment and enabling shared meaning (Ghahremani et al., 2021; Mateo-Babiano, 2012; Mcmillan & Chavis, 2019). Symbolic recognition strengthens belonging and fosters trust across groups.
- **Informality and adaptability**: Flexible spaces with porous boundaries and capacity for informal uses (e.g., gatherings, vending) encourage unexpected encounters, inclusivity, and openness (Mateo-Babiano, 2012; Zordan et al., 2019). These affordances form part of a contemporary "public culture of spontaneity" that builds social capital and attachment (Amin, 2006a).

Physical Attributes of Public Space Sites

- **Mixed land use**: Co-location of recreational, commercial, and civic spaces multiplies opportunities for participation, creating affordances for leisure, trade, and sociability (Lotfata & Ataöv, 2020; Mehta, 2019b; Zordan et al., 2019).
- **Pedestrian-oriented design**: Rich ground-floor features and walkable layouts (e.g., active edges, articulated façades) stimulate contact, enhance liveliness, and generate sense of place (Dines et al., 2006a; Lara-Hernandez et al., 2019; Talen, 2000).
- **Integration with private realms**: Proximity and adjacency between homes, facilities, and public space extend networks of overlapping activity, supporting casual encounters and neighbourhood cohesion (Liu et al., 2020; Soares et al., 2020; Wickes et al., 2019).

Taken together, physical features matter both as material provisions and as enablers

of social life. Accessibility, symbolic design, and adaptive affordances condition how inclusive and convivial a space becomes, while land-use mix, pedestrian orientation, and integration across scales determine how cohesion is embedded in everyday routines.

4.3.3 What conditioning factors affect the relationship between public space and social cohesion?

The relationship between public space and cohesion is not uniform but mediated by *conditioning factors*. These include both *sociodemographic characteristics* (e.g., age, gender, ethnicity) and *perceptions* (e.g., safety, accessibility, comfort), which shape how spaces are used, interpreted, and valued (Bredewold et al., 2020; Salimi et al., 2019; Talen, 2000). Figure 4.4 summarises these dimensions.

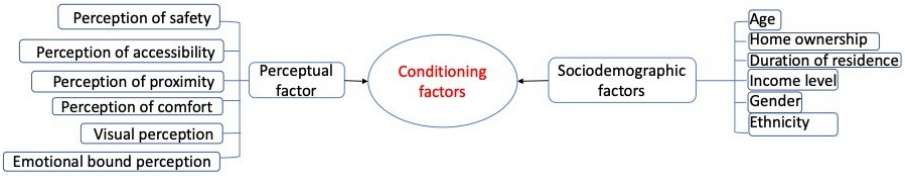

Figure 4.4: Conditioning factors influencing the relationship between public space and social cohesion.

Sociodemographic Factors

- **Age and life stage**: Older adults often prioritise environmental quality (greenery, amenities) in seeking solidarity, while younger groups emphasise proximity, interaction, and opportunities for bridging ties (Dash & Thilagam, 2022; Mantey, 2015). Life stage, such as presence of children, also influences perceived needs and engagements (Frech & Kimbro, 2011).
- **Home ownership and residence length**: These factors are strongly associated with community participation, attachment, and social capital, reflecting investment in local networks (Francis et al., 2012; Zhu & Fu, 2017).
- **Income and socio-economic status**: Economic status affects both access to and experience of public space. In deprived areas, local cafés or streets can act as critical hubs of social life (P. Hickman, 2013; Ujang et al., 2018), while in university or city-centre contexts, socioeconomic status influences belonging and participation (Trawalter et al., 2021).
- **Gender**: Women's presence and practices (e.g., childcare, gardening, community events) are often central to neighbourhood cohesion, though shaped by

cultural and socio-political constraints (Khalilin & Fallah, 2018; S. M. Low, 2000; Modie-Moroka et al., 2020; C. Ortiz et al., 2025).

- **Ethnicity and migration**: Ethnically diverse spaces can foster awareness, tolerance, and conviviality (Cattell et al., 2008a; Peters & de Haan, 2011), but evidence is mixed. Some studies highlight self-segregation and limited out-group contact, cautioning against simplistic assumptions of interaction leading to integration (Priest et al., 2014; Wang & Liu, 2022).

Perceptual Factors

- **Safety**: Perceived safety correlates with interaction, trust, and social capital (Alipour & Ahmed, 2021; Bjornstrom & Ralston, 2014; Oidjarv, 2018). Busy, diverse spaces often create a sense of natural surveillance, strengthening cohesion (Watson, 2009).

- **Accessibility and proximity**: Subjective perceptions of accessibility are often stronger predictors of engagement than objective measures. Perceived proximity to shops, parks, or services increases participation and sense of community, especially for older or lower-income residents (Levasseur et al., 2011; Pot et al., 2021).

- **Comfort and microclimate**: Thermal comfort and environmental satisfaction enhance optional and social activities (e.g., lingering, conversation), reinforcing attachment and use (Peng et al., 2019; Thorsson et al., 2007; Zabetian & Kheyroddin, 2019).

- **Visual qualities**: Aesthetics, legibility, and natural elements shape intensity of use and identity, with authentic, polyfunctional environments supporting stronger place-based ties (Bada, 2012; Perovic & Folic, 2012).

- **Emotional bonds and attachment**: Place attachment links perceptions of safety, belonging, and participation (Dallago et al., 2009; J. Kim & Kaplan, 2004). Attachment is bi-directional: it fosters engagement while being reinforced by social ties and functional dependence on place (Ujang, 2012).

Taken together, these findings underline that cohesion is contingent on who uses space and how they perceive it. Sociodemographic characteristics filter opportunities for inclusion or exclusion, while perceptual evaluations moderate whether physical affordances translate into attachment, trust, or participation. Ignoring these conditioning factors risks overestimating the integrative potential of design alone.

4.3.4 How has social interaction in public spaces been reported to facilitate social cohesion?

A central theme in the literature is that social cohesion in urban settings emerges through the everyday interactions and co-presence of people in public spaces (Mehta, 2019b). Research has classified interaction types in several ways, each emphasising different dimensions of urban life and offering insight into how sociability translates into belonging, trust, and inclusion. Figure 4.5 summarises the main typologies and characteristics identified.

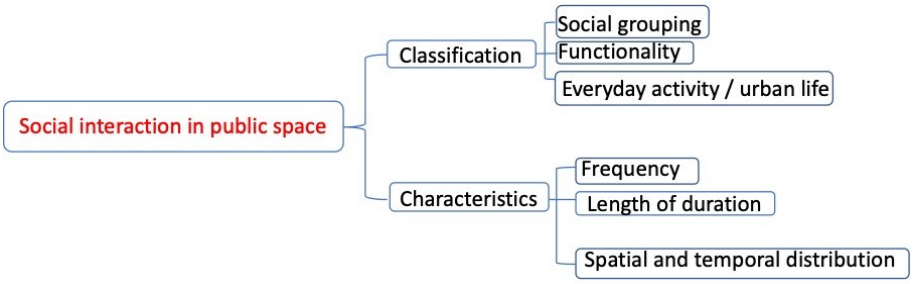

Figure 4.5: Typologies and characteristics of social interactions in public space.

Typologies of Social Interaction

- **Social grouping**: Studies examine how group types (e.g., couples, families, individuals) and demographic diversity structure experiences of cohesion. Patterns of grouping reveal how intercultural encounters unfold and how everyday conviviality is sustained (Cao & Kang, 2019; Ganji & Rishbeth, 2020; Schiefer & van der Noll, 2017).

- **Functionality**: Other approaches link interaction to the functional role of space, e.g., neighbourhood streets, markets, or civic squares. Interactions in these settings have been tied to outcomes such as sense of community, belonging, and inclusion (Francis et al., 2012; Liu et al., 2020; Salvadó et al., 2020).

- **Everyday activity**: Building on traditions in urban sociology (Jacobs, 1961; Whyte, 1980), scholars highlight mundane activities, i.e., walking, pausing, people-watching, as the building blocks of cohesion. Classifications include Gehl (2007)'s necessary, optional, and social activities, or Can and Heath (2015)'s distinctions between movement, stationary, and group interactions. These frameworks reflect how ordinary rhythms of urban life support conviviality and community building (W. Zhang & Lawson, 2009).

Characteristics of Interaction Patterns

- **Frequency**: Repeated encounters in local spaces build weak ties and reinforce belonging. Routine use of community venues and markets fosters social capital, particularly among older adults and women (Abed & Al-Jokhadar, 2021; . R. Yu et al., 2019). Typologies such as Wickes et al.'s (2019) "social conduits" capture how regularity sustains neighbourhood cohesion.
- **Length of engagement**: Longer stays increase opportunities for integration and attachment. Duration of contact (e.g., walking, lingering, conversation) is positively associated with satisfaction, wellbeing, and social ties (H. Kim & Yang, 2017; Mehta & Bosson, 2021; Watson, 2009).
- **Spatial and temporal distribution**: Interaction patterns vary by location and time, shaping the inclusivity of space. Observational studies show how "in-between" spaces such as thresholds or underpasses host informal encounters among strangers, while busy sites foster intergroup contact (Abed & Al-Jokhadar, 2021; Amran & Fuad, 2020). Such distributions reveal how cohesion depends on both form and rhythm of use.

Therefore, typologies of interaction highlight different logics. including demographic, functional, or everyday life, while the characteristics of frequency, duration, and distribution explain how cohesion is enacted in practice. Together, these approaches demonstrate that social cohesion in public space is less about formal provision than about the situated, repeated, and embodied practices of urban life.

4.4 Discussion and Conclusions

4.4.1 Inconsistency in Assessed Outcomes

Social cohesion remains a multidimensional construct with no consensus on conceptualisation or measurement (Schiefer & van der Noll, 2017). This review shows that studies operationalise cohesion through diverse outcomes, including social inclusion, social relations (social network), place attachment, sense of community, and social cohesion (social capital), yet rarely provide clear definitions or consistent indicators (Appendix F). Figure 4.6 summarises these variations.

The lack of standardisation hampers comparability across contexts and limits the development of robust indicators for monitoring cohesion longitudinally. For instance, Sattarzadeh (2018) assessed place attachment via ambient, social, and demographic factors, while Karsono et al. (2021) used familiarity and engagement length. Studies on social relations span from distance-based measures (Cao & Kang, 2019) to

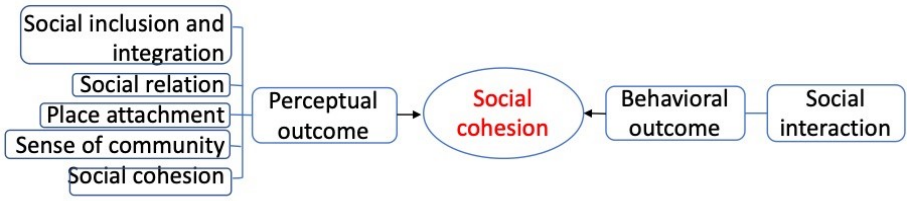

Figure 4.6: Assessed outcomes in the reviewed studies representing social cohesion.

more abstract accounts of daily sustenance and tolerance (Cattell et al., 2008b). Such heterogeneity reflects the richness of lived experiences but complicates synthesis. Indicators may even conflict: extensive networks do not always translate into sociability (Dempsey, 2008), and desires for community can clash with ideals of inter-ethnic integration (Dines et al., 2006a). Future work must better integrate perceptual, interactional, and group-based outcomes into coherent frameworks.

4.4.2 Divergent research foci

Although sharing the goal of linking public space with cohesion, studies diverge in disciplinary focus and methodological emphasis. Urban design, planning, and public health research often prioritises physical attributes and their effects on interaction, employing methods such as behavioural mapping, site analysis, or GIS. In contrast, sociology, geography, and community psychology frequently use ethnography, interviews, and observation to foreground meanings, but without systematically addressing spatial form. Appendix F shows fewer than half of studies conduct site analysis, and most concentrate on a single location and time-point. This disciplinary siloing produces fragmented insights and limits scalability. As Baker (2006) notes, ethnographic depth comes at the expense of generalisation, while spatial analyses often lack interpretive nuance. Emerging citizen science and digital approaches (Mazumdar et al., 2018) could bridge this gap by enabling broader observational coverage while retaining contextual sensitivity.

4.4.3 Conceptualising the Relationship

Despite growing interest across disciplines, conceptual models explaining how public space shapes cohesion remain underdeveloped. Environmental psychology has advanced place-based frameworks, such as Scannell and Gifford (2010) tripartite model (person–place–process), adopted in several studies of attachment and identity (Karsono et al., 2021; Mantey, 2015; Purwanto & Harani, 2020). Socio-ecological perspectives draw on classic models of person–environment interaction (Francis et al., 2012; H. Kim & Yang, 2017), while Wan et al. (2021) proposed a dual mechanism linking greenspace to cohesion via perception and use. Yet few frameworks explicitly

integrate socio-demographic or psychological moderators, such as ethnicity, gender, or perceived safety, even though these shape whether physical affordances translate into social outcomes. The absence of cross-domain integration risks circularity: spaces are labelled *"cohesive"* where interaction is observed, without accounting for underlying conditioning factors.

From a social–ecological perspective, this gap signals a deeper limitation in how cohesion is conceptualised in public space research. Cohesion is often reduced to observable encounters or subjective reports, but its emergence depends on multi-scalar processes where spatial form, ecological rhythms, and social structure interact. As Wu and colleagues argue in urban ecology, understanding complex systems requires attention to both pattern and process, across temporal and spatial scales (X. Guo et al., 2022; F. Wu, 2000; J. Wu, 1999). Applying this logic, public space functions as a dynamic socio–ecological system in which *demographic composition* (the age, gender, and ethnic mix present in a space), *institutional regulation* (formal governance and informal norms shaping what behaviours are permitted or discouraged), and *perceptual cues* (subjective readings of safety, comfort, or belonging) modulate the pathways through which design features foster or constrain social outcomes. Without recognising these layers, analyses risk remaining fragmented, overlooking the systemic conditions that enable or inhibit cohesion in everyday urban life.

4.4.4 Conclusion

The review demonstrates that public spaces can indeed foster cohesion, but only under specific conditions where physical affordances, multiplicity of different user groups and needs, and perceptions are aligned. Yet, the field remains constrained by fragmented disciplinary approaches, inconsistent operationalisation of outcomes, and limited attention to contextual moderators such as age, ethnicity, or neighbourhood histories. This pattern resonates with the conceptual and empirical gaps identified earlier in Chapter 2, where cohesion was shown to be theorised across perceptual, interactional, and group-based domains but rarely integrated in practice.

Taken together, the SLR findings highlight two priorities. Advancing this research requires both *standardisation* and *flexibility*: developing common indicators to enable meaningful comparison across contexts, while also embedding adaptive frameworks sensitive to local socio-demographic and perceptual variation. Without such a dual strategy, cross-study learning risks being either overly abstract or narrowly context-bound. On the other hand, more explicit integration across disciplinary silos is needed, both in terms of research methodology and research focus. Studies grounded in urban design and planning tend to prioritise physical attributes and spatial form, whereas sociological and psychological work foregrounds lived mean-

ings, symbolic cues, and everyday encounters. Bridging these traditions is essential if cohesion is to be evaluated in ways that are both theoretically rigorous and practically actionable.

Addressing these issues has implications beyond academic debates. The absence of clarity in definitions, measures, and mechanisms constrains how policymakers and practitioners assess whether public spaces are inclusive and resilient. By consolidating diverse approaches and identifying their limitations, this review contributes an evidence base that allows urban governance to move from descriptive accounts of participation and use towards evaluative frameworks for inclusivity. This concern links directly to the structured policy review (Chapter 5), which examines how policy instruments themselves frame and operationalise public space quality and cohesion outcomes, and whether they provide the conceptual and evaluative resources necessary to address these gaps.

In conclusion, the SLR establishes the importance of treating public space as a conditional and context-sensitive contributor to social cohesion, while also exposing the lack of conceptual integration and evaluative consistency in existing research. It sets the stage for the next chapter's analysis of policy frameworks, where we assess how such gaps are reflected, reinforced, or contested in governance and practice.

Chapter 5

Structured Policy Review

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5.1 Introduction

This chapter presents the findings of the Structured Policy Review (SPR) conducted on the UK policy frameworks addressing *public space* and *social cohesion*. The purpose of this chapter is to provide an empirical account of how these two domains are represented, operationalised, and evaluated in policy. While the structured policy review establishes a replicable procedure for mapping the key policies on public space and social cohesion, the findings should be read as evidence of how problems are framed and prioritised rather than as a comprehensive account of implementation practices. In this sense, the analysis contributes to the identification of the broader *policy problem spaces* around public space and social cohesion, highlighting the logics, priorities, and contradictions embedded in the policymaking and governance. Understanding these problem framings is essential for situating subsequent empirical findings, which serve to challenge or extend the policy landscape revealed here.

This study aims to critically examine the intersection of public space and social cohesion policies in the UK, focusing on their governance, policy formulation, and outcome evaluation. By employing a structured policy review methodology, the research aims to:

1. Identify how public spaces are integrated into urban and public policies at national and local levels.

2. Assess the measurement of physical and social outcomes in achieving quality public spaces.

3. Explore the interpretation and evolution of social cohesion across policy domains.

4. Highlight synergies, conflicts, and gaps in the current policy landscape to inform future policymaking.

The presentation of findings proceeds in five stages. Section 5.2 provides the *contextual background*, situating the evolution of UK policies on public space and social cohesion within wider shifts in governance and urban policy. Section 5.3 addresses the governance, strategic orientations, and performance measurement practices of public space policies. Section 5.4 examines three policy problem spaces through which social cohesion is interpreted and operationalised. Section 5.5 presents a critical discussion of the cross-domain implications of these findings for urban policy and governance. Section 5.6 concludes by positioning the review as a foundation for the empirical analyses that follow.

5.2 Contextual Background

The ongoing changes in the urban environment have renewed the interest of UK planning and public policy in improving quality of life and urban liveability (Lloyd et al., 2016). Urban development is no longer focused solely on economic growth and housing development (Cleave & Arku, 2020), nor is it solely concerned with the urban policy of the local public administration and central government (Bailey, 2010; Dempsey, 2009). Instead, it has transitioned to a much more citizen-centric and place-based process driven by policy and practice that offers good quality urban public spaces responsive to citizens' everyday life (Marans, 2015; Qi et al., 2024), with greater focus on the effective use of public environments (Nelischer & Loukaitou-Sideris, 2023), the wellbeing of citizens and diverse communities (Alidoust et al., 2022), and the social dimension of urban sustainability (Janssen et al., 2021).

The UK government's "take back control" pledge under the current Prime Minister Keir Starmer is one of the new policy lexicons which pledges to deliver community development initiatives and urban renewal projects to address social disadvantage and area inequality (Tudor, 2024). This line of place-based policies acknowledged the need to address spatial inequalities in terms of enhancing urban infrastructure and revitalising underdeveloped and neglected urban areas (N. Gray & Broadhurst, 2023). In the post-Brexit political context, with increased focus on cities and towns through initiatives like the *English Devolution White Paper* (The Ministry of Housing, Communities and Local Government, 2024), local communities and local authorities have gained support and ownership (i.e., the Community Ownership Fund in 2024/25) to shape their places for delivering social and economic outcomes for a better quality of life. This reflects significant policy transformation, particularly with frequent references to addressing spatial disparities and area inequalities.

While these efforts aim to promote social equity and diversity, countering socio-spatial polarization in cities like Liverpool (Arnold & Hickson, 2022), the UK's engagement with social cohesion policies has a much longer history. Concepts like "community cohesion" and "equality" became central in the early 2000s as responses to challenges around immigration, ethnicity, and cultural relationships. Earlier examples include the policy focus of Tony Blair's New Labour government on building "social capital" (Lund, 2007), the publication of *Guidance on Community Cohesion* by the Local Government Association (LGA), and David Cameron's "Big Society" initiative (Westwood, 2011) which further underlined the UK's longstanding commitment to fostering (social) cohesion and equity.

Although policies aiming for social cohesion are often shaped (and interpreted) to

engage with religious differences, identity (Wetherell, 2007), security and immigration discourse, they reveal the ongoing urban development challenges related to housing development, infrastructure investment, community cohesion and resilience (M. J. Hickman & Mai, 2015; Markovich, 2015), driven by the socio-economic heterogeneity of contemporary societies (Calafati et al., 2022; . T. Yu et al., 2023). This reveals critical gaps in the policy literature on social cohesion in terms of conceptual clarification, cross-sectional integration across policy domains (i.e., housing, public health, and education), the challenges in designing place-based interventions tailored to specific dimensions (i.e., trust, inclusion, or social capital), and the policy capacity of long-term impact assessment (Ratcliffe, 2012).

Public space and social cohesion are often considered "wicked problems" (Dempsey & Burton, 2012) or "ill-defined problems" (Jenson, 2010) in urban and public policy, due to their complexity, interdependence, and resistance to conventional quantitative methods that are available to the planning and operations research communities (Dunn, 2012) and policy studies (Head, 2019). They represent complex policy problems because multiple policy stakeholders hold different formulations of the "same" problem situation, while various external environmental, political, and socioeconomic factors intersect with these differing representations of the problem (Dunn, 2012). Therefore, this structured policy review proposes a structured policy review methodology drawing upon the problem structuring procedure developed by Dunn (2012) and the analytical framework for understanding policy formulation researched by Jordan and Turnpenny (2015) (Section 3.6). It aims to critically engage with public space and social cohesion policies by assessing their problem situations[1] and problem representations[2] within their designated policy spaces. This research approach focuses on the use of systematic procedures and the public policy cycle (Howlett et al., 2009) for structuring and addressing policy issues that are ill-defined, ill-structured, or wicked.

5.3 Public Space Policy Landscape

5.3.1 The governance of public space in the UK

The review of national and local frameworks demonstrates that public space policy in the UK is shaped by a dense and often fragmented set of instruments, span-

[1]Problem situations are "an indeterminate set of conditions that may give rise to the formulation of a problem" as identified by John Dewey (Dunn, 2012).

[2]Problem representations are subjectively meaningful representations of problem situations; they are not discrete material or mechanical entities, but are created by stakeholders (e.g., residents, planners, policymakers, developers, city councils, etc.) and are complex because multiple stakeholders interact to produce different representations of the problem (Dunn, 2012).

ning central government directives, local planning documents, and discretionary guidance. At the national scale, the *National Planning Policy Framework* (NPPF) establishes broad imperatives of sustainability, design quality, and accessibility (Paterson, 2012), reinforced through statutory instruments and guidance. These are further supplemented by place-based initiatives such as the *English Devolution White Paper* and the *Community Ownership Fund (2024/25)*, which emphasise the role of local communities and local authorities in shaping public environments (The Ministry of Housing, Communities and Local Government, 2024). Together, these frameworks articulate a vision of public space as a vehicle for economic competitiveness and urban regeneration (Ghahramanpouri et al., 2015; Pugalis, 2009), but less consistently as a platform for everyday sociability and inclusion (Nelischer & Loukaitou-Sideris, 2023).

Governance arrangements reveal a complex mixture of regulatory and discretionary mechanisms. National initiatives such as the *Green Infrastructure Framework* (GIF) and Green Belt policy anchor environmental priorities, while legal instruments such as the *Localism Act (2011)*, *the Community Infrastructure Levy*, and *Public Space Protection Orders* (PSPOs) provide discretionary powers to local authorities. As Carmona (2017) argues, this creates a continuum where design guidelines, conservation controls, and additional review processes coexist with ad hoc local interpretations of quality. The effect is a governance environment in which public space creation and management are continually shaped by overlapping regulatory frameworks, fiscal pressures, and urban development logics (Punter, 2007b).

This institutional layering aligns with critiques of UK urban governance more broadly, where national policy sets out aspirational principles but devolves responsibility for delivery to local authorities with uneven resources and capacities (Gaffikin et al., 2010; Magalhães & Carmona, 2006). The persistent tension between central steering and local discretion has reinforced a fragmented governance structure: while policy rhetoric consistently emphasises inclusivity, vibrancy, and liveability, implementation often defaults to economically motivated development regimes (Liang et al., 2022). In summary, national frameworks define public space in largely normative terms, foregrounding sustainability, accessibility, and economic vitality. Yet their governance logics remain highly dependent on discretionary local interpretation and funding availability.

5.3.2 Local Policies on Public Spaces

Local authorities interpret national frameworks within their own institutional, fiscal, and spatial contexts, producing a highly heterogeneous set of local public space strategies. Across the 22 city frameworks reviewed (Table G.1), public space con-

sistently emerges as a policy instrument for advancing multiple objectives, yet the balance of priorities varies substantially. Some cities emphasise public space as a lever for economic regeneration, particularly through high street renewal and urban branding, while others prioritise environmental resilience, heritage conservation, or community health.

This variation reflects what Magalhães and Carmona (2006) describe as the duality of design governance: local policy simultaneously enacts regulatory requirements and mobilises visionary aspirations. In practice, local governments are often compelled to pursue "urban surplus value" by leveraging distinctive physical or cultural assets, whether through waterfront regeneration (Fageir et al., 2020; Vale de Paula & Manuel Gonçalves, 2024), high street restructuring (Ntounis et al., 2023; Peel & Parker, 2017), or the branding of green and open spaces (Bell et al., 2007). These strategies frequently align with wider city-marketing agendas, using public space as a medium for external promotion and competitive positioning (Bonakdar & Audirac, 2020; Eshuis & Klijn, 2017).

Despite this diversity, several themes recur across local frameworks. Table 5.1 summarises the key orientations, which can be grouped under four broad headings: (1) physical characteristics such as accessibility and legibility; (2) strategic approaches emphasising inclusive design, sustainability, and placemaking; (3) social considerations including identity, cohesion, and capital; and (4) urban branding agendas, where public space is tied to narratives of the "smart city", "zero-carbon city", or "creative city" (Caprotti, 2019; Jenkins et al., 2020; Pratt, 2010).

Local strategies are further constrained by fiscal austerity and uneven private investment. While national funds such as the Towns Fund and the Future High Streets Fund provide temporary injections of support (Ministry of Housing, Communities and Local Government, 2024), long-term delivery relies heavily on developer contributions and public–private partnerships (Carmona, 2017; Harvey, 2006). This dependence reinforces inequalities. Wealthier cities can leverage investment to deliver ambitious regeneration schemes, whereas resource-constrained authorities often adopt incremental or defensive approaches to public realm management.

The result is a fragmented geography of public space provision in which accessibility and functionality are near-universal policy aims, but the social role of space, particularly in relation to cohesion and inclusion, is unevenly addressed. As Ravazzoli and Torricelli (2017) note, public space is closely interwoven with urban mobility, and yet policies frequently treat movement infrastructure and social interaction as separate domains. Similarly, while public consultation and community engagement are regularly invoked, they are seldom institutionalised as binding commitments, rais-

Table 5.1: Themes and sub-themes of policymaking interests in public space policies.

Themes of Policymaking Interests	**Sub-themes of Policymaking Interests**
Physical characteristics of public spaces	• Accessibility
	• Functionality
	• Connectivity
	• Legibility
	• Permeability
Strategic approaches of public space policies	• Integrative development and inclusive design
	• Sustainable neighbourhood development
	• Positive/people-centred placemaking
	• Public realm of healthy and vibrant lifestyle
	• Places of economic prosperity and community growth
	• Resilient and adaptive to environmental/climate change
Social considerations	• Place attachment / Place identity
	• Social cohesion / Community cohesion
	• Social inclusion / Social mixing
	• Social capital
City/urban/place branding via public spaces	• Smart / Digital city
	• Zero-carbon city
	• Sport city
	• Outdoor city
	• Liveable city
	• City of Heritage

ing concerns about tokenism and limited transfer of power (Magalhães & Carmona, 2006).

In conclusion, local public space policies are shaped by distinctive geographies, fiscal conditions, and political ambitions, producing diverse interpretations of what constitutes a "quality" public realm. This diversity reflects the challenge of establishing consistent standards for inclusivity or cohesion at the national level, and highlights the importance of attending to local policy context when evaluating public space outcomes.

5.3.3 Performance Measurement of a Public Space Policy Objective

When policymakers and politicians see an advocate view of public space, for whom it is the 'quality public spaces' at the forefront of facilitating liveability, sustainability, social cohesion, and economic growth (Carmona, 2019b). The policy objective of 'quality public spaces' therefore has created the need for performance measurement that evaluates the quality of public space either in the context of policy evaluation purposes or attributing to the pragmatic purposes of management. As Carmona and Sieh (2008) explained: "a holistic view of performance in planning should reflect both service-oriented and product-oriented perspectives of the discipline." In this regard, evaluating (for) quality public spaces already seems intractable with the complexity involved in the review of design practice (Punter, 2007a), the management of public space (De Magalhães & Carmona, 2009), the sustainability of urban design (Gil & Duarte, 2013), let alone measuring the quality of public space (Mehta, 2014) or even post-occupancy evaluation (Biddulph, 2023).

The current policy and research on performance measurement related to public space have largely attributed to the review of urban design and management practice (Carmona, 2019b; Evans, 2014; Piroozfar et al., 2019) and to appraise planning policies over designated public space interventions or projects (Bell et al., 2007; N. Harris & Thomas, 2004; Pugalis, 2009; Woolley, 2006). Such distinction in attempts implies the performance evaluation of public space related policy objectives is surmountable when it is accepted both as a pragmatic administrative process and a policy driven tool. This resonates with both the service and the product dimensions of performance measurement when it comes to the performance evaluation of public space, two key elements of the analytical framework developed by Carmona and Sieh (2008).

On the service dimension, the quality and uses of public spaces have been assessed from different perspectives, i.e., addressing user needs, staying relevant and adaptive. For example, policy research on performance measurements attempts to deliver quality public spaces include:

- addressing the needs of public space users including children and young people (Woolley, 2006), the elderly group (Brunelli et al., 2022), and women (Jupp, 2014; Navarrete-Hernandez et al., 2021);
- staying sensitive and equitable in public space design process and outcome in terms of planning for a diverse contemporary society (M. Harris & Young, 2009), linking cultural activity and economic vitality (Pugalis, 2009), and becoming more responsive to ecological (Smith & Levermore, 2008) and property

market challenges (White, 2015);

- being effective at delivering changes in response to broader socioeconomic contexts such as changes in property rights (Webster, 2007), the privatisation of public spaces (Langstraat & Melik, 2013), and shared public space for more integrated mobility (Barr et al., 2021; Ravagnan et al., 2022).

In line with the findings from local policy review (Sect. 5.3), the product dimension of performance measurement, on a granular level, is the linkage between quality of public spaces and the broader policy objectives, which has been made more about the delivery of sustainability, liveability, and improving quality of urban life. This is clearly represented in recent literature reviewing the quality and success of public spaces and design practices ranging from advancing assessment tools and indicators (Ameen et al., 2015), uncovering design briefing principles (Chapman & Larkham, 1999), understanding the social effects of public spaces (Dempsey & Burton, 2012; Trillo, 2016), and devising policy-informing agendas (Beck, 2009; Raman, 2010).

The literature related to public space policy review (i.e., design guidance and principles, planning policies and frameworks, planning and design practices, etc.) typically adopts the following approaches:

- Theoretical: Developing frameworks or systems aimed at improving or enhancing existing policies, regulations, and provisions.
- Opinion-based: Critiquing policy strategies through the lens of seminal planning theories or sociological perspectives.
- Statistical assessment: Comparing numerical data across designated temporal periods (e.g., before-and-after analyses) using census records or authoritative government datasets, such as employment rates, deprivation indices, and property values.
- Physical evaluation: Assessing the quality of the urban environment through spatial data, including measures of accessibility, density, mobility, and diversity.
- Objective-driven analysis: Calculating indices related to sustainability, quality of life, urban vitality, and physical and mental health.
- Textual thematic analysis: Conducting systematic reviews of relevant policies, grey literature, and online sources to synthesize key themes and areas of interest.

Some are detailed investigations encompassing careful data collection, field surveys and indicator analysis processes (Cheshmehzangi, 2015; Moore et al., 2006), while

others require a more due diligence approach via peer assessment (Gallent & Wong, 2009), methodological review (Ameen et al., 2015), and strategic case study (Cattell et al., 2008b).

By and large, these different trajectories lend themselves to a range of political, cultural, and institutional contexts of provision and management of public spaces. They embrace the question of reconciling measurement approaches, as Carmona and Sieh (2008) argue when relating to planning: "A key practical dilemma, therefore, will be how can profoundly different assessment techniques and data types be brought together and related to make an overall judgment about planning's performance?"

5.4 Social Cohesion as a Policy Objective

Social cohesion has acquired a prominent position in British social and public policy since the early 2000s (Ratcliffe, 2012). Despite being considered as a 'quasi-concept' (Bernard, 1999; Jenson, 2010), it is a policy-relevant construct that is "configurative in nature" (Schiefer & van der Noll, 2017). Following the multi-dimensional conceptualisations of social cohesion advocated by the seminal works of scholars such as Bernard (1999), Jenson (2010), Dickes and Valentova (2012), and Schiefer and van der Noll (2017), the current paper attempts to clarify how social cohesion features in the UK public and social policy contexts, in addition to its relationship with the academic concept and the related scientific methods (i.e., a data-driven analysis of the situation (Bernard, 1999)). Examining the development of UK social policy since 2001 through a temporal lens on the construction and adaptation of social cohesion highlights how its underlying discursive and substantive content (Ratcliffe, 2012) has evolved in terms of policy interests and focus shifts as policymakers address societal challenges through different political agendas.

Social cohesion is often viewed as a key policy objective driving the development of public and social policies (Chan et al., 2006; Hulse & Stone, 2007), despite the complexities and political necessities present in contemporary British society motivated by immigration, socioeconomic disparity, or religion and ethnic diversity. Remaining a largely ill-defined term (Schiefer & van der Noll, 2017), its tacit understanding allows for flexibility in focus amongst the emergence of a series of policy initiatives and the establishment of political institutions surrounding different dimensions of social cohesion, namely, "social inclusion", "integration" (Phillimore, 2012b), "community cohesion" (Ratcliffe, 2012), and "social capital" (Cheong et al., 2007), which can be delineated and arranged into three policy problem spaces in terms of problem structuring (Dunn, 2012).

5.4.1 Inclusion as Policy Imperative

Inclusion has emerged as a recurrent frame across education, housing, health, and planning policy. Legislation such as the *Equality Act 2010* and the *SEND Code of Practice* foregrounds equal access to services, while local development plans increasingly reference inclusive housing and participatory design practices (Knight et al., 2023; Morrison & Burgess, 2014). Here, inclusion is framed as both an ethical commitment to reduce structural inequalities and a practical means of enhancing social outcomes. However, inclusion discourses are frequently sectoral, meaning that public space is often invoked only tangentially, through accessibility standards, housing quality indicators, or community participation clauses, rather than as a dedicated cohesion instrument.

Table 5.2: Key UK policy areas, policies, and objectives relevant to social inclusion.

Policy Area	**Key Policies**	**Policy Objectives**
Social Inclusion (General)	Equality Review (2007); Equality Act (2010)	• Identify barriers to equality and inclusion in public services • Create strategies to close social and economic gaps
Inclusive Education	Special Educational Needs and Disability (SEND) Code of Practice (2015)	• Ensure equal access to education for children with disabilities • Support schools to be inclusive
	Children and Families Act (2014)	• Improve outcomes for children with SEND • Involve families to support inclusivity
Equal Access to Housing	Town and Country Planning Act (2017)	• Provide local authorities with powers to require developers to contribute towards affordable housing provision
	Homelessness Act (2002)	• Accommodate qualifying homeless households until settled accommodation is obtained
	Affordable Housing Programme (2021–2026)	• Increase availability of affordable homes • Provide diverse housing options for vulnerable groups
Public Health	The Marmot Review (2010)	• Propose evidence-based strategies to reduce health inequalities
	Health and Social Care Act (2012)	• Provide equitable access to health services • Promote integrated health and social care services
Employment	National Living Wage (2016)	• Ensure all workers earn a wage that meets the cost of living • Reduce poverty and reliance on benefits

Table 5.2 provides a list of the key policy frameworks that directly address core aspects of social inclusion, such as access to services and employment opportunities for marginalised groups (Grimshaw et al., 2018). These policies represent central pillars of the UK's inclusion agenda in their contribution to inclusive education, equal access to housing (Haman et al., 2021; Morrison & Burgess, 2014), public health, and employment (Atkinson et al., 2004; Lysaght et al., 2012).

5.4.2 Integration and Community Cohesion

In the political context, integration has largely been an objective related to the settlements of migrants and refugees, a complex process that takes place at both national and local levels (Anderson, 2023). Since the 2000s, UK integration reflects a significant shift in the understanding of how to effectively incorporate diverse populations into society by moving from assimilationist tendencies to a more inclusive and pluralistic framework in terms of key policy objectives (Anderson, 2023; Phillimore, 2012a). This was primarily driven by the substantial "population churn" generated from the increase in immigration to Britain in the first half of the decade, which placed considerable strain on public services, especially the NHS, schools, social housing, and welfare systems (Ratcliffe, 2012). Social integration not only reflects the objectives of immigration policy formulation and provides a rationale for migrant integration as a two-way process, but it also guides the development of public policy actions, such as the implementation of policy instruments (e.g., the citizenship process (Bartram, 2019)) grounded in empirical, data-driven analysis using frameworks like the *Indicators of Integration* (Home Office, 2024).

In parallel with the integration policies, the community cohesion agenda aimed to tackle the growing challenges posed by immigration, demographic shifts, and increasing ethnic diversity, with a focus on fostering harmonious relationships between different cultural and ethnic groups (Ratcliffe, 2012). This policy notion has been subject to considerable criticism for exemplifying efforts over the question of ethnic and faith division as a response to the issue of "super-diversity" (Blake et al., 2008; Cowden & Singh, 2017). Nevertheless, community cohesion as a social policy agenda has evolved over time, beginning with its early conceptualisation in the *Cantle Report* (Office, 2001), followed by the emphasis on "life opportunities" in the *Commission on Integration & Cohesion's 2007 report*. Under the Cameron Conservative government, the focus shifted towards extremism and security (Office, 2015a), and more recently, the *Sewell Report* has taken an arguably balanced approach to addressing social disparities by introducing educational policy initiatives and recognising the implications of geographical inequalities (Tikly, 2022; Touihri-Mebarek, 2023). These developments reflect the ongoing challenges and complexities in building cohesive communities.

By identifying changes in government priorities regarding community cohesion, it becomes clear that the normative perspective of social unity plays a significant role in public policy formulation (Lowndes & Thorp, 2011). For instance, this is evident in the allocation of public funding for interfaith campaigns (Cowden & Singh, 2017) and the implementation of PREVENT strategies (Office, 2015b, 2023), highlighting the renewed emphasis on local contexts in these transformations. Focusing on re-

active measures, this line of policies appears to prioritise mitigating the symptoms of low cohesion, such as anti-social behaviour or community tensions, rather than proactively addressing systemic inequalities that underlie fragmentation.

Community cohesion policies emphasise a common identity and interaction between communities, while integration policies focus on providing equitable access to services for migrants while respecting their cultural differences. Both approaches share the goal of leveraging local initiatives that encourage collaboration and foster mutual understanding among diverse groups. However, tensions between the goals of unity and diversity can undermine the prospects for an "integrated and cohesive society" (Ratcliffe, 2012). Notwithstanding this limitation, it is essential for policymakers to strike a balance between promoting unity and preserving diversity. In addition to the constituents of concern, to achieve an integrated and cohesive society, addressing material inequalities, particularly regarding life opportunities, is seen as a crucial condition (Chan et al., 2006). Reducing disparities in living standards is essential for tackling geographical inequalities, while simultaneously preserving and enhancing ethnic diversity (McGhee, 2003; McGinn, 2008). This multifaceted strategy is vital for the effectiveness of integration and community cohesion policies in the UK.

5.4.3 Social Capital and Participation

The appropriation of the concept of social capital into UK public policy was a response to issues grounded in the processes of increasing social exclusion and spatial segregation under the Labour government in 1997 (Cheong et al., 2007), but focused more on the social relations and social structures through the promotion of mobility and social mix (Ferragina & Arrigoni, 2017). One of the foundational policy frameworks is the *National Strategy for Neighbourhood Renewal* (NSNR) introduced in 2001 (CLES, 2011), which advocates for collaboration among local authorities, community organisations, and residents, drawing collective experiences and encouraging collective action to identify and address local challenges (DCLG, 2015). In this context, and despite the challenges in pinning down explicit links between social capital and policy outcomes (Roche, 2004), the commitment to active citizenship remains central to policy strategies (Gaventa, 2004; A. G. Quinn, 2008). These emphasise community-led initiatives (e.g., *New Deal for Communities (NDC)* (DCLG, 2015)), the development of supportive networks (Council, 2024), and the promotion of volunteer programmes such as the *National Citizen Service (NCS)* (NCS, 2024).

Nonetheless, the 2010 election of the Conservative government signalled a shift in social capital policy focus towards developing "linking social capital" (Claridge, 2018) with David Cameron's *Big Society* agenda (Gov., 2024). This shift from public support to private responsibility (state-driven initiatives to community-led efforts)

highlights social capital as an important way to cope with social change whilst creating social capital by enhancing the role of local communities (Ferragina & Arrigoni, 2017). Policies and strategic programmes such as the *Localism Act 2011*, *Community Led Local Development Strategies 2013–2016* (Ministry of Housing Communities & Local Government (MHCLG), 2019), and the *UK Shared Prosperity Fund 2022* were established to support individuals and communities to build collaborative relationships with key institutions, fostering a more active and empowered role in decision-making and resource management.

Finally, it is worth noting that social capital features prominently across various key policy areas such as public health, housing, transportation, and education as a means of addressing the needs of disadvantaged communities to enhance policy outcomes (Elvy, 2019; Pavey, 2006; Warwick-Booth, 2008). In the UK, policies such as the *Transport Act 2000* emphasise community involvement in transport planning, recognising that social networks can influence travel behaviour and access to services. Research on participatory transport planning has shown that communities with robust social ties are more likely to advocate for effective public transport solutions that meet their specific needs (Elvy, 2019). In the realm of public health, legislation such as the *Health and Social Care Act 2012* (e.g., Healthwatch England (England, 2024)) highlights the importance of social capital in fostering community health improvement through collective action and support systems, contributing to better health outcomes for disadvantaged populations (Martindale, 2011). Furthermore, planning policies such as the *Planning and Infrastructure Bill* (Ministry of Housing Communities & Local Government (MHCLG), 2019) emphasise the role of social capital in revitalising communities by encouraging local engagement and ownership in regeneration projects, which leads to enhanced social cohesion and resilience (Holman, 2013).

Likewise, empirical research across these urban and public policy domains frequently uses social capital as a metric to assess the relationship between various approaches to harnessing social capital for policy formulation and policy effectiveness, illustrating how it influences and reflects policy outcomes (Flint & Kearns, 2007; Gannon & Roberts, 2020; Gewirtz et al., 2005; Schwanen et al., 2015). This line of policy formulation and research highlights a growing recognition of the essential role of social capital as both an indicator and an outcome in enhancing effectiveness across various public sectors in the UK, particularly in transport, public health, education, and housing.

Collectively, these three problem spaces reveal the fragmented yet overlapping ways in which social cohesion is constructed in UK policy. While the domains of inclu-

sion, integration, and social capital share common aspirations to reduce division and enhance resilience, their governance mechanisms, delivery instruments, and evaluative criteria remain largely siloed. This fragmentation is not simply administrative but reflects deeper tensions within UK policymaking: the balance between national steering and local discretion (Levitas, 2005), the trade-offs between universal principles and targeted interventions (Goodchild & Cole, 2001), and the longstanding challenge of reconciling social objectives with economic and spatial planning priorities (Ratcliffe, 2012).

Public space features only marginally within these debates, typically as an adjunct to other policy aims rather than as a field of cohesion policy in its own right. It is invoked indirectly, through accessibility requirements, community safety audits, regeneration programmes, or volunteering strategies, without being systematically integrated across domains (Worpole & Knox, 2007). Such a marginal positioning could be read as a weakness, suggesting that the role of space is under-recognised in shaping social outcomes. Yet it can also be interpreted as a reflection of the wider policy style in the UK, where complex social goals are pursued through sectoral entry points and indirect instruments rather than through explicit, cross-cutting frameworks (Rhodes, 1997).

This raises important implications for research and practice. On the one hand, the absence of a unifying perspective makes it difficult to assess how different strands of policy converge in everyday environments, or how the cumulative effects of fragmented interventions are experienced by communities (Carmona, 2014; Goodchild & Cole, 2001; Wells, 2018). On the other hand, the indirect and multi-layered treatment of public space opens opportunities for critical reinterpretation. Recognising public space as both a physical and symbolic infrastructure of cohesion requires not only empirical evidence about how spaces are designed and used, but also a conceptual lens that can trace how policy framings, institutional silos, and governance capacities shape those outcomes. The analysis presented here therefore points towards the need for a more integrative approach, one that treats public space as a mediating arena where social, spatial, and governance concerns intersect. The following section on cross-domain intersections develops this argument by examining where, and under what conditions, public space and cohesion policies converge, diverge, or remain disconnected.

5.5 Discussion and Implications

This review provides a critical review of urban public space and social cohesion in the context of UK urban and public policy. It aims to fill policy gaps by contributing

to the conceptual development of public space and social cohesion as intersecting policy domains. The findings from this structured policy review offer a nuanced understanding of how urban public space and social cohesion are addressed and integrated into national and local policies, as well as their interplay within the context of UK governance. Although studying the entire public policy process or policy cycle (agenda setting, formulation, implementation, evaluation) (Hill, 2009; Howlett et al., 2009) is beyond the scope of this chapter, we note the critical role that problem structuring can play in agenda setting and policy formulation. Public space and social cohesion are frequently treated as "wicked" or "ill-defined" problems (Dempsey & Burton, 2012; Hulse & Stone, 2007), making it essential to trace gaps and evolving conceptualisations within UK policy.

Although widely endorsed within planning and public policy, public space has been subject to limited critical review in terms of reflecting the political and governance contexts within which urban design operates (Parkinson, 2013; Punter, 2011). Persistent tensions remain between public interest and privatisation, a theme resistant to successive policy initiatives (Carmona, 2017; Iveson, 2007). Depending on the sustainability issue under consideration, the boundaries between regulatory and discretionary systems have become blurred (Boyko et al., 2005; Punter, 2011), complicating intervention and governance. These complexities extend to policy design, implementation, and performance measurement (Carmona & Sieh, 2008).

At the same time, debates on liveability, sustainability, and integration highlight overlaps between social, economic, and environmental policy agendas. Urban policy frequently foregrounds social constructs such as liveability (Lloyd et al., 2016), integration (Pieterse, 2004), and social sustainability (Davidson, 2010). These policy framings require attention to the social dimensions of urban life, particularly in diverse neighbourhoods and deprived districts.

Fiscal incentives for public space investment (Muminovic, 2017) and strategic design governance (Carmona, 2017) have been tied to concepts of place-making, place-shaping, and place-keeping (Akbar & Edelenbos, 2021; Dempsey & Burton, 2012; Zamanifard et al., 2019). Such initiatives aim to promote conviviality (Tallon & Bromley, 2004; Wessendorf, 2013) and sustainability, yet often result in urban spaces shaped more by policy rationales and planning interventions than by everyday lived experiences (Lefebvre, 2014). This reflects a persistent gap in policy attention to the social functions of public space, particularly in representing diverse user perspectives (Aelbrecht, 2016).

In parallel, UK social cohesion policy has evolved in response to socio-economic inequalities and fragmentation. While policies emphasise shared values, reducing

inequalities, and fostering social capital, critiques highlight the ambiguities in defining cohesion, whether framed as integration or assimilation, material inequality or social exclusion (Cowden & Singh, 2017; Ratcliffe, 2012). Scholars have sought to clarify these constructs (Jenson, 2010; Schiefer & van der Noll, 2017), but persistent ambiguities complicate their operationalisation. Analysts reflect on the rationale for specific policy interventions (Hulse & Stone, 2007), the challenges of measurement (Chan et al., 2006), and the risks of over-simplification (Anderson, 2023).

These intersections reveal that UK public space and social cohesion policies often overlap in principle but remain fragmented in practice. Policies tend to operate in silos, privileging economic objectives (e.g., innovation and productivity (Bachtler & Begg, 2017)) and culturalist agendas (e.g., ethnic diversity, class, livelihood inequality (Ratcliffe, 2012)), with limited integration into the design of everyday environments. Influenced by EU cohesion policy since 1989, UK approaches have promoted place-based development (Kotzebue, 2016), but their partial and uneven application undermines the goal of building sustainable communities (Forrest & Kearns, 2001; M. Harris & Young, 2009; Head, 2019; Ratcliffe, 2012). The absence of a unifying perspective makes it difficult to assess how fragmented interventions converge in practice, yet the multi-layered and indirect treatment of public space also opens opportunities for reinterpretation (Amin, 2008; Carmona, 2010a; Madanipour, 2003).

Our structured policy review highlights significant gaps in the policy landscape:

1. the implicit imbalance between inclusivity and economic prosperity,
2. the challenge of reconciling measurement approaches to post-occupancy evaluation and social outcome assessment,
3. the fragmented nature of public space governance and the lack of consistency in adaptive cohesion strategies, and
4. the disconnection between cohesion problem spaces in linking community division, socio-economic inequality, and geographic disparities.

These gaps reflect broader limitations in UK policy processes. Current approaches operate within sectoral silos, with insufficient integration across domains and levels of governance. As a result, agenda setting and policy formulation for public space and cohesion often fail to converge (Hill, 2009), and long-term evaluation mechanisms remain weak (Howlett et al., 2009). Addressing these challenges requires shifts toward problem-structuring and iterative policy formulation (Dunn, 2012), systems thinking, and scenario approaches (Qi et al., 2024). Such methods can illuminate how socio-economic disparities, cultural practices, and governance structures interact to influence cohesion outcomes, and how trade-offs, synergies, and stakeholder

priorities can be identified in practice (Jordan & Turnpenny, 2015). Embedding these approaches demands institutional support for cross-sectoral collaboration and the mobilisation of academic evidence in policy contexts (Phillimore, 2012b; Tosun & Lang, 2017).

5.6 Conclusion

The planning and urban design literature typically focuses on the apparent inherent qualities of good urban space, attributes such as permeability, accessibility, and functionality to sustain specific activities. Much of this work emphasises physical design, specific projects, and blueprints that are essentially static. Yet consideration of public space as a matter of governance introduces additional themes that interact with one another and with economic and social processes that evolve over time. From a governance perspective, the apparently static character of public space is misleading in terms of clarifying what is visible at any given moment is the product of a succession of policy initiatives, ranging from the creation of new spaces to maintenance and adaptation. Even in the absence of explicit policy, public space changes through the cumulative effects of individual actions, building decay, or ecological processes such as vegetative invasion.

The governance of public space can be conceptualised as the outcome of interactions among varied actors, including businesses, civil society groups, and public institutions (Zamanifard et al., 2019). However, a simple reference to "power" risks oversimplification. Public space, as its name suggests, is a public good, governed within an administrative framework that is at once centralised, through national legislation and planning guidance, and fragmented, through conflicts between different policy instruments and levels of government. Power therefore refers not only to influence but also to the ability of actors to contribute resources and enable the execution of policy objectives (Jordan & Turnpenny, 2015; Mazumdar et al., 2023). As this chapter has shown, a structured classification of policies remains central to making sense of these dynamics.

Public space is also shaped by overlapping policies for social inclusion, social cohesion, and social capital. These overlapping fields share an underlying recognition that public space should contribute to civil society and social justice (Brain, 2019; Rutter, n.d.; Whitlock, 2007). Yet social cohesion policy has often been overshadowed by immigration and economic objectives, including an increased emphasis on economic growth and, relatedly, place-branding strategies (Paganoni, 2012). Branding exercises aim to promote areas to investors and visitors, particularly in post-industrial cities, by reshaping urban image and identity. Such strategies have en-

couraged local councils to protect green spaces, enhance the appearance of streets, and, in some cases, create new public spaces. However, by prioritising the attraction of visitors and investment, branding does not necessarily address inequalities in public space provision, for example by improving amenities in poorer neighbourhoods (Hankinson, 2001).

Building on the findings of this study, future research should prioritise the development of standardised tools for evaluating both the physical and social outcomes of public space policies. This includes metrics for assessing social cohesion, inclusivity, and community wellbeing (Schiefer & van der Noll, 2017), and their integration into post-occupancy evaluations and long-term impact assessments (du Toit & Mouton, 2013). There is also a pressing need to investigate how public space and social cohesion policies can be better integrated across sectors and levels of governance. Key questions concern the role of multi-level governance (Kearns & Forrest, 2000), cross-sectoral collaboration, and community participation in creating more cohesive and inclusive environments (Pemberton, 2008; Zamanifard et al., 2019). Methodologically, the application of problem-structuring approaches such as systems thinking and scenario contextualisation offers a promising means of navigating complexity and interdependence (Dunn, 2012). Future work should consider how these methods can be embedded within policymaking to generate adaptive and resilient strategies.

Finally, comparative research across countries and regions could illuminate how political, cultural, and socioeconomic contexts shape public space and social cohesion policies, identifying transferable lessons and best practices. By addressing these gaps, future research can inform the development of more inclusive, equitable, and sustainable urban policies that prioritise everyday community needs while strengthening social cohesion in the UK and beyond. What this review also makes clear is that policy framings often operate at a high level of abstraction, with limited attention to the everyday practices through which public spaces are inhabited, negotiated, and contested. To address this gap, the thesis now turns to empirical analysis. The next chapter presents behavioural mapping of selected UK urban spaces, providing systematic evidence of patterns of presence, activity, and interaction. In doing so, it directly responds to the research questions by linking policy aspirations to observed social life in public spaces, and by grounding abstract governance frameworks in the lived realities of urban environments.

Chapter 6

Behavioural Mapping Findings

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6.1 Introduction

This chapter empirically addresses Research Question 2: *How do spatial, temporal, demographic, and relational conditions structure patterns of social behaviour and group presence in public space?* Building on the ecological–social lens established in Chapter 2, we undertake a detailed examination of how social dynamics materialise across Sheffield's diverse urban environments.

We approach urban public spaces as complex, adaptive ecologies where behaviour emerges from the continuous negotiation between physical affordances and social relations (K. M. Brown, 2012). This perspective moves beyond deterministic spatial models, whether "third places" or "fourth places" (Aelbrecht, 2016; Oldenberg, 2007), and beyond reductive interpretations of social interaction, such as those limited to spatial configuration metrics (Askarizad et al., 2024). Instead, we emphasise the fluid, context-dependent nature of presence, co-presence, and exclusion, recognising that public spaces are dynamic arenas in which inclusion and marginality are continuously enacted, resisted, and redefined.

The empirical observations make this complexity visible. Patterns of behaviour and group presence vary markedly across locations, times of day, and demographic profiles. Such heterogeneity resists simplistic aggregation, requiring an analytical framework capable of respecting contextual variation while revealing structured regularities. To meet this need, we implement a structured spatial–temporal segmentation strategy, which allows us to profile user groups and social behaviours at the segment level with greater precision and ecological validity (J. Wu, 1999). This approach also addresses a common limitation in public space studies, namely, the tendency to overgeneralise from aggregated data, by foregrounding the relational and situational specificity of observed behaviours.

Within the broader architecture of the thesis, this chapter operationalises the social–ecological lens through systematic behavioural observation and multidimensional clustering analysis. It complements the psychosocial modelling in Chapter 7, which examines individual perceptions and experiences, and the interpretive accounts in Chapter 8, which capture lived narratives of space use. Together, these chapters form a coherent mixed-methods framework that traces social cohesion from ecological structure, through psychosocial processes, to subjective meaning-making.

The chapter proceeds as follows. Section 6.2 provides an overview of the dataset and the exploratory data analysis. Section 6.3 presents the cluster analysis results in terms of examining the composition of user groups and the distribution of social behaviours across these segments. The chapter concludes by situating these findings within the research's conceptual and empirical framework, highlighting their specific

contribution to understanding the situated, dynamic unfolding of social cohesion in urban public space.

6.2 Overview and Exploratory Data Analysis

6.2.1 Data Overview

Behavioural mapping was conducted in multiple public spaces across a one-year period, with approximately 1,000 observations recorded monthly, as detailed in chapter 3 (Section3.7). The dataset was built upon a systematic observational framework that prioritised regular and high-density moments of public life, typically during the afternoons and on days with favourable weather conditions (Aelbrecht, 2016; Mehta & Bosson, 2021). Observations were carried out using a time-allocated and space-based protocol, ensuring coverage of key daily, weekly, and seasonal rhythms. Each mapped observation recorded the characteristics of individuals and groups using the space, including:

- Demographic attributes: life stage (e.g., toddler Ls1, young adolescent Ls2, adult Ls3, the elderly Ls4), gender (e.g., female G1, male G2), and ethnicity (e.g., Asian E1, Black E2, White E3, Southeast Asian E4, Mixed race E5)
- Social interaction typology: enduring (E), fleeting (F), passive (P)
- Social relationship typology: alone (Al), intimate (Int), personal (Per), social (Soc)
- Activity type: walking (W), lingering (L), sitting (S)
- Temporal and spatial attributes: location, time of day, day of week, month, and season

The resulting database[1] consists of 9,908 individual data points and offers a rich spatial-temporal representation of public life, which serves as an empirical foundation for studying how public space enables or constrains different forms of social behaviour.

6.2.2 Exploratory Data Analysis

This section employs targeted quantitative analysis to highlight the inherent heterogeneity within the behavioural mapping data across spatial, temporal, and demographic dimensions. These empirical observations provide the statistical foundation

[1]The original dataset is publicly avialible at https://github.com/jieqi1214/psychosocial-analysis/blob/670dfc7c9e3d4799656c560593234d0f795b62c1/Q0_9908datapoints22052025.csv

for the proposed segmentation strategy. Critically, they illustrate the complex and adaptive nature of human-environment interactions in public spaces, aligning closely with the social-ecological conceptual lens detailed in Chapter 3.

The temporal distribution of the observations (Figure 6.1) reveals distinct patterns between weekdays and weekends. Weekday observations are relatively evenly spread from 12:00 to 15:00, whereas weekend activity peaks sharply after 13:00, likely reflecting post-lunch social aggregation common in leisure contexts (Mehta, 2019b; Whyte, 1980). These patterns emerge from both intrinsic urban behavioural rhythms and the purposive sampling of peak periods. While the observation schedule shapes the data distribution, the figure provides a meaningful depiction of temporal variation in public space use, offering a foundation for further detailed analysis.

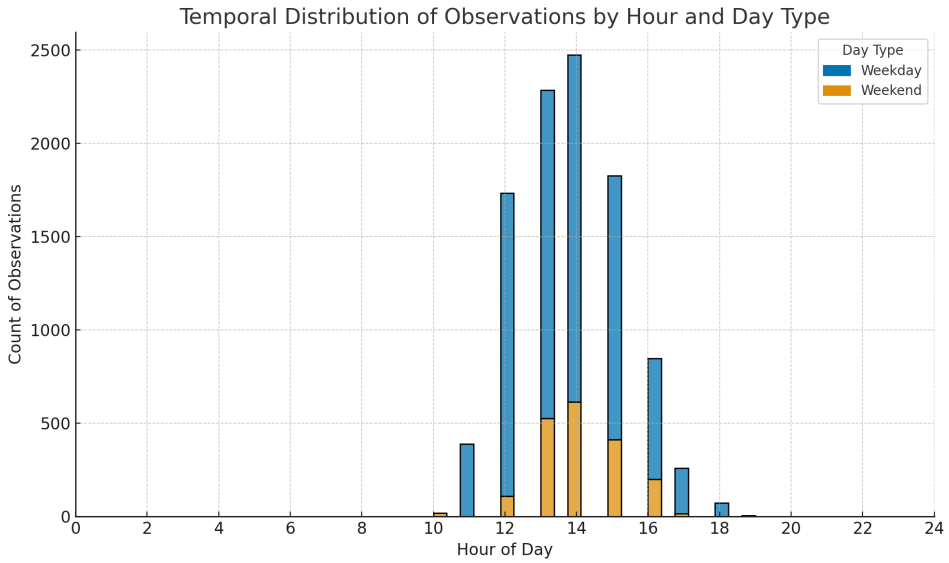
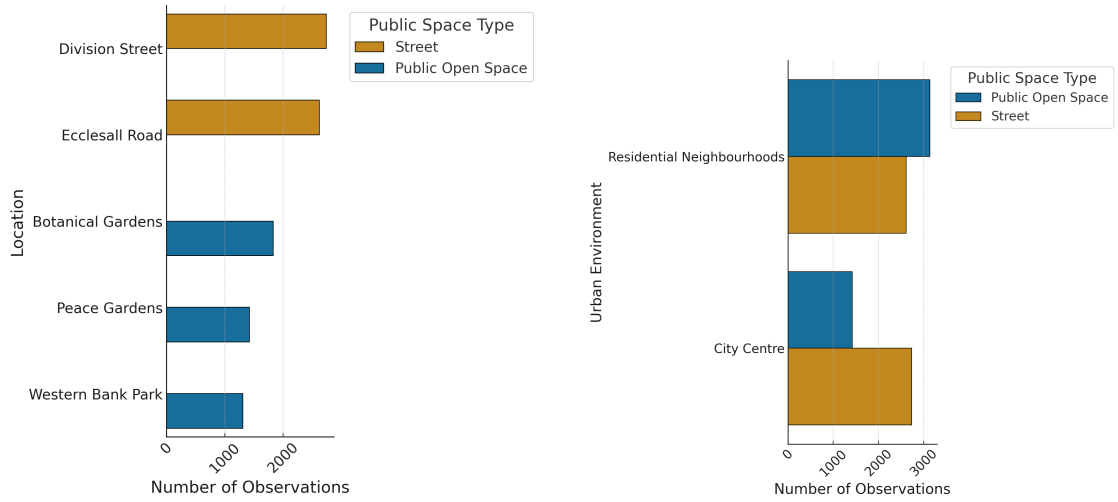


Figure 6.1: Temporal distribution of observations by hour and day type (weekday vs. weekend)

Our analysis shows significantly higher concentrations of people in city centre locations (Figure 6.2). This aligns established patterns of intensified pedestrian flows and social interaction in urban cores (Jacobs, 1961), consistent with their role as hubs for commerce, transit, and culture, drawing diverse users. In contrast, residential neighbourhoods, despite large open spaces, show a more dispersed pattern. The extended street networks here contribute to lower user density and more diffuse social activity (Carmona, 2010a). This highlights fundamental differences in public space use across urban contexts.

Table6.1 shows clear site-to-site differences in who visits the public spaces:

- Adults (Ls3): 66.5% at Botanical Gardens vs. 77.8% at Western Bank Park
- Older Adults (Ls4): 11.5% at WBP vs. 24.1% at BG



(a) public space type (b) urban environment type

Figure 6.2: Spatial distribution of observations by public space and urban environment type

- Women (G1): 58.2% at BG vs. 52.3% at ER
- White users (E3): 62.6% at Division Street vs. 82.1% at BG
- Asian users (E1): 8.3%–19.3% across all sites

These shifts underline that demographic presence is highly context-dependent, in addition to reflecting the way by which how everyday interactions and community bonds co-produce who feels welcome and engaged in each space. Recognising these spatially contingent demographic footprints is essential for understanding how inclusion, visibility, and marginalisation dynamics play out in urban public spaces.

Alongside the temporal distribution of observations (Figure 6.1) and spatial patterns across urban environments and public space types (Figure 6.2), these demographic data provide a comprehensive overview of the dataset. This multi-dimensional foundation ensures subsequent analyses are grounded in a clear understanding of who occupies these urban spaces and when and where interactions occur.

Figures 6.3 and 6.4 plot social interaction and relationship typologies by urban environment and day type. Weekday/weekend splits draw on Gehl (2011) and Whyte (1980) to capture work–leisure rhythms while ensuring robust sample sizes. City-centre vs residential aggregation follows ecological–social theory (Shirazi, 2019; Tallon & Bromley, 2004), reducing sparsity and aligning with distinct urban social ecologies.

Enduring interactions and intimate/personal relationships peak in public spaces located in residential neighbourhood on weekdays, reflecting routine community ties, whereas fleeting interactions and broader social exchanges dominate city centre

Table 6.1: Percentage Distribution of Demographic Groups Across Public Space Locations

User Group	Botanical Gardens	Division Street	Ecclesall Road	Peace Gardens	Western Bank Park
Ethnicity					
Asian (E1)	8.3%	13.3%	9.9%	19.3%	13.0%
Black (E2)	2.1%	7.8%	5.8%	6.9%	5.4%
White (E3)	82.1%	62.6%	78.0%	65.6%	66.3%
Southeast Asian (E4)	6.8%	15.1%	5.0%	7.2%	14.0%
Mixed Race (E5)	0.7%	1.2%	1.3%	1.1%	1.3%
Gender					
Female (G1)	58.2%	47.4%	52.3%	47.7%	55.3%
Male (G2)	41.8%	52.6%	47.7%	52.3%	44.7%
Life Stage					
Toddler (LS1)	7.3%	5.6%	6.4%	7.7%	8.5%
Child/Teen (LS2)	2.0%	2.4%	2.4%	6.0%	2.1%
Adult (LS3)	66.5%	77.0%	71.9%	67.5%	77.8%
Older Adult (LS4)	24.1%	15.0%	19.3%	18.8%	11.5%

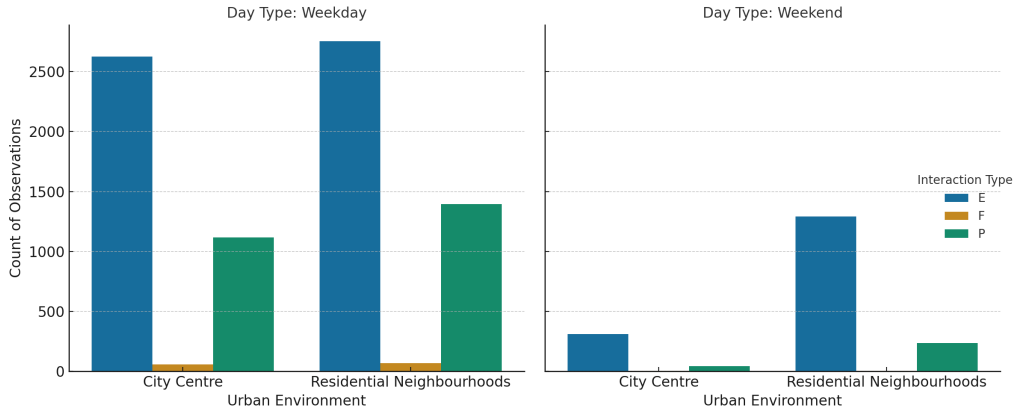


Figure 6.3: Social Interaction Typology (i.e., enduring, fleeting, and passive) by Urban Environment and Day Type

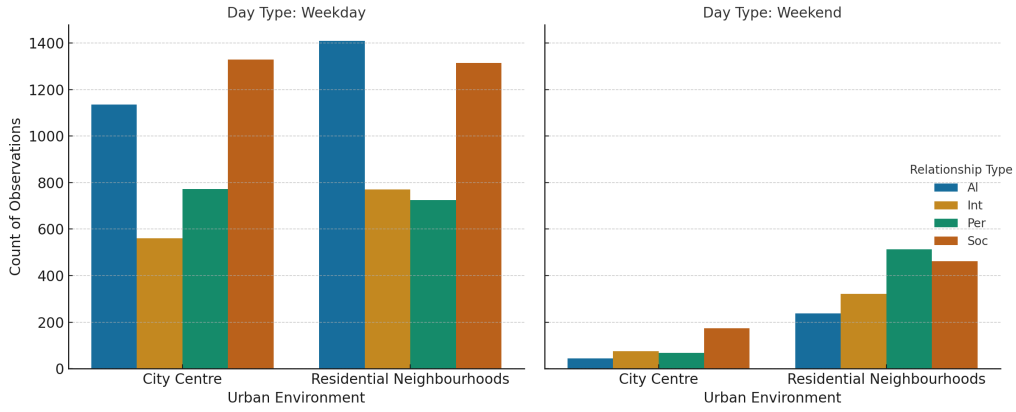


Figure 6.4: Social Relationship Typology (i.e., alone, intimate, personal, social) by Urban Environment and Day Type

on weekends, consistent with transient, heterogeneous urban flows. Although exploratory, these findings are supported by adequate segment sample sizes (Appendix H) confirm these patterns provide a solid descriptive foundation for the later, more detailed analyses.

Overall, these results reflect the fallacy of treating well-designed public spaces as inherently egalitarian: participation and behaviour are unevenly distributed, with dominant groups (for example, anti-social youth in city-centre streets) effectively crowding out more vulnerable populations (such as women or older adults) despite identical physical settings. Such patterns, documented in socio-ecological studies of urban environments (Cheshmehzangi & Heat, 2012; Enssle & Kabisch, 2020), indicate that public-space use is a product of dynamic socio-environmental processes, not merely spatial form. Conventional aggregate analyses (Amin, 2002; Mehta, 2019b) gloss over these exclusionary dynamics, and reductionist spatial-behaviour models fail to predict who actually inhabits which corners, at what times.

Therefore, to address these uneven participation patterns, adopting a segmentation strategy that systematically integrates temporal rhythms and spatial hierarchies is essential (J. Wu, 1999). This approach not only aligns with social-ecological perspectives on urban space (X. Guo et al., 2022) but also ensures reliable, context-sensitive interpretation of user group presence and behavioural patterns. The conceptual foundation of segmentation strategy, detailed rationale, and methodological implementation are presented in the methodology chapter (Section 3.7).

6.3 Behaviour Pattern and Group Presence

6.3.1 Cluster Overview by User Group Presence

To support segmentation of public space user groups, three clusters ($k = 3$) were retained for each user group dimension. The selection was based on the elbow method, which examines the trade-off between model complexity and explanatory power. As shown in Figure 6.5, the within-cluster sum of squares (WCSS) curves for all five dimensions, Ethnicity, Life Stage, Gender, Social Relationship Typology, and Social Interaction Typology, exhibit a marked inflection at $k = 3$. This point reflects the point of diminishing returns, where increasing the number of clusters adds minimal explanatory value. The consistent convergence across all dimensions supports the choice of three clusters as both statistically appropriate and analytically coherent for comparative interpretation across user group characteristics (Kodinariya, Makwana, et al., 2013).

Following this, five PCA–k-means clustering analyses were conducted, each focusing

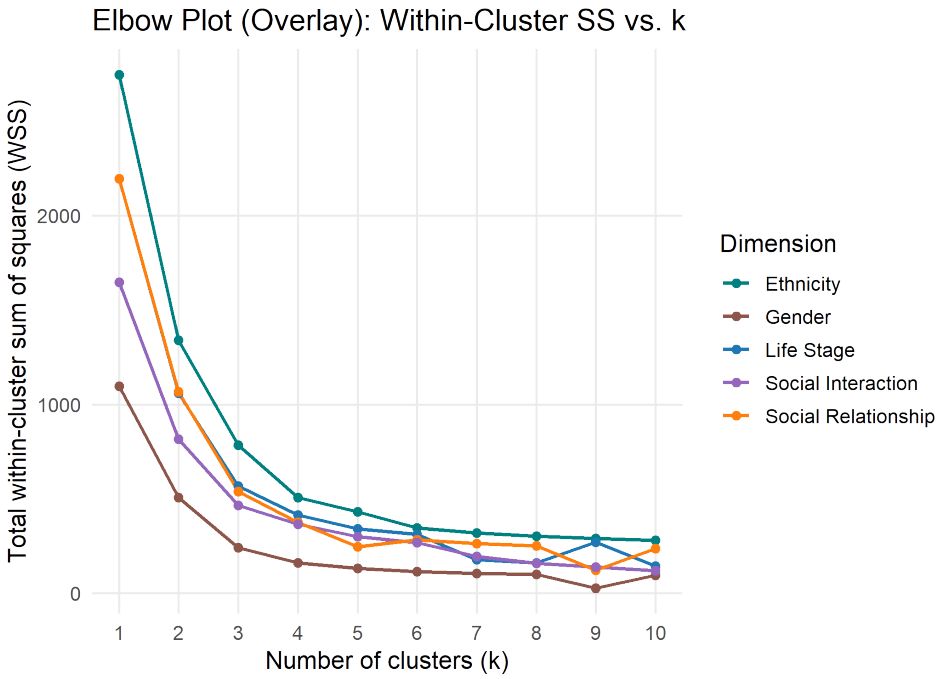
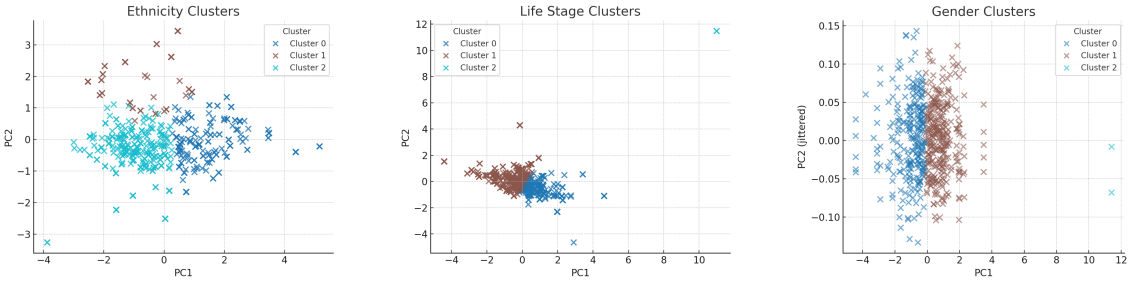


Figure 6.5: Elbow plot showing within-cluster sum of squares (WCSS) for cluster counts $k = 1$ to $k = 10$ across five PCA models.

on one dimension of user composition: Ethnicity (Figure 6.6a), Life Stage (Figure 6.6b), Gender (Figure 6.6c), Social Relationship Typology, and Social Interaction Typology (Figure 6.7). The resulting clusters provide a structured basis for understanding the composition of observed user groups. Table 6.2 summarises the category proportions within each cluster, highlighting shared traits and divergences across the five dimensions.



(a) Ethnicity (b) Life Stage (c) Gender

Figure 6.6: PCA-Reduced Segment Space for Clusters by Ethnicity, Life Stage, and Gender

6.3.2 Criteria for Cluster Selection and Analytical Focus

Within each clustering solution, a limited number of clusters were selected for further analysis based on their distinctive behavioural, demographic, and spatial–temporal

Table 6.2: Composition of PCA-Derived Clusters by User Group Type

Cluster Group	**Cluster**	**n**	**User Group Composition (%)**
Ethnicity	Cluster 0	276	White (E3): 64.7, Asian (E1): 15.4, Southeast Asian (E4): 12.4, Black (E2): 6.6, Mixed (E5): 1.0
	Cluster 1	209	White (E3): 79.7, Asian (E1): 9.4, Southeast Asian (E4): 6.1, Black (E2): 4.0, Mixed (E5): 0.8
	Cluster 2	65	White (E3): 67.5, Asian (E1): 12.6, Southeast Asian (E4): 10.4, Black (E2): 6.4, Mixed (E5): 3.0
Life Stage	Cluster 0	308	Adults(Ls3): 77.2, Elderly(Ls4): 13.7, Toddlers(Ls1): 7.0, Young Adolescents(Ls2): 2.1
	Cluster 1	240	Adults(Ls3): 67.5, Elderly(Ls4): 21.7, Toddlers(Ls1): 7.2, Young Adolescents(Ls2): 3.5
	Cluster 2	2	Adults(Ls3): 0.0, Elderly(Ls4): 0.0, Toddlers(Ls1): 0.0, Young Adolescents(Ls2): 100.0
Gender	Cluster 0	113	Female (G1): 44.4, Male (G2): 55.6
	Cluster 1	155	Female (G1): 58.2, Male (G2): 41.8
	Cluster 2	282	Female (G1): 51.6, Male (G2): 48.4
Social Relationship Typology	Cluster 0	126	Alone: 19.1, Social: 29.8, Personal: 33.9, Intimate: 17.3
	Cluster 1	141	Alone: 24.8, Social: 41.8, Personal: 15.0, Intimate: 18.4
	Cluster 2	283	Alone: 34.8, Social: 29.6, Personal: 18.3, Intimate: 17.3
Social Interaction Typology	Cluster 0	141	Enduring: 82.5, Passive: 16.9, Fleeting: 0.6
	Cluster 1	387	Enduring: 66.4, Passive: 32.4, Fleeting: 1.2
	Cluster 2	22	Enduring: 62.5, Passive: 29.4, Fleeting: 8.1

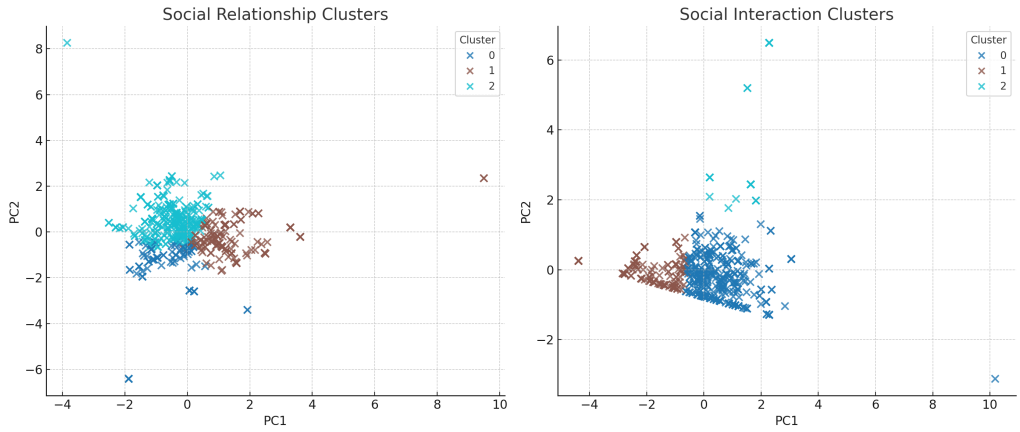


Figure 6.7: Social Relationship and Interaction Clusters in PCA-Reduced Segment Space

characteristics. This selection was not arbitrary, but grounded in a criterion of analytical salience, defined as a cluster's meaningful deviation from others in terms of user group composition (e.g., gendered, life-stage, or ethnic concentration), activity rhythm (e.g., temporal regularity or peak-use patterns), or locational specificity (e.g., consistent spatial occurrence across public space types or urban settings). These dimensions were evaluated in relation to the thesis's conceptual framework, which prioritises the interaction between spatial design, social diversity, and behavioural ecology. While all cluster outputs were reviewed, only those demonstrating theoretically significant or empirically consistent patterns were retained for spatial–temporal analysis. This approach ensures interpretive clarity and prevents dilution of findings by avoiding overgeneralisation. Moreover, it responds to established practice in behavioural mapping and urban informatics, where cluster interpretability and behavioural distinctiveness are treated as key indicators of explanatory utility (Aelbrecht, 2016; X. Guo et al., 2022; Mehta, 2009).

The following analyses focus on these selected clusters to explore how user group composition and activity patterns interact with spatial settings and temporal rhythms.

- **Ethnicity Cluster 0: Minority–Majority Composition** — Elevated shares of *E1 (Asian)* (15.4%) and *E4 (Southeast Asian)* (12.4%), reflecting diverse minority–majority mixes often absent from more homogeneous White-majority segments.
- **Life Stage Cluster 1: Intergenerational Presence** — Co-presence of LS1 (toddlers) and LS4 (elderly), suggesting intergenerational use patterns, particularly in quiet, legible spaces.
- **Social Interaction Cluster 0: Anchored Engagement** — Dominated by *Enduring Sociability* (82.5%), with *Passive Sociability* (16.9%) and negligible

Fleeting Sociability (0.6%), suggesting settings that foster trust, mutual recognition, and shared routines, while reducing the likelihood of purely incidental encounters.

- **Social Relationship Cluster 0: Personal–Social Mix** — Balanced representation of personal and social ties, indicating segments that support active relational use beyond solitary or intimate configurations.
- **Social Relationship Cluster 2: Solitude in Public** — High presence of alone users, showing how public spaces enable solitude even amid collective presence, fostering a balance between personal reflection and communal urban life (Komac, 2016).

6.3.3 Segment Distribution Across Space and Time by Clusters

To determine whether the clusters correspond to meaningful contextual variation, each of the 15 clusters was analysed across spatial and temporal contexts. Specifically, we examined distribution patterns by public space and their types, urban environment type, distance to city centre, day type, and season.

Table 6.3: Cluster Segment Distribution by Named Public Spaces

Cluster	Botanical Gardens	Division Street	Ecclesall Road	Peace Gardens	Western Bank Park
cluster_ethnicity_0	0.4	13.8	0.0	9.8	7.2
cluster_ethnicity_1	16.7	0.5	14.4	1.4	1.0
cluster_ethnicity_2	0.0	3.1	9.2	6.2	15.4
cluster_life_stage_0	3.6	12.0	4.9	3.2	10.1
cluster_life_stage_1	10.4	1.7	8.8	10.0	0.0
cluster_life_stage_2	0.0	0.0	0.0	0.0	50.0
cluster_gender_0	20.6	0.0	5.2	1.3	12.3
cluster_gender_1	0.0	23.9	1.8	13.3	0.0
cluster_gender_2	1.4	5.0	9.2	6.0	4.6
cluster_relationship_0	0.7	20.6	3.5	4.3	5.7
cluster_relationship_1	10.3	5.6	4.0	4.8	7.9
cluster_relationship_2	7.8	1.8	9.2	7.8	4.9
cluster_interaction_0	9.2	9.2	2.8	2.1	11.3
cluster_interaction_1	5.9	6.5	7.5	8.0	4.1
cluster_interaction_2	0.0	13.6	13.6	0.0	0.0

Marginalisation Clusters

- **Ethnicity Cluster 0** (Asian & Southeast Asian): This cluster appears disproportionately in *City Centre* settings such as *Peace Gardens* and *Division Street*, while being underrepresented in residential neighbourhood locations including *Ecclesall Road* and *Botanical Gardens* (Figure 6.8). From a socio-ecological perspective, such spatial concentration suggests that central public

Table 6.4: Cluster Segment Distribution by Urban Spatial Type

Cluster	Streets	Public Open Space	Residential Neighbourhood	City Centre
cluster_ethnicity_0	9.8	7.6	0.4	15.9
cluster_ethnicity_1	6.2	11.0	18.7	1.0
cluster_ethnicity_2	12.3	9.2	3.1	10.8
cluster_life_stage_0	11.4	6.2	4.2	12.3
cluster_life_stage_1	5.4	12.9	12.1	6.2
cluster_life_stage_2	0.0	0.0	0.0	0.0
cluster_gender_0	1.3	13.5	12.9	1.9
cluster_gender_1	11.5	5.3	0.0	14.2
cluster_gender_2	11.7	8.2	7.8	12.1
cluster_relationship_0	17.0	2.8	1.4	13.5
cluster_relationship_1	5.6	12.7	6.3	10.3
cluster_relationship_2	6.0	10.6	11.3	7.4
cluster_interaction_0	7.8	11.3	5.7	7.8
cluster_interaction_1	8.5	8.8	8.3	10.3
cluster_interaction_2	18.2	0.0	9.1	9.1

Table 6.5: Cluster Segment Distribution by Distance to City Centre

Cluster	0.5 km	1 km	2 km
cluster_ethnicity_0	15.6	7.2	0.4
cluster_ethnicity_1	0.5	1.0	18.7
cluster_ethnicity_2	4.6	15.4	3.1
cluster_life_stage_0	8.1	10.1	4.2
cluster_life_stage_1	9.2	0.0	12.1
cluster_life_stage_2	0.0	50.0	0.0
cluster_gender_0	0.6	12.3	12.9
cluster_gender_1	23.9	0.0	0.0
cluster_gender_2	6.7	4.6	7.8
cluster_relationship_0	14.2	4.3	1.4
cluster_relationship_1	6.3	10.3	6.3
cluster_relationship_2	6.7	4.6	11.3
cluster_interaction_0	5.7	11.3	5.7
cluster_interaction_1	9.6	4.1	8.3
cluster_interaction_2	9.1	0.0	9.1

Table 6.6: Cluster Segment Distribution by Temporal Grouping

Cluster	**Weekday**	**Weekend**	**Autumn**	**Spring**	**Summer**	**Winter**
cluster_ethnicity_0	14.0	10.0	10.8	2.8	5.6	4.8
cluster_ethnicity_1	15.1	1.0	1.0	15.1	0.0	0.0
cluster_ethnicity_2	9.2	10.8	7.7	3.1	6.6	2.6
cluster_life_stage_0	10.4	9.5	7.1	3.8	4.7	4.7
cluster_life_stage_1	9.2	9.2	9.2	3.3	0.4	5.4
cluster_life_stage_2	0.0	0.0	0.0	0.0	0.0	0.0
cluster_gender_0	13.5	0.6	0.0	0.0	0.6	12.9
cluster_gender_1	11.5	0.0	0.0	0.0	5.3	0.0
cluster_gender_2	12.8	6.9	5.2	4.9	5.4	1.8
cluster_relationship_0	14.2	4.3	2.8	0.0	3.3	2.4
cluster_relationship_1	10.3	6.3	7.5	1.1	5.2	3.0
cluster_relationship_2	7.4	9.4	6.3	2.6	7.2	1.8
cluster_interaction_0	5.7	5.7	11.3	0.0	5.7	0.0
cluster_interaction_1	6.5	10.2	8.3	2.4	4.6	1.3
cluster_interaction_2	9.1	9.1	9.1	0.0	0.0	9.1

spaces function as relatively open, symbolically neutral arenas where minority groups can occupy space without breaching entrenched social boundaries. Conversely, the lower presence in residential neighbourhoods may indicate the persistence of subtle exclusionary mechanisms, such as limited cultural representation in programming, perceived lack of welcome, or historically embedded socio-spatial segregation, that constrain use (Peters & de Haan, 2011; Simmel, 2009). This interpretation is consistent with studies showing that visible diversity in urban cores often masks reduced access to everyday neighbourhood spaces for ethnic minorities.

- **Social Relationship Cluster 2** (Alone): Most frequently observed in public open spaces within residential neighbourhoods, particularly during Autumn and Summer (Tables 6.6 and 6.3). While solitude in public space is not inherently exclusionary, the recurrent seasonal and locational pattern here suggests a form of *ambient marginalisation*, where individuals are physically present but socially peripheral. This aligns with the concept of "being alone together" (Coleman, 2009), in which people share spatial proximity without social engagement. In the context of residential neighbourhoods, such patterns may indicate either intentional withdrawal (valuing privacy in familiar settings) or constrained opportunity for interaction due to the prevailing relational norms, activity patterns, or socio-demographic composition of those spaces.

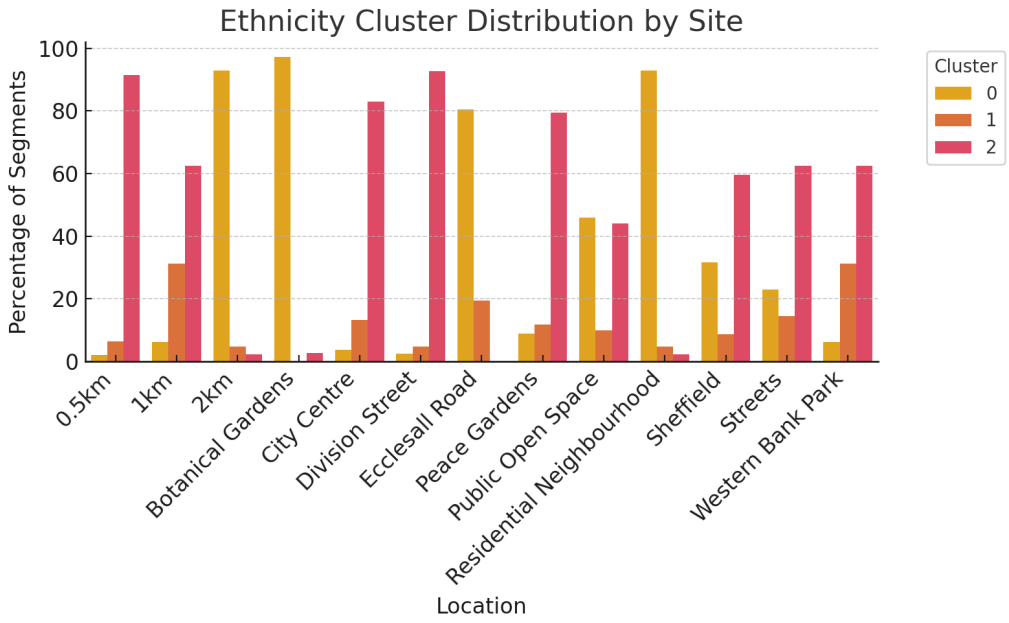


Figure 6.8: Ethnicity Cluster distribution by site.

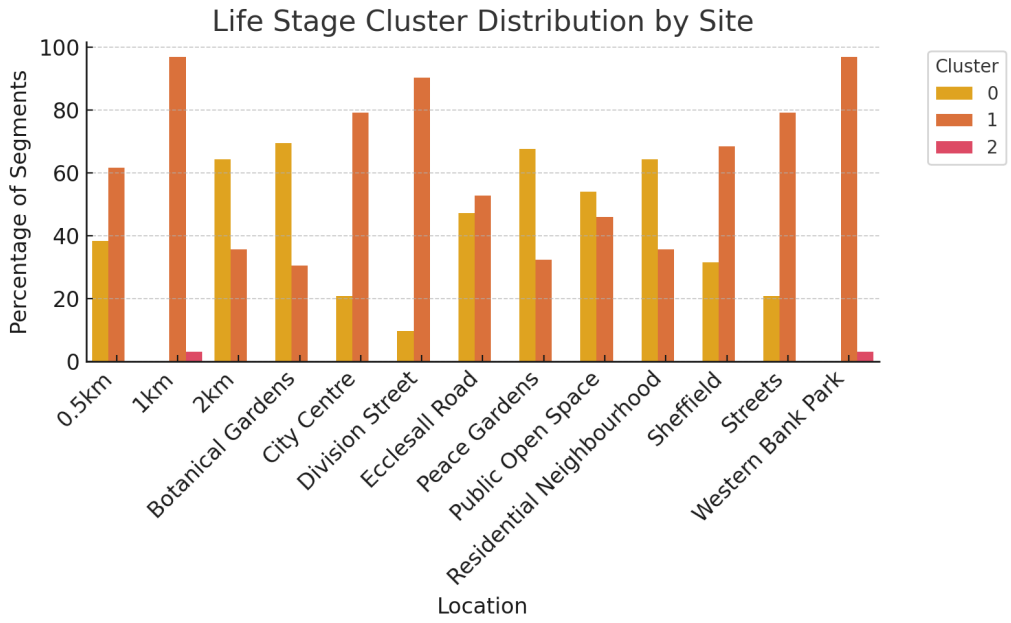


Figure 6.9: Life Stage Cluster distribution by site.

Co-Presence Clusters

- **Life Stage Cluster 1** (toddlers & elderly): Common in family-oriented, legible settings such as *Western Bank Park*, and in locations within close proximity to the city centre (Figure 6.9). These spaces support age-diverse co-presence through visibility, accessibility, and ambient surveillance (Askarizad et al., 2024; Peace et al., 2013).

- **Social Interaction Cluster 0** (Enduring-dominant): Concentrated in the Botanical Gardens and Western Bank Park (public open spaces in residential neighbourhoods) and present on Division Street (city centre) (Figure 6.9). These environments support social anchoring through spatial legibility, comfort, and amenities that enable prolonged presence, fostering deeper relational bonds. Temporally, the pattern peaks in autumn but is evenly distributed across weekdays and weekends (Table 6.6), indicating consistent social integration rather than event-driven or marginalised use. Such stability aligns with the social-ecological principle that predictable, affordance-rich settings enable enduring relationships that reinforce community cohesion (Simmel, 2009).

- **Social Relationship Cluster 0** (personal/social ties): Predominantly observed on streets, particularly where walking and lingering are supported. However, it was surprising that the cluster was most predominant on weekdays (Table 6.6). This weekday concentration likely reflects the structured social rhythms of everyday mobility, where streets function as *transit-social spaces* that support incidental encounters during commuting, school runs, and

local errands. The presence of micro-affordances such as shopfronts, seating, and sheltered thresholds facilitates short but meaningful exchanges, reinforcing ongoing personal and social ties in the course of daily life. By contrast, weekends tend to redistribute such interactions toward leisure-oriented destinations, shifting activity away from street environments. This pattern reinforces the idea that sociability is spatially enabled and temporally patterned (Gehl, 2011; Korllos, 1994; Mehta, 2009).

These findings show that the identified clusters are not random statistical artefacts but correspond to ecological patterns of urban public life. Marginalised user group clusters appear spatially and temporally constrained, concentrated in city centre locations (Trawalter et al., 2021). In contrast, co-presence clusters exhibit broader spatial dispersion and seasonal amplification, particularly in environments that afford sociability, multigenerational access, and informal interaction.

These findings demonstrate that both behavioural patterns and user group compositions are context-dependent phenomena, not static attributes. They emerge from the situated interplay between spatial configurations, temporal rhythms, and what we term the relational ecologies of presence, structured co-presence formations shaped by clustering across demographic, social relationship, and interactional dimensions.[2] These findings strongly support theoretical perspectives from environmental psychology and urban sociology (Kyttä et al., 2018), which posit space as a relational filter. Public spaces are not merely containers; they actively structure opportunities for visibility, safety, and engagement. The observed patterned variation across space and identity vividly illustrates that public space functions as a socio-spatial ecology, where demographic presence and behavioural tendencies co-evolve, thereby influencing the inclusivity and social vibrancy of urban life.

6.4 Conclusion and Implications

In this chapter, we develops a novel spatial-temporal segmentation framework to explore how public space use is structured through the situated interplay of demographic composition, social relationality, and behavioural configurations. Informed by the ecological-social lens introduced in Chapter 2 and responding directly to RQ 2, the analysis moves beyond location-based or individualised approaches to reveal *relational ecologies of presence*, co-presence formations that emerge contextually across spatial settings and temporal rhythms. Through clustering techniques

[2] "Relational ecologies" refers to the patterned co-occurrence of user group characteristics (e.g., Alone, Social, Personal) and their clustering in specific segments, capturing both interpersonal dynamics and broader population-level configurations shaped by spatial affordances and constraints (Lawrence, 2010; Lawton & Nahemow, 1973).

applied to demographic attributes (life stage, gender, ethnicity) and relational patterns (interaction and social relationship typologies), the study identifies distinctive segment-level patterns. For example, intergenerational co-use in public open spaces, the spatial centrality of Asian and Southeast Asian users, and weekdend solitude among users observed alone in open public areas. These findings reflect how inclusion and marginalisation unfold through everyday configurations of visibility, participation, and accessibility in public space.

Methodologically, the segmentation-led strategy constitutes a key contribution of this research. By treating spatio-temporal segments as the unit of analysis and layering multidimensional user group data onto them, the chapter avoids premature generalisation while generating mid-level interpretive profiles that hold theoretical and practical value. These cluster profiles do not aim to produce predictive generalisations but rather reveal situated regularities that are theoretically informative and practically actionable. Such findings would be flattened or obscured under undifferentiated, aggregate-level analyses, which often fail to capture the relational specificity and contextual embeddedness of social behaviour in urban environments (Hsia, 1988; Winkel et al., 2009b). By foregrounding configured variation rather than averaged trends, this research provides a more nuanced, ecologically valid understanding of how public spaces function as arenas for differentiated social presence and interaction (Langen, 1969).

From an urban informatics perspective, the behavioural mapping framework and segmentation strategy developed in this study exemplify how spatial–temporal segmentation and multidimensional user group profiling can be systematically embedded within post-occupancy evaluation protocols for public space. By operationalising co-presence patterns, demographic visibility, and relational configurations at fine spatial and temporal resolutions, the approach extends the evaluative capacity of post-occupancy studies beyond the limitations of perception-only audits. Grounded in the hierarchical thinking of urban ecology and the socio-ecological models of environmental psychology (Lawton & Nahemow, 1973; F. Wu, 2000; J. Wu, 1999), this method enables public space vitality, inclusivity, and equity to be assessed through reproducible, evidence-based indicators. These indicators allow local authorities, urban designers, and policy teams to identify spatial segments that underperform, diagnose the structural or relational constraints underlying those patterns, and monitor longitudinal change in response to targeted design interventions or policy reforms.

Our findings lay the empirical foundation for the survey-based analysis that follows. While the present study elucidates *how* different user groups manifest and interact within urban public spaces, mapping the ecological distribution of behaviours across

spatial and temporal contexts, the subsequent chapter shifts focus to explore *why* such patterns arise, engaging with individual-level perceptions, experiences, and values. This methodological progression marks a deliberate transition from ecological structure to psychosocial meaning-making, enabling a multi-scalar understanding of public space as both a material interface and a socially mediated domain. Together, these complementary studies construct a coherent and empirically grounded account of how urban environments shape, and are shaped by, processes of social cohesion.

Chapter 7

Survey Study Findings

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7.1 Introduction

In the previous chapter (Chapter 6), we developed and applied a spatial–temporal segmentation framework to examine how public space use is structured through the interplay of demographic composition, social relationality, and behavioural configurations. These findings established the social-ecological structure of public space use, *who* is present, *with whom*, *where*, and *when*, providing an empirically grounded map of the social terrain on which further processes unfold.

Building directly on this foundation, the present chapter shifts focus from observable patterns of use to the psychosocial mechanisms through which cohesion is subjectively experienced and expressed. This is both a methodological and conceptual transition. While spatial–behavioural mapping captures how public space is occupied and enacted, it does not explain how these encounters are internalised, evaluated, or translated into a sense of belonging, trust, or inclusion. Here, we address Research Question 3: *How do public space characteristics, social interaction, and individual perceptions interact to shape social cohesion?* The aim is to examine how spatial, demographic, behavioural, and perceptual conditions combine to produce, condition, or constrain cohesive outcomes across contrasting urban contexts.

The psychosocial lens applied in this chapter draws from established scholarship in environmental psychology and urban sociology, recognising that spatial experience is jointly determined by physical affordances, affective meaning, and social identity (S. Low & Smith, 2006; Scannell & Gifford, 2010). Spatial features may afford opportunities for contact, but whether these affordances are realised as inclusive experiences depends on how individuals perceive and inhabit the setting. This captures the situational conditions through which the potential of public space is either activated or diminished.

We apply two analytical strategies. Moderation models test whether the influence of spatial features on cohesion varies by demographic or perceptual factors. Mediation models assess whether forms of social interaction act as pathways linking design to psychosocial outcomes. Together, these analyses operationalise the psychosocial dimension of the framework (Chapter 2), allowing us to identify *for whom*, *under what conditions*, and *through which processes* cohesion emerges.

This modelling strategy reflects the broader interest in conditionality and process: for whom do spatial features matter, under what perceptual conditions, and through which behavioural mechanisms does cohesion take shape? Whereas the Behaviour Mapping study (Chapter 6) revealed patterns of co-presence and social interaction, this chapter provides a complementary account focused on how individuals interpret and evaluate their public space encounters. These findings also lay the empirical

foundation for Chapter8, which explores lived narratives of social cohesion in public spaces.

The chapter proceeds as follows. Section 7.2 presents sample characteristics and descriptive patterns. Section 7.3 details the moderation analysis, followed by mediation models in Section 7.4. Section 7.5 concludes by reflecting on the value of psychosocial modelling for understanding how public space shapes cohesion.

7.2 Descriptive Statistics

7.2.1 Sociodemographic Profile

The sample reflects a broad cross-section of urban residents. Most participants were aged 25–64, with younger adults (18–24) underrepresented. Gender distribution was balanced between male and female respondents, with negligible non-binary representation. Income levels skewed toward lower-middle and middle-income groups. Employment status was diverse: nearly half were in full-time work, while part-time and retired respondents made up comparable proportions. Although broadly representative, the sample showed slight overrepresentation of white respondents. These characteristics are taken into account where demographic variables are tested as moderators in the modelling framework. Table 7.1 summarises the distribution of respondents by age group, gender, income, employment status, and ethnicity

7.2.2 Key Variables by Urban Context

Participants rated city centre public space more positively on physical indicators such as landmarks, active frontages, and mixed-use integration. In contrast, social interaction was reported more frequently in residential settings, indicating a more routine, embedded nature of local encounters. These patterns inform the modelling strategy by justifying environmental disaggregation and provide contextual grounding for interpreting psychosocial variation across settings. Table 7.2 reports descriptive statistics (means and standard deviations) for physical characteristics and interaction frequencies across both contexts.

7.2.3 Correlation Overview

This section explores the correlational structure among core constructs, including the physical and perceptual attributes of public space, social interaction (behavioural outcome variables), and social cohesion (perceptual outcome variables), disaggregated across city centre and residential neighbourhood contexts. Rather than serving solely as a statistical pre-check, these correlations are theoretically driven since

Table 7.1: Sociodemographic Characteristics of Survey Respondents

Category	Variable	Count (n)	Percentage (%)
Age	45–64	240	39.09
	25–44	203	33.06
	65–79	101	16.45
	18–24	66	10.75
	80+	4	0.65
Gender	Female	315	51.30
	Male	297	48.37
	Prefer not to say	2	0.33
Income Level	Lower-middle	335	54.56
	Low	146	23.78
	Upper-middle	128	20.85
	High	5	0.81
Employment Status	Full-time	290	47.23
	Part-time	110	17.92
	Retired	109	17.75
	Student	32	5.21
	Homemaker	31	5.05
	Unemployed	23	3.75
	Other	19	3.09
Ethnicity	White	484	78.83
	Asian	44	7.17
	Other	23	3.75
	Black	22	3.58
	Mixed	20	3.26
	Empty	16	2.61
	Consent Revoked	5	0.81

Table 7.2: Descriptive Statistics: Perceived Public Space Characteristics and Social Interaction Frequencies

Context	Variable	Mean	SD
City Centre	Landmarks & Place Identity	4.36	0.78
	Pedestrian Design Affordances	3.83	0.81
	Active Frontages	4.10	0.87
	Mixed Use Integration	3.90	0.93
	Spatial Maintenance & Safety	3.42	1.06
	Passive Sociability	2.07	1.13
	Fleeting Sociability	1.89	1.13
	Enduring Sociability	2.16	1.07
Residential Neighbourhood	Landmarks & Place Identity	4.15	1.16
	Pedestrian Design Affordances	3.45	1.09
	Active Frontages	3.57	1.12
	Mixed Use Integration	3.46	1.16
	Spatial Maintenance & Safety	3.45	1.11
	Passive Sociability	2.49	1.32
	Fleeting Sociability	2.43	1.31
	Enduring Sociability	2.43	1.19

they provide empirical grounding and support the plausibility of the hypothesised psychosocial pathways that underpin urban social cohesion (Leyland & Groenewegen, 2020; Qi et al., 2024; Wan et al., 2021). Following environmental psychology conventions (Francis et al., 2012; Liu et al., 2020), this step establishes foundational coherence among the variables prior to the moderation and mediation analyses that follow.

Table 7.3: Correlation Matrix of Spatial-Perceptual Variables and Social Cohesion Variables.

	Q25	Q26	Q27	Q28	Q29
Q5	0.07**	0.09**	0.08**	0.14**	0.17**
Q6	0.16**	0.16**	0.12**	0.16**	0.20**
Q7	0.05**	0.14**	0.15**	0.13**	0.19**
Q8	0.14**	0.12**	0.12**	0.12**	0.13**
Q9	0.15**	0.17**	0.10**	0.15**	0.20**
Q10	0.23**	0.15**	0.14**	0.16**	0.11**
Q11	0.31**	0.28**	0.23**	0.24**	0.20**
Q12	0.32**	0.23**	0.23**	0.27**	0.17**
Q13	0.18**	0.18**	0.18**	0.17**	0.17**
Q14	0.16**	0.21**	0.20**	0.20**	0.24**
Q15	0.10**	0.18**	0.17**	0.15**	0.13**
Q16	0.17**	0.18**	0.19**	0.17**	0.15**
Q17	0.19**	0.21**	0.23**	0.23**	0.21**
Q18	0.30**	0.25**	0.23**	0.27**	0.24**
Q19	0.43**	0.39**	0.35**	0.41**	0.37**
Q20	0.39**	0.32**	0.32**	0.32**	0.28**
Q21	0.10**	0.17**	0.12**	0.15**	0.14**
Q22	0.06**	0.17**	0.15**	0.20**	0.17**
Q23	0.15**	0.18**	0.21**	0.25**	0.19**
Q24	0.25**	0.32**	0.32**	0.35**	0.29**
Q25	1	0.71**	0.60**	0.62**	0.57**
Q26		1	0.68**	0.70**	0.62**
Q27			1	0.75**	0.60**
Q28				1	0.68**
Q29					1

Note: Coefficients marked with ** indicate statistical significance at both 0.1% and 1% level. The matrix is symmetric, and only the upper triangle is displayed for clarity.

To avoid redundancy and visual overload, Table 7.3 presents the cross-construct relationships in terms of social cohesion outcomes, while full matrices (including all inter-variable correlations) are available in Appendices I. All included measures are structured by construct and operationalised through specific survey items, as detailed in Table 3.6, which maps each analytical construct to its corresponding survey question and contextual application. The findings confirm the absence of multicollinearity, no correlation exceeds r = .75, and reveal theoretically consistent

clustering patterns, such as strong intra-cohesion correlations and positive linkages between spatial qualities, social interactions, and perceived cohesion. These results reflect findings in prior urban studies (Dempsey, 2008; Mouratidis & Poortinga, 2020), which highlight how place affordances and social encounters shape belonging and trust. Overall, the correlational patterns support the analytical logic of the study. Moderation models examine how perceptual and sociodemographic factors condition the effects of public space on cohesion, while mediation models test whether social interaction serves as a psychosocial pathway linking spatial attributes to cohesion outcomes.

7.3 Moderation Analysis

7.3.1 Overview of Moderation Analysis Results

This section presents the results of the moderation analysis, which examined whether the relationships between public space characteristics (independent variables, IVs) and social outcomes (dependent variables, DVs) were conditioned by individual-level perceptual or sociodemographic factors (moderators).

A total of 720 moderation models were estimated, 360 models per urban context (residential neighbourhood and city centre), testing all possible combinations of five spatial design variables, three forms of social interaction, five social cohesion outcomes, and nine moderators. Of these, 66 models (approximately 9.2%) yielded statistically significant interaction effects. Specifically:

- **30 significant models** were identified in the *residential neighbourhood* context (Table 7.4);
- **36 significant models** were found in the *city centre* context (Table 7.5).

The results reported below highlight the most conceptually and practically relevant interactions. These were selected based on theoretical salience, clarity of effect direction, and consistency across outcome types. The presentation in this section follows an outcome-centred synthesis strategy, grouping results thematically by dependent variable category (social interaction and social cohesion) to support interpretability and reduce cognitive overload.

7.3.2 Moderation Analysis: Residential Neighbourhood

As outlined earlier, moderation models test whether spatial–social associations vary systematically by individual characteristics or subjective perceptions. This section focuses on identifying *for whom* and *under what psychosocial conditions* public space

Table 7.4: Significant moderating effects of the socio-demographic and perceptual factors in public spaces located in residential neighbourhood context.

Moderator Variable	**Dependent Variable**	**Independent Variable**	**Interaction Coefficient**	**95% CI**	**R^2**
Perception of Safety	Place attachment	Landmarks & Place Identity (RN)	-0.080**	[-0.155, -0.005]	0.057
Perception of Familiarity	Place attachment	Spatial Maintenance & Safety (RN)	0.076**	[0.002, 0.151]	0.094
	Enduring Sociability (RN)	Spatial Maintenance & Safety (RN)	0.096**	[0.011, 0.180]	0.067
	Social network	Spatial Maintenance & Safety (RN)	0.107***	[0.027, 0.188]	0.066
	Fleeting Sociability (RN)	Active Frontages (RN)	0.113**	[0.022, 0.203]	0.033
Perception of Comfort	Social inclusion	Active Frontages (RN)	-0.125***	[-0.206, -0.043]	0.064
	Social inclusion	Pedestrian Design Affordances (RN)	-0.088**	[-0.167, -0.008]	0.063
	Social inclusion	Landmarks & Place Identity (RN)	-0.106***	[-0.183, -0.028]	0.057
	Social network	Active Frontages (RN)	-0.085**	[-0.169, -0.002]	0.029
Perception of Belonging	Enduring Sociability (RN)	Pedestrian Design Affordances (RN)	0.099**	[0.013, 0.184]	0.089
	Enduring Sociability (RN)	Spatial Maintenance & Safety (RN)	0.106**	[0.024, 0.189]	0.069
	Passive Sociability (RN)	Mixed Use Integration (RN)	0.122***	[0.034, 0.210]	0.044
	Enduring Sociability (RN)	Active Frontages (RN)	0.091**	[0.008, 0.174]	0.040
Income Level	Social capital or trust	Pedestrian Design Affordances (RN)	0.142**	[0.026, 0.259]	0.066
	Social inclusion	Landmarks & Place Identity (RN)	0.124**	[0.018, 0.230]	0.040
Gender	Fleeting Sociability (RN)	Spatial Maintenance & Safety (RN)	0.258***	[0.082, 0.435]	0.042
	Social inclusion	Active Frontages (RN)	0.151**	[0.001, 0.302]	0.039
	Place attachment	Active Frontages (RN)	0.151**	[0.009, 0.293]	0.037
	Sense of community	Active Frontages (RN)	0.179**	[0.029, 0.329]	0.033
	Social capital or trust	Active Frontages (RN)	0.187**	[0.042, 0.332]	0.027
	Social network	Active Frontages (RN)	0.181**	[0.028, 0.335]	0.020
Ethnicity	Place attachment	Landmarks & Place Identity (RN)	0.055***	[0.013, 0.097]	0.043
	Sense of community	Landmarks & Place Identity (RN)	0.045**	[0.001, 0.089]	0.036
	Fleeting Sociability (RN)	Pedestrian Design Affordances (RN)	0.064**	[0.011, 0.118]	0.031
Employment Status	Social inclusion	Pedestrian Design Affordances (RN)	-0.047**	[-0.086, -0.009]	0.052
Age	Social capital or trust	Spatial Maintenance & Safety (RN)	0.155***	[0.074, 0.237]	0.126
	Place attachment	Spatial Maintenance & Safety (RN)	0.103**	[0.020, 0.185]	0.070
	Sense of community	Spatial Maintenance & Safety (RN)	0.144***	[0.057, 0.231]	0.067
	Enduring Sociability (RN)	Spatial Maintenance & Safety (RN)	0.096**	[0.003, 0.188]	0.063
	Social capital or trust	Mixed Use Integration (RN)	0.086**	[0.010, 0.162]	0.032

Note: *, **, and *** represent significance at the 10%, 5%, and 1% levels, respectively.

Table 7.5: Significant moderating effects of the socio-demographic and perceptual factors in public spaces located in city centre context.

Moderator Variable	Dependent Variable	Independent Variable	Interaction Coefficient	95% CI	R^2
Perception of Safety	Passive Sociability (CC)	Landmarks & Place Identity (CC)	0.136**	[0.017, 0.256]	0.016
	Fleeting Sociability (CC)	Active Frontages (CC)	0.160***	[0.061, 0.260]	0.022
	Fleeting Sociability (CC)	Mixed Use Integration (CC)	0.159***	[0.041, 0.276]	0.023
	Enduring Sociability (CC)	Active Frontages (CC)	0.110**	[0.015, 0.205]	0.015
	Enduring Sociability (CC)	Mixed Use Integration (CC)	0.124**	[0.013, 0.235]	0.036
Perception of Familiarity	Passive Sociability (CC)	Landmarks & Place Identity (CC)	0.187***	[0.056, 0.318]	0.017
	Passive Sociability (CC)	Mixed Use Integration (CC)	0.131**	[0.026, 0.235]	0.025
	Fleeting Sociability (CC)	Landmarks & Place Identity (CC)	0.140**	[0.009, 0.271]	0.012
	Fleeting Sociability (CC)	Spatial Maintenance & Safety (CC)	0.096**	[0.014, 0.179]	0.018
	Enduring Sociability (CC)	Pedestrian Design Affordances (CC)	0.117**	[0.015, 0.220]	0.029
	Sense of Community	Landmarks & Place Identity (CC)	-0.139**	[-0.264, -0.015]	0.088
Perception of Comfort	Social Network	Pedestrian Design Affordances (CC)	-0.122**	[-0.240, -0.004]	0.040
	Place Attachment	Pedestrian Design Affordances (CC)	-0.139**	[-0.249, -0.030]	0.043
Perception of Belonging	Passive Sociability (CC)	Mixed Use Integration (CC)	0.099**	[0.002, 0.197]	0.020
	Place Attachment	Landmarks & Place Identity (CC)	-0.132**	[-0.237, -0.027]	0.116
Income Level	Social Network	Spatial Maintenance & Safety (CC)	-0.124**	[-0.243, -0.005]	0.031
Gender	Passive Sociability (CC)	Mixed Use Integration (CC)	-0.183**	[-0.353, -0.013]	0.032
	Social Network	Active Frontages (CC)	0.321***	[0.118, 0.523]	0.018
	Social Network	Mixed Use Integration (CC)	0.261***	[0.090, 0.431]	0.034
	Social Network	Spatial Maintenance & Safety (CC)	0.174**	[0.011, 0.337]	0.030
	Social inclusion	Active Frontages (CC)	0.217**	[0.016, 0.417]	0.027
	Sense of Community	Active Frontages (CC)	0.227**	[0.029, 0.426]	0.028
	Social Capital or Trust	Mixed Use Integration (CC)	0.194**	[0.031, 0.357]	0.026
Ethnicity	Passive Sociability (CC)	Landmarks & Place Identity (CC)	0.085***	[0.024, 0.147]	0.017
	Passive Sociability (CC)	Mixed Use Integration (CC)	0.063**	[0.005, 0.121]	0.023
	Fleeting Sociability (CC)	Landmarks & Place Identity (CC)	0.064**	[0.002, 0.126]	0.007
	Fleeting Sociability (CC)	Active Frontages (CC)	0.061**	[0.007, 0.115]	0.009
	Social inclusion	Active Frontages (CC)	0.058**	[0.004, 0.111]	0.027
Employment Status	Passive Sociability (CC)	Spatial Maintenance & Safety (CC)	0.045**	[0.004, 0.085]	0.033
	Fleeting Sociability (CC)	Landmarks & Place Identity (CC)	0.078***	[0.024, 0.132]	0.019
Age	Passive Sociability (CC)	Spatial Maintenance & Safety (CC)	0.091**	[0.002, 0.180]	0.029
	Fleeting Sociability (CC)	Landmarks & Place Identity (CC)	0.160**	[0.035, 0.286]	0.013
	Place Attachment	Spatial Maintenance & Safety (CC)	0.106**	[0.022, 0.189]	0.027
	Sense of Community	Spatial Maintenance & Safety (CC)	0.118***	[0.030, 0.206]	0.032
	Social Capital or Trust	Mixed Use Integration (CC)	0.124**	[0.019, 0.228]	0.025
	Social Capital or Trust	Spatial Maintenance & Safety (CC)	0.149***	[0.065, 0.233]	0.057

Note: *, **, and *** represent significance at the 10%, 5%, and 1% levels, respectively.

design becomes socially consequential in residential neighbourhoods. Figure 7.1 summarises significant interactions across two categories of moderators.

Figure 7.1: Moderation Effects in the Residential Neighbourhood by Sociodemographic and Perceptual Factors.

Note: Heatmap displays interaction coefficients (b_3) from moderation models evaluating how sociodemographic (Age, Gender, Income Level) and perceptual (Comfort, Familiarity, Belonging) factors condition the relationships between public space features (IVs) and social outcomes (DVs). Rows represent unique Outcome ⟵ IV pairs. Only significant effects ($p < .05$) are shown; blank cells indicate non-significant interactions.

Key moderation patterns:

- **Sociodemographic moderators** revealed patterns of selective responsiveness:
  - *Gender* ($b = 0.151$ to 0.258) was the most consistent moderators. For instance, the positive association between *Active Frontages* and *Social Captial & Trust* was stronger among women ($b = 0.187$, $p < 0.05$).

  - *Age* showed strong moderation effects ($b = 0.086$ to 0.155), especially for *Spatial Maintenance & Safety*. The link between *Spatial Maintenance & Safety* and *Sense of Community* was more pronounced for older adults ($b = 0.144$, $p < 0.01$).

  - *Income Level* amplified the relationship between *Pedestrian Design Affordances* and *Social Captial & Trust* ($b = 0.142$, $p < 0.05$), indicating that lower-income participants benefitted more from well-maintained, secure settings.[1] This supports prior research on disparities in spatial confidence and safety perceptions (Sampson & Raudenbush, 1999; Ward Thompson et al., 2016).

- **Perceptual moderators** also influenced several design–outcome associations:

  - *Perception of Comfort* negatively moderated the relationship between *Pedestrian Design Affordances* and *Social Inclusion* ($b = -0.088$, $p < .05$), suggesting diminishing returns where comfort is already high.[2]

  - *Perception of Belonging* strengthened the link between *Mixed Use Integration* and *Passive Sociability* ($b = 0.122$, $p < .01$), indicating enhanced sociability when users feel a sense of belonging.

These patterns suggest identity-based differentiation in spatial experience, consistent with prior work on age- and gender-specific public space use (Cattell et al., 2008b; Chen et al., 2022).

These findings reinforce that design affordances depend on psychosocial experience. While self-reported, perceptual constructs capture meaningful appraisals that mediate behavioural responses. The results support a psychosocial model of spatial engagement, where spatial form interacts with perception and identity to shape social outcomes (Gifford, 2007; S. M. Low, 2000).

This analysis also provides a conceptual bridge to the next section. It raises the question of whether similar patterns hold in high-density contexts like the city centre, and prepares the ground for mediation analysis where the focus shifts from conditional variation to behavioural pathways linking design features and cohesion outcomes.

[1] Income was reverse-coded: lower values represent higher income, as clarified in the methodology chapter (Chapter 3). Positive moderation coefficients therefore reflect stronger effects among lower-income participants.

[2] This reflects a diminishing returns effect, where improvements in physical form yield smaller social benefits beyond a certain perceptual threshold. Similar dynamics have been observed in studies of walkability and safety perceptions (Ewing & Handy, 2009).

7.3.3 Moderation Analysis: City Centre

As shown in Figure 7.2, moderation effects in the city centre context clustered around behavioural outcomes including *Fleeting Sociability*, *Passive Sociability*, and *Enduring Sociability*. This contrasts with the residential setting, where effects were more evenly distributed across cohesion domains. The concentration of effects in the city centre suggests that design affordances shape behaviour most directly when social engagement occurs under real-time perceptual conditions, consistent with the dynamics of dense and multifunctional urban environments (Gehl, 2011; Mateo-Babiano, 2012).

Key moderation patterns:

- **Perceptual moderators** showed strong and differentiated effects:
  - *Perception of Safety* consistently amplified the relationship between features such as *Pedestrian Design Affordances* and behavioural outcomes ($b = 0.11$ to 0.16). This confirms that users' willingness to engage socially depends on their felt security, an established premise in urban design theory (Jacobs, 1961).
  - *Perception of Familiarity* moderated several links involving *Passive Sociability*, suggesting ambient social presence is enabled when environments feel recognisable and cognitively manageable (Gifford, 2007).
- **Sociodemographic moderators** revealed patterns of selective responsiveness:
  - *Gender* significantly moderated the effects of *Active Frontages* on social behaviours ($b = 0.174$ to 0.321), with stronger effects among women.[3]
  - Notably, *Mixed Use Integration* was associated with reduced *Passive Sociability* among women ($b = -0.183$, $p < 0.05$). This may reflect overstimulation or exposure in busy mixed-use zones, which can inhibit casual or unstructured interaction (Cozens & Love, 2017).
  - *Age* continued to show robust moderation effects ($b = 0.91$ to 1.60), particularly for *Spatial Maintenance & Safety* and *Landmarks & Place Identity*. These features support cognitive clarity and predictability, which are especially valued by older adults (Lawton & Nahemow, 1973).

Taken together, these findings suggest that the behavioural productivity of city

[3]Gender was coded as 2 = female, 1 = male. Positive interaction coefficients therefore reflect stronger effects among women, as detailed in the methodology.

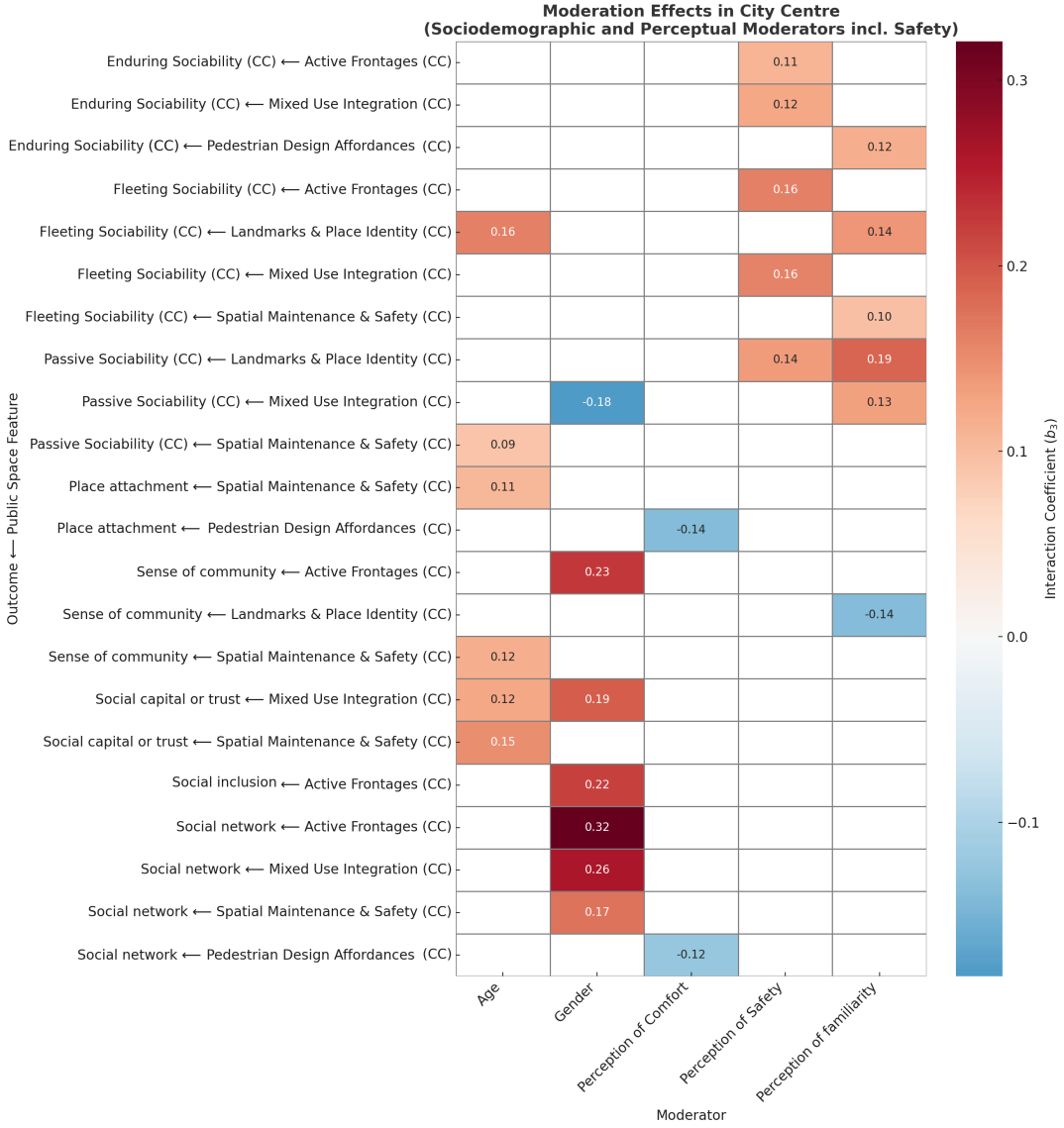

Figure 7.2: Moderation Effects in the City Centre by Sociodemographic and Perceptual Factors.

Note: Heatmap displays interaction coefficients (b_3) from moderation models evaluating how sociodemographic (Age, Gender) and perceptual (Comfort, Safety, Familiarity) factors condition the relationships between public space features (IVs) and social outcomes (DVs). Rows represent unique Outcome ⟵ IV pairs. Cell values indicate the strength and direction of moderation, with a diverging color scale centered at zero. Only significant effects ($p < .05$) are shown; blank cells indicate non-significant interactions.

centre design is strongly conditioned by users' *psychosocial positioning*, defined here as their subjective sense of safety, familiarity, and spatial fit. These contingent effects clarify when and for whom specific design features facilitate or inhibit sociability.

This section also provides a conceptual bridge to the mediation analysis that follows. While moderation analysis addresses *who* benefits and *under what conditions*, the next section focuses on whether and how *Social Interaction* serves as a pathway linking spatial characteristics to social cohesion. Together, these approaches deepen the psychosocial understanding of public space by examining both differential susceptibility and behavioural process.

7.4 Mediation Analysis

7.4.1 Tiering System for Mediator Classification

To synthesise these context-specific results, mediators were assigned to tiers based on frequency of significant indirect effects and magnitude of $\widehat{ab}$:

- Tier A (Most Promising Mediators): Appeared in at least three models, with two or more significant pathways, and an indirect effect exceeding 0.05.
- Tier B (Promising Mediators): Appeared in at least three models, with two or more significant pathways, and an indirect effect between 0.02 and 0.05.
- Tier C (Limited or Context-Specific Mediators): Appeared in at least three models with two or more significant pathways and an indirect effect below 0.02.
- Tier D (Non-Contributory Mediators): Appeared in fewer than three models or had non-significant or weak effects across all paths.

This tiered framework highlights the social interaction pathways that consistently and substantively mediate the effects of public space design on urban social cohesion in both residential neighbourhoods and city centres. Full mediation model outputs are made publicly available at [4].

7.4.2 Tier-Based Summary by Outcome

To synthesise the mediation analysis findings in a form that avoids selective reporting and facilitates cross-model comparison, we summarised the results by *social cohesion outcome*, mediator type, and urban context using the tier system. The tier classification (A–D) reflects the magnitude and consistency of the indirect effect ($\widehat{ab}$)

[4] https://github.com/jieqi1214/psychosocial-analysis

across models, enabling a structured assessment of the mediating role of different forms of sociability. This approach was adopted to pre-empt potential concerns over arbitrary model selection (Baron & Kenny, 1986; Zhao et al., 2010) and aligns with best practices in environmental psychology for presenting multi-model mediation results (Hair, 2014; Li et al., 2023).

Table 7.6: Number of Mediation Models by Tier and Social Interaction Type

Mediator	**Tier A**	**Tier B**	**Tier C**	**Tier D**
Passive Sociability (CC)	0	3	7	15
Fleeting Sociability (CC)	0	0	0	25
Enduring Sociability (CC)	3	15	1	6
Passive Sociability (RN)	2	20	0	3
Fleeting Sociability (RN)	7	13	5	0
Enduring Sociability (RN)	16	9	0	0

As shown in Table 7.6, Tier counts indicate that *Enduring Sociability* in residential neighbourhoods was the strongest mediator, producing 16 Tier A models and no Tier C or D cases. These effects clustered on *Social Network*, *Social Inclusion*, *Sense of Community*, and *Place Attachment* (Figure 7.3), consistent with evidence that sustained, intentional encounters build deeper cohesion (Cattell et al., 2008b). *Fleeting Sociability* also showed notable Tier A frequency (7 models), particularly for *Social Network*, *Place Attachment*, and *Social Inclusion*, supporting findings that brief but repeated encounters can accumulate into trust and local belonging (P. Hickman, 2013; Oldenberg, 2007). By contrast, *Passive Sociability* rarely reached Tier A (2 models) and was predominantly Tier B (20 models), indicating comparatively modest mediation effects.

In city centres, mediation patterns were more diffuse (Table 7.6). *Enduring Sociability* yielded 3 Tier A cases but was dominated by Tier B (15 models), suggesting moderate yet consistent pathways. *Passive Sociability* produced no Tier A cases and concentrated in Tiers C and D, indicating weak and inconsistent indirect effects. This aligns with the moderation results, which in city centre contexts showed significant models for both behavioural outcomes (i.e., *enduring sociability*, *fleeting sociability*) and perceptual moderators such as perceived safety and comfort influencing these behaviours. By contrast, in residential neighbourhoods, significant moderation effects were more often linked to social cohesion outcomes such as *social inclusion*, *place attachment*, and *sense of community*, frequently operating through *enduring sociability*, moderated by *perception of familiarity* and *perception of belonging* (Table 7.4). Together, this distinction suggests that while perceptual qualities shape behaviour in both contexts, the pathways to cohesion differ: city cen-

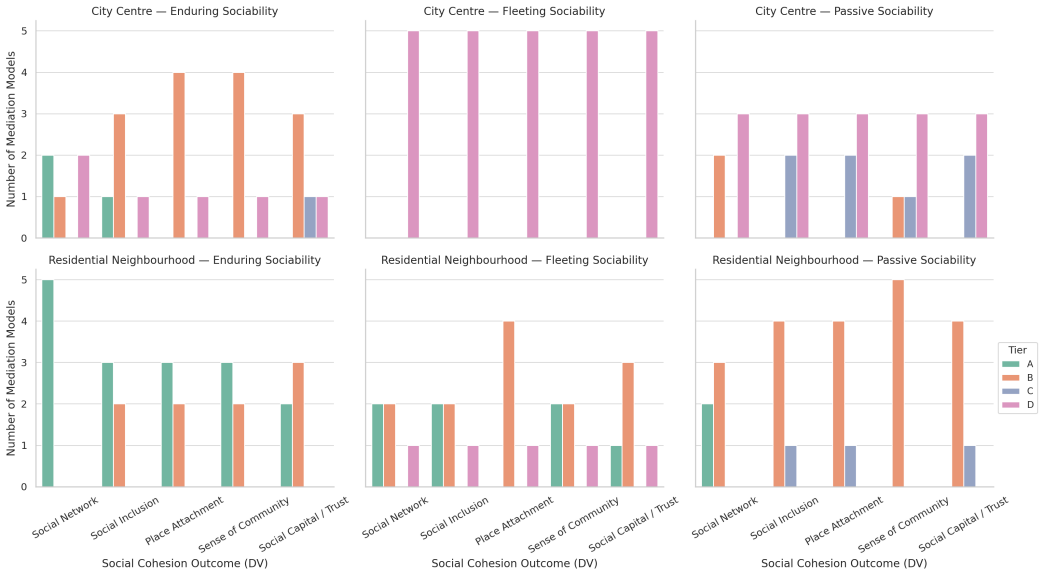

Figure 7.3: Distribution of Mediation Tiers (A–D) Across Social Cohesion Outcomes by Sociability Type and Urban Context.

tre effects are more immediate and behaviour-oriented, whereas residential effects are more relational and cumulative (Heffernan et al., 2014; Wickes et al., 2019).

7.4.3 Mediation Effects Across Urban Contexts

This section synthesises the mediation analysis across the two urban contexts examined, *residential neighbourhoods* and *city centres*, to highlight how spatial design features act through different forms of social interaction to influence social cohesion outcomes. While Section 7.4.2 introduced the tier-based overview, and Sections 7.4.4 and 7.4.5 presented selected models, this synthesis distils the context-dependent mediation structures that shape our understanding of urban social dynamics.

A Rich and Multi-Modal Mediation Ecology in Residential Neighbourhoods

Residential neighbourhoods exhibited the most extensive mediation activity across physical design features and cohesion outcomes (Table 7.7). All three forms of social interaction, *passive*, *fleeting*, and *enduring*, demonstrated non-trivial mediation pathways, though with notable variation in strength and consistency.

- **Enduring interaction** served as the most consistently robust mediator. Across mixed use integration, spatial maintenance & safety, and pedestrian design affordances, indirect effects frequently exceeded $a*b > 0.05$ with tight confidence intervals. These pathways enhanced outcomes such as *social network*, *social inclusion*, and *social capital / trust*, reflecting the importance of recurrent

encounters and relational continuity in neighbourhood settings.

- **Passive interaction** played a consequential role. Contrary to expectations that low-intensity sociability would transmit only marginal effects, passive interactions mediated the influence of several design features, including mixed use integration and spatial maintenance & safety, on outcomes such as *sense of community*, *social network*, and *social capital / trust*. These results align with theories emphasising the cumulative social value of routine visibility and ambient co-presence (Gehl, 2011; Mehta, 2019b).

- **Fleeting interaction** provided limited mediation, with most models falling into *Tier D*. Although occasionally present, fleeting encounters alone did not consistently translate design qualities into cohesion outcomes.

Taken together, residential environments support a *multi-modal interaction ecology*, in which both low-threshold and sustained encounters act as channels through which spatial conditions are translated into social cohesion. This layered mediation structure reflects the patterned, habitual, and relationally diverse nature of neighbourhood life.

Selective and Narrow Mediation in the City Centre

In contrast, mediation pathways in city centres were far more selective and concentrated. As shown in Table 7.8, the vast majority of statistically significant indirect effects involved *enduring interaction* as the mediating mechanism.

- **Enduring interaction** mediated the effects of spatial maintenance & safety, pedestrian design affordances, and selected mixed use features on cohesion outcomes such as *social inclusion*, *place attachment*, and *social capital / trust*. These effects appeared primarily in *Tier B* and *Tier C*, indicating meaningful but contextually constrained pathways.

- **Passive and fleeting interaction** were largely ineffective mediators in the city centre, with nearly all models falling into *Tier D*. The mobility-oriented, anonymous, and transitory nature of city centre use appears to inhibit the kinds of routine, low-effort relational processes that make passive interaction effective in neighbourhood settings.

City centre cohesion is thus routed through a narrower *interaction architecture*, where only forms of engagement that support repeated presence or dwell time translate spatial affordances into psychosocial outcomes.

Key Comparative Insight: Spatial Design Requires Interactional Conditions

Across both contexts, the mediation results confirm that spatial form does not generate cohesion directly. Instead, spatial features shape cohesion only insofar as they enable the social interactions through which relational meaning, recognition, and trust are produced.

- **In residential neighbourhoods**, cohesion arises from a broad constellation of interactional pathways. Both passive and enduring forms of sociability mediate the influence of design features such as mixed use integration, pedestrian affordances, and spatial maintenance & safety. Outcomes such as *sense of community*, *social network*, and *social capital / trust* emerge from a cumulative ecology of repeated co-presence, everyday visibility, and incremental trust-building.
- **In city centres**, mediation is far more limited. Fleeting interaction does not meaningfully transmit design effects, and passive interaction rarely does. Instead, only enduring interaction, rooted in dwell, return visits, and purposefully repeated presence, mediates cohesion outcomes. Spatial features may still show direct effects in city centres, but their influence on cohesion is significantly attenuated without mechanisms that support relational continuity.

Overall, these findings underscore that public space contributes to social cohesion not through design alone but through the interactional affordances design enables. The urban context, with its rhythms, normative uses, and sociomaterial configurations, is an active determinant of interactional possibility. Designing for cohesion therefore requires attending not only to physical form, but also to how space supports social practices across temporal and contextual settings.

Table 7.7: Mediation effects of social interaction types in the residential neighbourhood context

IV	DV	Passive Social Interaction			Fleeting Social Interaction			Enduring Social Interaction		
		Path c'	**a*b (CI)**	**Tier**	**Path c'**	**a*b (CI)**	**Tier**	**Path c'**	**a*b (CI)**	**Tier**
Landmarks & Place Identity	Social Network	0.144***	0.034 (0.012; 0.060)	B	0.136***	0.043 (0.011; 0.077)	B	0.124***	0.055 (0.024; 0.087)	A
Landmarks & Place Identity	Social Inclusion	0.143***	0.029 (0.009; 0.050)	B	0.133***	0.039 (0.009; 0.071)	B	0.129***	0.044 (0.020; 0.071)	B
Landmarks & Place Identity	Place Attachment	0.138***	0.024 (0.008; 0.044)	B	0.130***	0.032 (0.007; 0.059)	B	0.122***	0.041 (0.018; 0.066)	B
Landmarks & Place Identity	Sense of Community	0.135***	0.030 (0.010; 0.052)	B	0.125***	0.040 (0.010; 0.073)	B	0.122**	0.043 (0.020; 0.070)	B
Landmarks & Place Identity	Social Capital / Trust	0.131***	0.026 (0.008; 0.047)	B	0.122***	0.035 (0.008; 0.064)	B	0.121***	0.036 (0.016; 0.059)	B
Pedestrian Design Affordances	Social Network	0.108**	0.059 (0.033; 0.089)	A	0.110**	0.057 (0.021; 0.096)	A	0.060	0.107 (0.070; 0.147)	A
Pedestrian Design Affordances	Social Inclusion	0.167***	0.046 (0.025; 0.072)	B	0.163***	0.051 (0.019; 0.087)	A	0.134**	0.080 (0.050; 0.116)	A
Pedestrian Design Affordances	Place Attachment	0.152***	0.040 (0.020; 0.064)	B	0.150***	0.042 (0.016; 0.071)	B	0.116**	0.075 (0.048; 0.108)	A
Pedestrian Design Affordances	Sense of Community	0.160***	0.049 (0.027; 0.075)	B	0.157***	0.053 (0.020; 0.088)	A	0.131**	0.078 (0.049; 0.113)	A
Pedestrian Design Affordances	Social Capital / Trust	0.196***	0.040 (0.020; 0.065)	B	0.191***	0.045 (0.017; 0.076)	B	0.174***	0.062 (0.036; 0.094)	A
Active Frontages	Social Network	0.078*	0.024 (-0.000; 0.049)	B	-	-	D	0.046	0.056 (0.024; 0.091)	A
Active Frontages	Social Inclusion	0.162***	0.019 (-0.000; 0.041)	C	-	-	D	0.138***	0.043 (0.017; 0.072)	B
Active Frontages	Place Attachment	0.147***	0.017 (-0.000; 0.036)	C	-	-	D	0.123***	0.040 (0.016; 0.067)	B
Active Frontages	Sense of Community	0.132***	0.020 (-0.000; 0.042)	B	-	-	D	0.110**	0.042 (0.017; 0.071)	B
Active Frontages	Social Capital / Trust	0.104**	0.018 (-0.000; 0.038)	C	-	-	D	0.086*	0.036 (0.014; 0.061)	B
Mixed Use Integration	Social Network	0.127***	0.042 (0.018; 0.068)	B	0.124***	0.045 (0.013; 0.080)	B	0.081*	0.088 (0.058; 0.122)	A

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Table 7.7: (Continued) Mediation effects of social interaction types in the residential neighbourhood context

IV	DV	Passive Social Interaction			Fleeting Social Interaction			Enduring Social Interaction		
		Path c'	**a*b (CI)**	**Tier**	**Path c'**	**a*b (CI)**	**Tier**	**Path c'**	**a*b (CI)**	**Tier**
Mixed Use Integration	Social Inclusion	0.144***	0.034 (0.014; 0.057)	B	0.137***	0.041 (0.012; 0.072)	B	0.109**	0.069 (0.041; 0.100)	A
Mixed Use Integration	Place Attachment	0.144***	0.029 (0.012; 0.050)	B	0.138***	0.034 (0.009; 0.061)	B	0.109**	0.064 (0.039; 0.093)	A
Mixed Use Integration	Sense of Community	0.128***	0.036 (0.016; 0.059)	B	0.121***	0.043 (0.011; 0.076)	B	0.096*	0.068 (0.041; 0.098)	A
Mixed Use Integration	Social Capital / Trust	0.113**	0.032 (0.013; 0.053)	B	0.107**	0.038 (0.011; 0.067)	B	0.087*	0.058 (0.034; 0.086)	A
Spatial Maintenance & Safety	Social Network	0.140***	0.059 (0.033; 0.087)	A	0.134***	0.065 (0.030; 0.101)	A	0.117**	0.082 (0.050; 0.118)	A
Spatial Maintenance & Safety	Social Inclusion	0.231***	0.045 (0.024; 0.070)	B	0.218***	0.057 (0.026; 0.089)	A	0.214***	0.061 (0.035; 0.091)	A
Spatial Maintenance & Safety	Place Attachment	0.179***	0.039 (0.020; 0.064)	B	0.170***	0.048 (0.022; 0.075)	B	0.159***	0.059 (0.035; 0.088)	A
Spatial Maintenance & Safety	Sense of Community	0.179***	0.049 (0.027; 0.077)	B	0.168***	0.060 (0.028; 0.094)	A	0.167***	0.062 (0.035; 0.091)	A
Spatial Maintenance & Safety	Social Capital / Trust	0.280***	0.038 (0.018; 0.062)	B	0.267***	0.050 (0.023; 0.079)	A	0.271***	0.047 (0.025; 0.072)	B

*Note: *, **, and *** represent significance at the 10%, 5%, and 1% levels, respectively*

Table 7.8: Mediation effects of social interaction types in the city centre context

IV	DV	Passive Social Interaction			Fleeting Social Interaction			Enduring Social Interaction		
		Path c'	a*b (CI)	Tier	Path c'	a*b (CI)	Tier	Path c'	a*b (CI)	Tier
Landmarks & Place Identity	Social Network	-	-	D	-	-	D	-	-	D
Landmarks & Place Identity	Social Inclusion	-	-	D	-	-	D	-	-	D
Landmarks & Place Identity	Place Attachment	-	-	D	-	-	D	-	-	D
Landmarks & Place Identity	Sense of Community	-	-	D	-	-	D	-	-	D
Landmarks & Place Identity	Social Capital / Trust	-	-	D	-	-	D	-	-	D
Pedestrian Design Affordances	Social Network	-	-	D	-	-	D	0.167**	0.052 (0.019; 0.090)	A
Pedestrian Design Affordances	Social Inclusion	-	-	D	-	-	D	0.187***	0.042 (0.015; 0.074)	B
Pedestrian Design Affordances	Place Attachment	-	-	D	-	-	D	0.122*	0.035 (0.012; 0.063)	B
Pedestrian Design Affordances	Sense of Community	-	-	D	-	-	D	0.190***	0.037 (0.013; 0.067)	B
Pedestrian Design Affordances	Social Capital / Trust	-	-	D	-	-	D	0.243***	0.028 (0.010; 0.054)	B
Active Frontages	Social Network	-	-	D	-	-	D	-	-	D
Active Frontages	Social Inclusion	-	-	D	-	-	D	0.155**	0.027 (0.003; 0.055)	B
Active Frontages	Place Attachment	-	-	D	-	-	D	0.161***	0.022 (0.002; 0.047)	B
Active Frontages	Sense of Community	-	-	D	-	-	D	0.146**	0.024 (0.003; 0.050)	B
Active Frontages	Social Capital / Trust	-	-	D	-	-	D	0.218***	0.019 (0.002; 0.040)	C
Mixed Use Integration	Social Network	0.143**	0.029 (0.008; 0.054)	B	-	-	D	0.110*	0.062 (0.033; 0.096)	A

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Table 7.8: (Continued) Mediation effects of social interaction types in the city centre context

IV	DV	Passive Social Interaction			Fleeting Social Interaction			Enduring Social Interaction		
		Path c'	**a*b (CI)**	**Tier**	**Path c'**	**a*b (CI)**	**Tier**	**Path c'**	**a*b (CI)**	**Tier**
Mixed Use Integration	Social Inclusion	0.131**	0.019 (0.004; 0.039)	C	-	-	D	0.099*	0.050 (0.026; 0.078)	A
Mixed Use Integration	Place Attachment	0.123**	0.016 (0.003; 0.035)	C	-	-	D	0.097*	0.042 (0.020; 0.068)	B
Mixed Use Integration	Sense of Community	0.126**	0.020 (0.005; 0.041)	B	-	-	D	0.102*	0.044 (0.021; 0.072)	B
Mixed Use Integration	Social Capital / Trust	0.135**	0.013 (0.001; 0.031)	C	-	-	D	0.112*	0.035 (0.016; 0.059)	B
Spatial Maintenance & Safety	Social Network	0.141***	0.023 (0.004; 0.044)	B	-	-	D	0.127**	0.037 (0.012; 0.066)	B
Spatial Maintenance & Safety	Social Inclusion	0.168***	0.014 (0.002; 0.030)	C	-	-	D	0.153***	0.029 (0.008; 0.053)	B
Spatial Maintenance & Safety	Place Attachment	0.085*	0.013 (0.001; 0.029)	C	-	-	D	0.072	0.025 (0.007; 0.047)	B
Spatial Maintenance & Safety	Sense of Community	0.138**	0.016 (0.002; 0.034)	C	-	-	D	0.128**	0.026 (0.008; 0.049)	B
Spatial Maintenance & Safety	Social Capital / Trust	0.191***	0.010 (0.000; 0.023)	C	-	-	D	0.180***	0.020 (0.005; 0.039)	B

*Note: *, **, and *** represent significance at the 10%, 5%, and 1% levels, respectively*

7.4.4 Key Models of Interest: Full Mediation Models

In this section, we present the three full mediation models, each depicting the indirect pathway between public space design features and psychosocial (social cohesion) outcomes via forms of social interaction. Each diagram reports standardised coefficients (a, b, c') with significance markers, the indirect effect ($a \times b$) with bootstrapped confidence intervals. In all three models, the direct path (c') becomes non-significant in the presence of the mediator, confirming full mediation (Baron & Kenny, 1986). In other words, the IVs only affects the DVs through the mediators.

Pedestrian Design Affordances → Enduring Sociability → Social Network (Residential Neighbourhood): In residential neighbourhoods, *Pedestrian Design Affordances*, including comfort, articulation, and street-level furniture, were positively associated with *Enduring Sociability* ($a = 0.295^{***}$), which in turn predicted larger *Social Networks* ($b = 0.377^{***}$). The indirect effect ($a \times b = 0.107^{***}$, 95% CI [0.070, 0.147]) represented a substantial share of the total effect, indicating that the social benefits of well-designed pedestrian environments arise chiefly through their capacity to support sustained, meaningful encounters. The full joint model explained $R^2_4 = 0.158$ of the variance in *Social Network*, reflecting the combined explanatory power of physical design and social interaction in cohesion outcomes. This finding is consistent with evidence that finely tuned pedestrian settings encourage ongoing participation in public life and foster the relational bonds that underpin social capital (Mehta, 2019b; Peace et al., 2013).

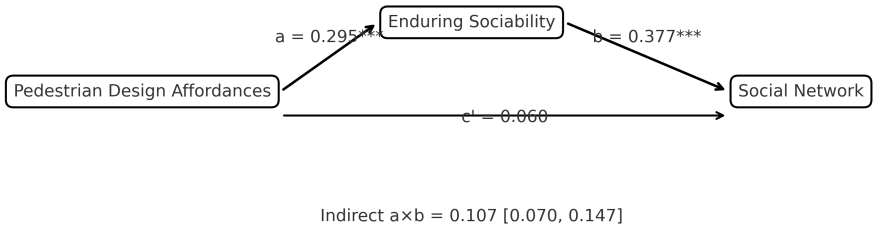

Figure 7.4: Full mediation: Pedestrian Design Affordances → Enduring Sociability → Social Network (Residential Neighbourhood, Tier A, $\Delta R^2 = 0.133$).

*Note: Solid lines denote full mediation; *** represents significance at the 1% level.*

Active Frontages → Enduring Sociability → Social Network (Residential Neighbourhood): In residential neighbourhoods, *Active Frontages*, visually permeable, populated street edges, strengthened *Enduring Sociability* ($a = 0.150^{***}$), which in turn predicted larger *Social Networks* ($b = 0.377^{***}$). The indirect effect ($a \times b = 0.056^{***}$, 95% CI [0.024, 0.091]) indicates that the contribution of active frontages to social network expansion operates through their capacity to sustain repeated, meaningful

encounters. The Step 4 joint model explained 15.7% of variance in the outcome ($R^2_4 = 0.157$), indicating the substantive role of this mediated pathway. This finding aligns with evidence that animated, transparent frontages foster public familiarity and trust (Heffernan et al., 2014), reinforcing their role as a social catalyst rather than merely an aesthetic feature.

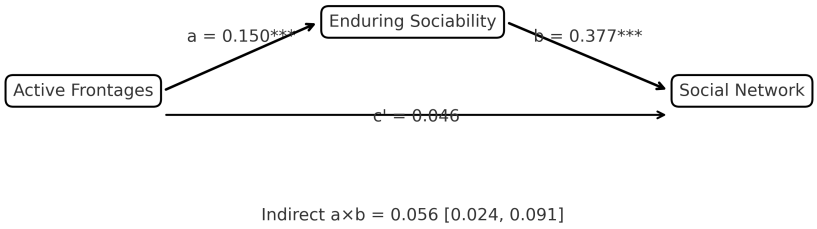

Figure 7.5: Full mediation: Active Frontages → Enduring Sociability → Social Network (Residential Neighbourhood, Tier A, $\Delta R^2 = 0.147$).

*Note: Solid lines denote full mediation; *** represents significance at the 1% level.*

Spatial Maintenance & Safety → Enduring Sociability → Place Attachment(City Centre): In the city centre, *Spatial Maintenance & Safety* ($a = 0.114^{**}$) strengthened *Place Attachment* exclusively by fostering *Enduring Sociability* ($b = 0.229^{***}$). The indirect effect ($a \times b = 0.025^{***}$, 95% CI [0.007, 0.047]) indicates that upkeep and safety measures do not translate into stronger place bonds in isolation; their value lies in creating settings that support sustained, meaningful encounters among users. This aligns with evidence that well-maintained, safe public environments encourage participation in public life (Park & Garcia, 2020), and that such enduring social involvement is a key pathway to attachment (Ujang et al., 2018). The mediation model thus emphasises that physical design investments in city centres will have the greatest impact when they also promote the social conditions underpinning cohesion (Model $R^2_4 = 0.058$ [5]).

7.4.5 Key Mediator patterns: Tier A Mediators

Across both residential neighbourhood and city centre contexts, the Tier A results indicate a clear and consistent pattern. Enduring Sociability is the dominant behavioural pathway through which public space design features shape multiple facets

[5]While the final joint model ($R^2_4 = 0.058$) explains a modest proportion of variance, such values are common in environmental psychology and urban behaviour studies where social and perceptual variables interact with many unmeasured contextual factors (Carr, 1992; Cortina, 1993). Mediation models with a single independent variable, mediator, and dependent variable are designed to test *specific pathways* rather than maximise variance explained, and thus typically yield lower R^2 values (Cohen, 2013).

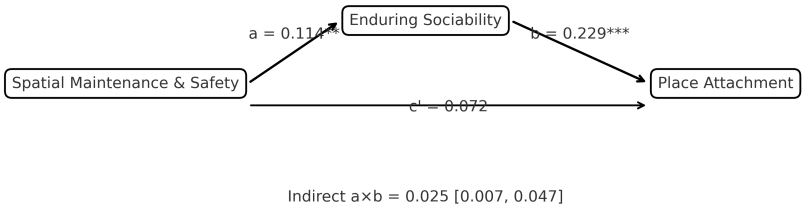

Figure 7.6: Full mediation: Spatial Maintenance & Safety → Enduring Sociability → Place Attachment (City Centre, Tier B, $\Delta R^2 = 0.049$).

*Note: Solid lines denote full mediation; **, and *** represent significance at the 5%, and 1% levels, respectively.*

of social cohesion. This finding reflects a structural relationship between physical affordances, sustained interpersonal engagement, and the formation of trust and networks that is well-documented in environmental psychology (Oldenberg, 1989; Simmel, 2009).

Residential neighbourhoods

In residential neighbourhood contexts, *Enduring Sociability* mediated the relationship between *Pedestrian Design Affordances*, *Mixed Use Integration*, and *Spatial Maintenance & Safety* and all five measured cohesion outcomes (*Social Network*, *Social Inclusion*, *Place Attachment*, *Sense of Community*, *Social Capital/Trust*). The additional explained variance was substantial for social–behavioural processes of this kind ($\Delta R^2 = 0.05$ to 0.168), exceeding the effect sizes commonly observed in in-situ social interaction research (Funder & Ozer, 2019).

While *Enduring Sociability* was the most consistent mediator, *Fleeting Sociability* also reached Tier A status in settings that afforded spontaneous encounters (Pedestrian Design Affordances → Social Inclusion, $\Delta R^2 = 0.136$; Spatial Maintenance & Safety → Sense of Community, $\Delta R^2 = 0.145$). *Passive Sociability*, awareness of others without direct contact, was less frequent but remained significant where visual connectivity and spatial openness supported indirect social exposure (Pedestrian Design Affordances → Social Network, $\Delta R^2 = 0.076$; Spatial Maintenance & Safety → Social Network, $\Delta R^2 = 0.071$).

City centre

The city centre Tier A set was smaller, with only three pathways meeting the highest consistency and effect-size criteria, all involving *Enduring Sociability*. These linked *Pedestrian Design Affordances* and *Mixed Use Integration* to *Social Network* and

Table 7.9: Tier A mediation pathways in residential neighbourhoods (RN): c', indirect effects ($a \times b$ with 95% CI), R_4^2, and ΔR^2.

Dependent Variable	**Mediator Variable**	**Independent Variable**	**Path** c'	$a \times b$ **[95% CI]**	R_4^2	ΔR^2
Landmarks & Place Identity	Enduring Sociability	Social Network	0.124***	0.055 [0.024, 0.087]	0.171	0.138
Pedestrian Design Affordances	Passive Sociability	Social Network	0.108***	0.059 [0.033, 0.089]	0.101	0.076
	Fleeting Sociability	Social Network	0.110***	0.057 [0.021, 0.096]	0.194	0.168
	Fleeting Sociability	Social Inclusion	0.163***	0.051 [0.019, 0.087]	0.179	0.136
	Fleeting Sociability	Sense of Community	0.157***	0.053 [0.020, 0.088]	0.191	0.150
	Enduring Sociability	Social Network	0.060 (f)	0.107 [0.070, 0.147]	0.158	0.133
	Enduring Sociability	Social Inclusion	0.134***	0.080 [0.050, 0.116]	0.118	0.076
	Enduring Sociability	Place Attachment	0.116***	0.075 [0.048, 0.108]	0.114	0.076
	Enduring Sociability	Sense of Community	0.131***	0.078 [0.049, 0.113]	0.115	0.073
	Enduring Sociability	Social Capital / Trust	0.174***	0.062 [0.036, 0.094]	0.106	0.050
Active Frontages	Enduring Sociability	Social Network	0.046 (f)	0.056 [0.024, 0.091]	0.157	0.147
Mixed Use Integration	Enduring Sociability	Social Network	0.081**	0.088 [0.058, 0.122]	0.161	0.132
	Enduring Sociability	Social Inclusion	0.109***	0.069 [0.041, 0.100]	0.114	0.081
	Enduring Sociability	Place Attachment	0.109***	0.064 [0.039, 0.093]	0.114	0.079
	Enduring Sociability	Sense of Community	0.096**	0.068 [0.041, 0.098]	0.109	0.080
	Enduring Sociability	Social Capital / Trust	0.087**	0.058 [0.034, 0.086]	0.086	0.062
Spatial Maintenance & Safety	Passive Sociability	Social Network	0.140***	0.059 [0.033, 0.087]	0.109	0.071
	Fleeting Sociability	Social Network	0.134***	0.065 [0.030, 0.101]	0.199	0.162
	Fleeting Sociability	Social Inclusion	0.218***	0.057 [0.026, 0.089]	0.199	0.126
	Fleeting Sociability	Sense of Community	0.168***	0.060 [0.028, 0.094]	0.196	0.145
	Fleeting Sociability	Social Capital / Trust	0.267***	0.050 [0.023, 0.079]	0.212	0.107
	Enduring Sociability	Social Network	0.117***	0.082 [0.050, 0.118]	0.167	0.130
	Enduring Sociability	Social Inclusion	0.214***	0.061 [0.035, 0.091]	0.144	0.072
	Enduring Sociability	Place Attachment	0.159***	0.059 [0.035, 0.088]	0.127	0.076
	Enduring Sociability	Sense of Community	0.167***	0.062 [0.035, 0.091]	0.126	0.075

*Note: *, **, and *** represent significance at the 10%, 5%, and 1% levels, respectively. (f) denotes c' from the full mediation model.*

Table 7.10: Tier A mediation pathways in city centre (CC): c', indirect effects ($a \times b$ with 95% CI), R_4^2.

Dependent Variable	**Mediator Variable**	**Independent Variable**	**Path** c'	$a \times b$ **[95% CI]**	R_4^2	ΔR^2
Pedestrian Design Affordances	Enduring Sociability	Social Network	0.167***	0.052 [0.019, 0.090]	0.115	0.090
Mixed Use Integration	Enduring Sociability	Social Network	0.110**	0.062 [0.033, 0.096]	0.109	0.089
Mixed Use Integration	Enduring Sociability	Social Inclusion	0.099**	0.050 [0.026, 0.078]	0.074	0.058

*Note: *, **, and *** represent significance at the 10%, 5%, and 1% levels, respectively*

Social Inclusion ($\Delta R^2 = 0.058$ to 0.090). The reduced number of strong pathways likely reflects the city centre's already high baseline of incidental contact; in this dense social ecology, additional design effects emerge only from the most interaction-supportive features. This is consistent with the moderation analysis (Table 7.5), where perceived comfort amplified these effects in city centre spaces but had less influence in residential neighbourhood contexts (Table 7.4).

7.5 Conclusion

In this chapter, through the integration of moderation and mediation analysis, we demonstrated that the contribution of public space design to social cohesion is both *conditional* and *mechanistic*. The findings confirm that spatial–social associations vary not only with the physical affordances of place but also with the psychosocial positioning of users, and that these associations operate through identifiable behavioural pathways.

In residential neighbourhoods, the moderation analysis showed that gender, age, and perceptions of belonging systematically condition the benefits of interaction-supportive design. These findings reflect established socio-ecological patterns in public space use, where spatial form interacts with user identity and lived experience to structure opportunities for contact (Cattell et al., 2008b; Lawton & Nahemow, 1973). Mediation analysis identified *Enduring Sociability* as the most consistent pathway linking key features, *Pedestrian Design Affordances*, *Mixed Use Integration*, and *Spatial Maintenance & Safety*, to all five cohesion outcomes. Effect sizes ($\Delta R^2 = 0.05$–0.168) exceeded benchmarks for in-situ interaction research (Funder & Ozer, 2019), evidencing the robustness of these processes. *Fleeting* and *Passive Sociability* also played context-specific roles, particularly in visually open, permeable spaces that facilitate indirect awareness and unplanned encounters.

In the city centre, moderation effects concentrated on behavioural outcomes, strongly shaped by perceptions of safety, familiarity, and comfort. Women responded more positively to *Active Frontages*, while high-intensity mixed-use zones reduced passive sociability for some groups, consistent with overstimulation effects in dense, multi-functional environments (Cozens & Love, 2017). Mediation results revealed fewer high-strength pathways ($\Delta R^2 = 0.058$–0.090), all involving *Enduring Sociability*. This contraction likely reflects the city centre's high baseline of incidental encounters, where only the most interaction-supportive features generate additional social benefits.

Furthermore, the integration of cross-context modelling with perception-sensitive variables offers a novel way to operationalise behavioural and cohesion processes

as measurable, scalable indicators. In contrast to the behavioural mapping framework, which addresses post-occupancy evaluation by quantifying spatial–temporal presence and co-presence configurations, these survey-derived indicators capture the contingent role of perception and identity in activating design affordances. Move beyond form-based audits (i.e., space syntax, design quality indexes, etc.) and observational audits, the findings confirm that design form, identity, and perception operate as an integrated system in shaping social cohesion, an interdependence long recognised in urban design and environmental psychology (Kahana et al., 2003; Lynch, 2014). Grounded in the methods of spatial–social theories of encounter (Talen, 2000), the embeddedness of cohesion in place-specific social structures (Forrest & Kearns, 2001), and the mediating role of public space quality in everyday sociability (Mehta, 2019b), the analysis demonstrates that these dimensions are mutually conditioning.

For practice, the findings highlight the need for a dual strategy when it comes to policy and design intervention: (1) maximise physical affordances that support repeated, meaningful interaction; and (2) address perceptual and identity-based conditions, such as safety, belonging, and comfort, that enable these affordances to be realised. This evidence provides a quantitative basis for targeted investment strategies, whether enhancing safety and familiarity in dense centres or fostering belonging in peripheral neighbourhoods. The next chapter (Chapter 8) builds on these modelled patterns, bringing forward user narratives that reveal how people interpret, negotiate, and sometimes resist the spatial–social dynamics quantified here.

Chapter 8

Focus Group Findings

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8.1 Introduction

In this chapter, we address Research Question 4: *How do individuals understand, experience, and negotiate social interaction and cohesion in public spaces?*

This chapter provides the qualitative complement to the behavioural mapping analysis (Chapter 6) and psychosocial modelling (Chapter 7). Whereas those chapters established *where*, *when*, and *with whom* people interacted and, statistically, *for whom*, *under what conditions*, and *through which processes* cohesion emerges, here we examine the interpretive processes through which such encounters acquire meaning. We move beyond identifying spatial-behavioural patterns or statistical pathways to investigate how public spaces are subjectively understood, evaluated, and navigated in everyday life.

As previous research has shown, the capacity of public space to foster cohesion is shaped both by its material affordances, as well as social norms, identity cues, and personal histories (Aelbrecht et al., 2019; Amin, 2002; Cattell et al., 2008b). Yet these influences are rarely uniform since individuals and groups can perceive the same setting in markedly different ways, producing negotiated or contested meanings (P. Berger & Luckmann, 2016). Focus groups are particularly suited to capturing this socially constructed dimension where participants co-produce narratives, test each other's accounts, and reveal how perceived inclusion, safety, and belonging emerge through dialogue.

Our aim here is not to provide insight into the *why* and *how* behind these patterns, by exploring how people interpret what they encounter in public spaces, how perceptions are shaped by identity and lived experience, and how these perceptions influence subsequent behaviour. This interpretive dimension is essential for explaining phenomena that observation or survey items alone cannot capture.

The findings presented here draws on participants' accounts of living in and engaging with different urban contexts. While some participants currently reside in Sheffield, they also reflected on public spaces in other towns and cities where they had previously lived or grown up. These accounts reveal how both present-day context and past experience inform perceptions of public space (S. M. Low, 2000; Tuan, 1979), providing a comparative depth that strengthens the interpretation of the observed patterns from earlier chapters.

The thematic analysis is structured to highlight the interdependencies between material conditions, social structures, and lived experience. In doing so, it advances the multi-lens framework introduced in Chapter 2, linking:

- **Spatial–behavioural**: where and when patterns of interaction occur;

- **Social–ecological**: how systemic relationships between social actors and spatial systems influence cohesion;
- **Psychosocial**: how meanings, memories, and emotions shape public space experience.

By integrating these perspectives, we position the focus group findings as a necessary interpretive bridge between the empirical regularities established in Chapters 6 and 7 and the lived, context-rich experiences that give those regularities meaning. The chapter proceeds by identifying thematic structure derived from the analysis (Section 8.2), followed by a detailed discussion of each theme. Section 8.3 and 8.4 further situate these insights within the thesis-wide conceptual and empirical framework.

8.2 Thematic Findings

Our focus group analysis generated five interlinked themes. Collectively, they form a progression from the material conditions that enable social interaction, through the normative and identity-based structures that shape access, to the situational and temporal contingencies that ultimately modulate whether cohesion emerges. Each theme is grounded in recurrent patterns across participants, examined for negative or divergent cases, and cross-checked against the behavioural mapping (Chapter 6) and psychosocial modelling results (Chapter 7).

We use these themes to explain *why* observed spatial–behavioural patterns and statistical relationships hold, *where* they attenuate, and *how* context-specific processes either reinforce or disrupt pathways to cohesion.

8.2.1 Physical Design Affordance as Preconditions

Across the studies, physical design features, particularly benches, shade, permeability, and visual openness, emerged as preconditions for social interaction. In the behavioural mapping, passive interaction clustered in spaces affording clear sightlines and ease of movement, where the opportunity to observe or linger existed without the pressure to perform social roles. These findings aligned with the survey study, where pedestrian design affordances and active frontages were found to indirectly increase social cohesion via elevated frequencies of interaction. Such associations were not incidental. As the focus group narratives made clear, these affordances structured the conditions under which sociability might unfold.

Participants consistently framed benches, shade, and upkeep as fundamental social infrastructure rather than decorative enhancements. One noted that:

> *"Western Bank Park is close, feels more of a spur of the moment to go there to sit down for a few hours or an hour before going home."*

This underlined how proximity and comfort enabled spontaneous social inhabitation. Another participant reflected on the value of visual permeability:

> *"You wait there, you can see people better before you meet them."*

These statements reinforce the behavioural finding that spaces supporting pausing and informal surveillance were conducive to lingering and encounter.

However, as Cattell et al. (2008b) observe, the material features are interpreted socially rather than objectively fixed in meaning. A bench may invite or exclude depending on its context. Participants emphasised that clean, visible, and well-positioned seating could project a message of inclusion, *"this is a place to sit and belong"*, but might equally symbolise exclusion when surrounded by physical neglect or dominated by particular social groups. These nuances were often filtered through the lens of prior social experience, identity, and local norms. For instance, a Chinese university lecturer described Division Street as both lively and exclusionary:

> *"...on Division Street, it's pedestrian friendly, lots of bars there, every time I pass by, young people will be sitting outside drinking and I respect young people... they just enjoying their life. And then it also can be loud, I would say probably more senior people like me aren't likely to stay out late..."*

This interpretation illustrates how affordances interact with perceived cultural ownership of space, contributing to selective patterns of use and avoidance.

Such reflections underscore that physical affordances establish the groundwork for interaction, yet fuller engagement arises only through accompanying social and contextual conditions. While they can lower the threshold for sociability, their potential is activated or constrained through local norms, perceived safety, and signals of inclusion or exclusion (Kiverstein, 2024). What appears, in design terms, as neutral infrastructure is, in practice, a relational and interpretive field.

> *"Western Park is really close by, so sometimes after lunch, I'll just go there for a walk or even bring my lunch with me, find a shaded area, just enjoying the views. The park itself is really inviting. There are plenty of benches where you can sit and just relax. Sometimes I just enjoy watching other people, it's a nice place to be. The layout and how the space is designed really makes it easy and comfortable to spend time there...."*

Participants' reflections suggest important implications for design and management. Benches, shade, and spatial permeability were described as basic conditions that enabled lingering, observation, and informal encounter. Their presence was consistently linked to opportunities for sociability, particularly when combined with a sense of comfort and visibility. As one participant noted, these features allowed people to *"wait there, and see people better before you meet them."* Yet such affordances were not sufficient in themselves. Their social meaning was contingent on upkeep, location, and wider atmosphere. A well-placed bench could signal welcome when clean, shaded, and visible, but could just as easily signal exclusion when surrounded by neglect or dominated by one group. This reading aligns with prior work showing that physical affordances acquire significance through social interpretation (Aelbrecht, 2016; Cattell et al., 2008b; Mehta, 2009). In this sense, benches, shade, and pathways were interpreted as social infrastructure, conditions that invite or constrain interaction depending on how they are maintained and read.

This can also be addressed at the policy level by reframing these features as preventive investments in urban cohesion and health. Participants' narratives resonate with the idea of *sociability thresholds*, whereby minimal conditions, such as seating at regular intervals, shaded areas, and open sightlines, shape whether people pause, interact, or feel safe to linger. Related arguments link micro-scale design to sustained urban sociability (Francis et al., 2012; Whyte, 1980) and to neighbourhood attachment and comfort (J. Kim & Kaplan, 2004; Leyden, 2003). Local design guidance could embed such thresholds into planning standards (e.g., minimum resting points per walking distance; comfort zones mapped to age and visibility needs), much as active-transport benchmarks operationalise walkability. In doing so, everyday sociability can be treated as a planned and monitored outcome.

8.2.2 Normative Structures and Informal Regulation

Building on the foundational role of physical affordances, participants highlighted a parallel and equally influential layer of governance. The normative order of public space. This refers to the unspoken rules, implicit expectations, and informal mechanisms of inclusion and exclusion that regulate conduct, presence, and belonging (H. Nguyen, 2019; Ujang, 2012). In contrast to the material infrastructure discussed in the previous theme, these dynamics operate symbolically, through the interpretation of space, social cues, and interpersonal judgments.

Participants frequently described avoiding particular areas not because of poor design, but due to perceived social incongruity or a sense that those spaces were *"not for people like me"*. Such patterns of tacit regulation help explain why, in Chapter 6, demographically narrow or homogenous user clusters persisted even in physically ac-

cessible and well-equipped environments. These findings further reflect the work of Lotfata and Ataöv (2020) and Salimi et al. (2019), who argue that informal social controls, ranging from tacit surveillance to culturally coded norms, shape spatial behaviour in ways that formal policy often fails to anticipate.

An Asian female participant reflected on her experience of Ecclesall Road:

> *"You see different crowd, and you so get, get that hint of ... on a Friday night, you perhaps get a lot, it's quite student area. You'll get a lot of students there, you go there to drink, to social nights."*

Similarly, a middle-aged white British mother remarked:

> *"Yeah, but I guess an elderly couple might not go to Wetherspoons on a Friday night at nine... then you can see certain areas, like Devonshire Green, there's the skateboard space, and then the teenagers would go there."*

Such reflections illustrate what Salimi et al. (2019) describe as the spatialisation of social difference, where certain groups internalise cues about where they are welcome or out of place. These distinctions are embedded with subtle signals, i.e., group composition, time of day, dress, noise, or perceived social codes. As Lotfata and Ataöv (2020) notes, these informal regulations often emerge from shared histories, power asymmetries, and localised cultural scripts, rather than universal standards of design or access.

These qualitative accounts also help interpret the findings from Chapter 7, where moderation analysis showed that perceived comfort and belonging significantly shaped the relationship between design features and social outcomes. In these cases, normative conditions acted, as amplifiers encouraging interaction and shared use in inclusive contexts, or as gatekeepers silently discouraging diversity when local norms were perceived as exclusionary.

Thus, while physical affordances enable the possibility of encounter, normative structures govern its probability. The spatial potential for sociability may remain unrealised if the social atmosphere communicates exclusivity, judgement, or symbolic ownership.

These reflections suggest important implications for design and management. Participants repeatedly described how social expectations, rather than physical design alone, shaped whether they felt able to use a space. One young professional explained, *"I don't go through there at night, not because it's dark or unsafe, but because it feels like it's their place, not mine"* Another participant noted of Division Street in summer, *"you can sit outside, but you know it's mostly for students*

and younger people, so you just pass by" These remarks underline that interventions cannot be reduced to material provision: their meaning is filtered through group presence, cultural scripts, and tacit codes. This aligns with what Salimi et al. (2019) describe as the spatialized social difference, where soft signals, i.e., dress, noise, or time of day, convey who belongs. For practice, this points to the need for pairing physical design with forms of social infrastructure such as visible management, community ambassadors, and inclusive programming that recalibrate local expectations and widen participation (Soopramanien et al., 2023; Spierings et al., 2016).

At the policy level, these accounts highlight that normative regulation must be treated as a deliberate focus of intervention rather than a background condition. As an Indonesian mother reflected on her observation on some of the pubs and bars located on Ecclesall Road, *"nothing stops you from going in, but you just know it's not really for you."* Such subtle signals can undermine otherwise inclusive investment if left unaddressed. Policy responses that combine physical upgrades with symbolic invitations: multilingual signage, cultural mixing events, or visible care taking roles, send a counter-message of openness and belonging (A. Ortiz et al., 2004). This aligns with Lotfata and Ataöv (2020), who argue that informal social controls often carry more weight than formal provision in shaping public life. The focus group participants therefore confirm that while affordances create potential for encounter, it is the normative atmosphere, negotiated through everyday signals that ultimately governs whether interaction and cohesion materialise.

8.2.3 Belonging, Attachment, and the Negotiation of Change

For most participants, neighbourhood public spaces that facilitated everyday encounters, loose ties, and informal support networks were described as central to their sense of belonging and social well-being. The participants rarely spoke about such spaces in abstract terms of design or aesthetics; interestingly, they framed them through their lived interaction with neighbours and familiar faces. As observed Talen (2000), the public space functions as both a physical setting and a social arena where the attachment and continuity of community life are negotiated. More recent studies also highlight how emotional significance and local ties underpin perceptions of comfort and safety, while highlighting that the material and symbolic dimensions of the attachment to the place are crucial to maintaining cohesion and mitigating feelings of displacement (Lebrusán & Gómez, 2022; Lomas et al., 2021).

One recently arrived Sheffield resident reflected on the contrast between his old town and his new neighbourhood of Broomhill:

> *"Coming from a town was, like, mainly a white population, but it's close, it's a tight community... like everybody knows each other, and you've really got, you have good rapport... I was quite social back at home."*

He went on to describe how diversity in his new neighbourhood reshaped his experience of community:

> *"It's more diverse here, you saw them how they was all interacting on the street, and they're saying, I think it's, it's habibi, and kind of learning their culture... coming to here, and you have your social mixing. I kind of broke out my shelter, see people on street and say hello, I wanted to be more in part the community."*

This narrative exemplifies how belonging is materially and symbolically constructed, through the presence of familiar cultural cues on the one hand, and through opportunities for new forms of social mixing on the other. Such accounts support the behavioural mapping findings in Chapter 6, where clusters of co-presence often reflected social and personal ties rooted in shared routines and mutual recognition (Section 6.3).

At the same time, participants also voiced resistance to changes in their local environment, especially where a strong sense of comfort and attachment already existed. One middle-aged male resident in Crookes described a local controversy around traffic-calming interventions:

> *"I think the reason they put these large pots down to change the roads and make areas either blocked off or one way was for the school, to stop lots of traffic flowing through too fast and dangerously... but there was a lot of uproar because it does sort of change the routes you had to go, and certain roads are not the greatest around there, so you have to kind of understand the roads to get back where you're going."*

Here, resistance was not to the principle of safety improvement but to the disruption of everyday practices and familiar routines that defined local belonging. This pattern aligns with the survey study findings in Chapter 7, which showed that in residential neighbourhoods where perceptions of comfort and safety were already high, physical interventions sometimes diminished experiences of place attachment, social inclusion, and social networks (Table 7.4). In other words, interventions that overlook the symbolic and emotional fabric of neighbourhood life risk undermining cohesion, even when materially well-intentioned.

Taken together, these accounts highlight that belonging is actively produced through material cues, social recognition, and the negotiation of change. For some, the pres-

ence of co-ethnics or families enhanced comfort and continuity; for others, unfamiliar changes disrupted existing scripts of inclusion. The implication is that cohesion depends on making spaces legible and welcoming across multiple identity positions, while also respecting established practices and cultures of use. As Lomas et al. (2021) argue, emotional well-being in urban environments is inseparable from local identities. Therefore, neglecting the lived dimension of attachment risks eroding precisely the forms of everyday solidarity that urban policy seeks to strengthen (Lebrusán & Gómez, 2022).

Participants' reflections also point to important considerations for design and management. Where belonging was viewed in established routines, even well-intentioned interventions could be read as disruptive, reflecting the need to see attachment as an active process of negotiation. As one resident reflected, *"you change the roads, you change the routes, and it's not the same any more... it feels like they didn't think about how we actually use it."* Such remarks highlight that design strategies must preserve the affective qualities that sustain familiarity while also creating openings for new forms of inclusion. Continuity and change are not mutually exclusive. Interventions were more positively received when they were explained and visibly connected to local priorities, rather than introduced as abstract technical solutions. As Lebrusán and Gómez (2022) observe, attachment is both sustaining and potentially exclusionary, and our findings suggest that cohesion arises when material improvements are embedded within existing cultural rhythms and everyday practices (Lomas et al., 2021).

Furthermore, participants valued visible cues of recognition that signalled both respect for existing attachments and invitations to difference. A Chinese university student who resides in the student hall close to Bramall Lane explained: *"It helps when you see something that's yours... your language, your food, or just people you can relate to. Then you feel you belong, but you also learn from others."* In this way, multilingual signage, culturally diverse events, or layouts that accommodate different routines were read not simply as amenities but as markers of inclusion. These findings resonate with calls to design public space with cohesion explicitly in mind (Aelbrecht et al., 2021), recognising that belonging is strengthened when residents see both continuity with the familiar and symbolic openings to diversity. As Cattell et al. (2008b) argue, cohesion depends on the subtle layering of material cues, social recognition, and everyday solidarity. Policies that treat attachment as a resource rather than a barrier can therefore enable neighbourhoods to adapt without eroding the solidarities that make them resilient (M. Harris & Young, 2009; Priest et al., 2014).

8.2.4 Negotiated Safety and Comfort

Participants described safety and comfort as contingent processes negotiated at the micro-level of everyday movement and encounter. These negotiations were often unequal, shaped by identity, prior experience, and situational cues (Valentine, 2008). A white office worker, for example, spoke of avoiding moments of uncertainty:

> *"But then there is a difference between that just being silly or mucking about, which then can cause things to get broken... which can be a bit insensitive, you tend to avoid."*

Following this point, an Asian male reflected on his journey home through streets near the city centre:

> *"So if I'm walking at night, sometimes it could be super quiet, nobody's about. And there's buildings about that look quite derelict on my way home... So it's not necessarily the area. The area can have effect to a degree... the moment you see somebody walking towards you, how they're dressed, how they're acting, how they're speaking will impact how you feel as well. If I'm walking at night in my area and somebody's walking towards me with a briefcase and a suit, you know... it's more intimidating."*

These accounts illustrate how safety emerged as an ongoing, situated negotiation. Participants differentiated between physical risk (threats from anti-social behaviour or vandalism) and psychosocial safety (the sense of not being watched, judged, or harassed). These perceptions were contingent on rhythms of time, crowd composition, and environmental cues, i.e., spatial maintenance and safety. A street might feel convivial yet threatening at times. This links well with the findings from Chapter 7, where perceived safety significantly conditioned the impact of design features on both social interaction and cohesion, particularly in city centre contexts (Table 7.5). This interpretation resonates with Gibert-Flutre (2022), who conceptualises urban safety as a rhythmic condition, fluctuating with temporal cycles of presence, absence, and activity. Perception of comfort in urban space is co-constructed through embodied routines and relational judgments.

Participants' reflections also suggest important implications for design and management. Safety was described as something negotiated through the interaction of time, setting, and social presence. One young man explained, *"if I walk home late, and it's empty, you notice every little thing... the buildings, the shadows. But if there's people about, even strangers, it feels fine."* Another participant noted, *"in the day you don't think about it, but at night you choose a different way, even if it's longer."*

These narratives highlight that design affordances, including lighting, permeability, sightlines, are necessary but insufficient unless they are paired with strategies that address shifting rhythms of public life. They show what Gooren (2023) call *"the logic of everyday safety"*, where micro-negotiations between individuals and their environment are mediated by trust, recognition, and interpretive cues. As D. Gray and Manning (2022) also observes, the perception of who else occupies a space can amplify or undermine the sense of comfort, regardless of formal risk levels. For practice, this highlights that safety management requires temporal sensitivity, design choices must anticipate variation across day and night, weekday and weekend, peak and lull.

In addition, the findings emphasise that safety should be integrated as a responsive and lived dimension of urban governance. As one Chinese student put it, *"...you see the lights are there, but it's how you feel when someone walks towards you that matters. ...if you have to go out during the night, you go in groups, like with your friends, then you know it is safer. "* Such comments underline that subjective comfort can be as influential as recorded incidents in shaping behaviour and cohesion. Policy frameworks should therefore combine physical improvements, enhanced lighting, clear sightlines, and active edges, with interventions that signal care and presence, such as scheduled community events, visible stewards, or temporary programming during high-risk periods. Crucially, evaluation must track perceptions of safety alongside incident data, recognising that safety emerges not only from crime reduction but from the everyday negotiations through which people decide whether to stay, pass through, or avoid particular spaces (Gibert-Flutre, 2022).

8.2.5 Temporal and Spatial Modulation of Cohesion

Participants highlighted how rhythms of time and season, as much as physical design, structure opportunities for encounter. Instead of being a uniform or continuous condition, cohesion was described as something punctuated by moments of gathering, i.e., festivals, weekly markets, seasonal changes, or even sunny afternoons. As one participant put it:

> *"We linger in the centre on nice days; we go for winter festival events like the Christmas markets..."*

Urban theorists emphasise that such temporal dynamics are central to the public life of cities. Amin (2002) has argued that urban cohesion often emerges from fleeting, situational encounters, i.e., "micro-publics" that are less about permanent solidarities than about rhythms of mixing that accumulate significance over time. Similarly, B. Quinn et al. (2021) shows how periodic cultural events can operate as

temporary infrastructures of belonging, where collective participation bridges social divides. Our findings reflect these perspectives. Festivals and markets were not only moments of conviviality but also catalysts for unfamiliar connections, providing the "structured serendipity" that transforms space into a stage for interaction. In parallel, Elfartas et al. (2022) stresses that temporal and cultural programming must be designed with inclusion in mind; otherwise, they risk reinforcing boundaries by appealing disproportionately to certain groups.

Participants' reflections illustrated this clearly. Two Chinese university students described their use of Peace Gardens as part of a routine stopover en route to the Moor market, noting its appeal on sunny days for people-watching. Yet their visits to the Botanical Gardens were more intentional:

> *"Botanical Gardens is nice and like a destination... I normally go there, to take my friends there when they come visit me, show them something beautiful and different."*

The other echoed:

> *"In Autumn, the leaves turn red and golden, it's beautiful, we like to take pictures in Western Bank Park, it's close to the university."*

When asked about Ecclesall Road, however, they expressed less familiarity, remarking:

> *"I prefer the city centre because it's the convenience factor. We've been able to walk into town and you got everything there on your doorstep sort of thing."*

These narratives help to interpret the marginalisation clusters observed in Chapter 6 (Section 6.3), where Asian and Southeast Asian users were disproportionately concentrated in city centre public spaces. Rather than evidence of exclusion by design, this pattern reflects how temporal-spatial routines, convenience, and cultural programming intersect to channel use. Yet it also signals a potential inequity: if certain groups are less present in neighbourhood or peripheral parks, opportunities for everyday mixing remain spatially constrained.

Participants' accounts suggest that cohesion must also be understood in rhythmic terms. What made spaces feel sociable and cohesive was not simply their form, but their ability to host repeated, recognisable moments of encounter that became embedded in daily routines. One participant described Peace Gardens as a place she visited almost automatically, noting, *"living in the city centre is easy, if the sun is out, you just go there, you know you'll see people... it is most likely there will be children playing by the water fountain if it is a weekend, it's like part of the day."*

Another explained how seasonal events shaped her attachment, saying, *"in winter I only go for the food festivals, it feels alive then; the Christmas decoration in the city centre, there is always like events going on during that Christmas month, the rest of the time you wouldn't think to stop, because it's cold, it gets dark early, and there are probably will be some drunk people getting rowdy..."* These reflections show that encounters are sustained when they become predictable features of urban life, anchored to both everyday and cyclical rhythms. This resonates with Y. Zhang and Dimitrijevic (2025) and Gastelum-Vargas (2025), who emphasise that cohesion is cultivated through temporal regularities as much as spatial affordances. As Amin (2002) also argues, public space operates as a site of ongoing negotiation, where repetition produces familiarity, trust, and recognition. For design and management, this means evaluations must attend not only to material features but also to the timing, recurrence, and inclusivity of programmed activities.

These findings highlight the value of cultivating what might be called *social infrastructures of time*. Markets, seasonal festivals, and weekend activities were consistently described as moments when spaces felt inclusive and animated, even by participants who otherwise avoided them. One Walkley resident noted, *"I don't usually go into town, but when the market is on, you go, and everyone is there... it's different, a lot of events and stuff going on, more mixed... I know I will probably bump into some familiar faces, because you know the regulars..."* Such interventions create recurring opportunities for diverse groups to share space, but they also risk reproducing exclusivity if dominated by particular demographics. Policy frameworks should therefore embed temporal design principles alongside physical standards, for example by developing calendars of rotating events and monitoring participation to ensure reach across age, ethnicity, and social groups (Elfartas et al., 2022; B. Quinn et al., 2021). In this way, cohesion is cultivated not only through spatial infrastructures but also through temporal ones, aligning the rhythms of place with the rhythms of community life.

8.3 Focus Group Explanations of Survey and Behavioural Patterns

This section draws on the focus group findings to explain key patterns identified in the behavioural mapping (Chapter 6) and survey study (Chapter 7). Its purpose is to highlight how participant meaning-making clarifies otherwise opaque trends observed in spatial behaviour and perceptual data. The analysis remains grounded in the qualitative voice and respects the interpretive logic developed through coding and thematic development.

8.3.1 From Themes to Interpretive Mechanisms

Participants described public space not as inherently cohesive, but as conditionally so, depending on design, norms, safety, belonging, and time. These five themes, developed inductively through coding (see Section 8.2), are reframed here as interpretive mechanisms. Together, they capture how users evaluate, inhabit, and attach meaning to space. Each mechanism reflects layered, lived experience and helps explain spatial and perceptual disparities revealed in earlier chapters.

Figure 8.1: Interpretive mechanisms of cohesion derived from focus group narratives.

Figure 8.1 visualises these mechanisms, surrounded by contextual qualifiers, such as cultural legibility, rhythm disruption, and norm-identity feedback loops, that condition their expression. This interpretive framework is presented as a mid-level analytic scaffold, grounded in empirical saturation and structured through recursive coding. The two-layer design, core mechanisms (themes) and contingent qualifiers, reflects the analytic need to distinguish between stable interpretive logics and contextual modifiers. This format was emerged iteratively through comparative memoing and theme refinement across participant accounts. Similar layered approaches have been used in urban and environmental psychology to explain contingent effects in complex social settings (Amin, 2010; Dempsey, 2008). A single-layer or linear model failed to capture the contingent, co-constructed nature of cohesion; yet more abstract theoretical models risked detaching from lived experience. The two-layer structure offers a middle ground that is empirically defensible, methodologically transparent, and conceptually legible.

8.3.2 Explaining Patterns Observed in Other Methods

The need for this framework arose from empirical tensions in previous chapters. Quantitative results showed significant variation in interaction, sociability, and cohesion across spatial and temporal contexts. Focus group narratives help explain why these variations occur, not in design alone, but in perception, memory, and meaning.

1. Design Affordance and Underuse. Behavioural mapping showed that sociability clustered in amenity-rich areas. Yet focus group participants noted that these affordances only enable cohesion when they are interpreted as welcoming. Benches, greenery, or openness were seen as "invitations" in some contexts and exclusionary cues in others, depending on perceived ownership and cultural alignment. This supports Dempsey (2008)'s view that design alone is insufficient without symbolic legitimacy.

2. Normative Structures and Use Scripts. Participants described informal rules shaping how space is used, what's acceptable, when, and by whom. Survey models showed variation in social interaction outcomes moderated by gender and age. Focus group data clarified that many users navigate space with implicit scripts in mind, for example, silence at certain hours, avoidance of crowded zones, or avoidance of spaces dominated by other groups. These unwritten rules regulate interaction more strongly than formal regulations.

3. Belonging, Identity, and Resistance. Despite high perceived belonging in residential areas (survey), focus groups revealed resistance to change, even when aimed at improvement. This resistance stemmed from fear of losing place-based identity. Participants described attachment to sensory routines and familiar rhythms. New neighbourhood public space interventions triggered concerns about erasure rather than inclusion. This supports Holland et al. and Kim and J. Kim and Kaplan (2004)'s argument that cohesion depends on symbolic continuity.

4. Safety and Temporal Volatility. Survey findings showed perceived safety as a strong moderator of sociability, especially in the city centre. Behavioural mapping revealed off-peak declines in use. Participants explained these patterns through real-time assessments of safety—light, visibility, known incidents, and group presence all shaped decisions to linger or leave. This aligns with Amin (2010)'s account of cohesion as situational and continually reproduced.

5. Temporal and Spatial Rhythms. Across all groups, participants structured their space use around daily, weekly, and seasonal cycles, that is, school runs, lunch breaks, weekends, and work hours. Deviations from these rhythms (e.g., new policies, events) disrupted comfort and reduced usage. Behavioural mapping confirmed sharp temporal shifts in group presence. The survey showed context-specific moderation effects that aligned with these rhythms. Focus groups added interpretive clarity indicates rhythm was both behavioural, and more importantly, part of the meaning-making structure of cohesion.

The interpretive framework shown in Figure 8.1 is an analytical output grounded in the coding and thematic analysis described earlier. It offers an explanation of why social cohesion appears uneven across similar spaces. It does so by demonstrating cohesion is not simply caused by form or frequency of use, but interpreted in situ, through overlapping perceptual, cultural, and temporal mechanisms. Each theme operates relationally. Design is read through norms; belonging is affirmed or denied by rhythm and safety; change is resisted when it threatens affective continuity. These mechanisms help explain why cohesion is volatile and contingent, not uniform. This framework is grounded in qualitative data, generated through coding, mapping, and thematic analysis, and reflects participants' meaning-making processes. On the other hand, it serves to explain, instead of synthesise. While the discussion chapter will return to these mechanisms in cross-method synthesis, here they remain rooted in the qualitative narrative arc. The framework demonstrates that focus group analysis does not merely echo behavioural and perceptual trends, it explains them.

8.4 Interpretations and Theoretical Implications

Bringing these strands together reveals three theoretical propositions that extend beyond existing work on public space and cohesion (Aelbrecht, 2016; Amin, 2008; Cattell et al., 2008b; Mehta, 2019b):

1. **Conditional affordances.** Material design features establish the environmental conditions that make interaction possible, but their translation into socially cohesive outcomes is contingent upon the alignment of situational factors such as prevailing social norms, cultural expectations, and temporal rhythms of use. This helps explain why ostensibly well-equipped spaces may nonetheless underperform in generating inclusivity: affordances are necessary but not sufficient without supportive normative and temporal ecologies (Stevens et al., 2024; Ujang, 2012)‘.

2. **Norm–identity feedback loops.** Informal social regulations both delineate who feels entitled to remain in public space band reproduce visible homogene-

ity of users, thereby reinforcing exclusionary norms over time. Such recursive dynamics, in which identity and normativity co-produce each other, are difficult to capture in static observational or cross-sectional survey data (Qi et al., 2024; Wan et al., 2021). Longitudinal and ecological perspectives are needed to account for these cumulative feedback effects.

3. **Temporal–safety interdependence.** Perceptions of safety and rhythms of use co-evolve: particular times of day or seasons amplify cohesion by supporting visibility, trust, and conviviality, whereas others undermine it through heightened perceptions of vulnerability or social risk. Safety is therefore a temporally situated process that shapes and is shaped by the collective occupancy of space.

4. **Urban–spatial contextual implications.** Experiences of interaction and cohesion are mediated by broader spatial context, including proximity to the city centre, patterns of accessibility, and environmental legibility. These findings consistently show that residential neighbourhoods and city centre environments produce distinct conditional effects, highlighting the importance of embedding analyses of public space within their ecological and spatial systems rather than treating them as interchangeable or isolated settings (Wickes et al., 2019).

These propositions reframe cohesion as an emergent, temporally situated outcome of socio–ecological feedback, rather than as a static property of "good design". They sharpen the explanatory power of the multi-lens framework by making explicit how the spatial–behavioural, social–ecological, and psychosocial dimensions condition one another in real-world contexts.

8.5 Conclusion

In this chapter, we have shown that participants did not experience public space as a neutral backdrop but as a lived and negotiated setting, where material affordances, social norms, perceptions of safety, and temporal rhythms intersected to shape everyday conditions of inclusion and exclusion. Through these accounts, we move beyond identifying spatial–behavioural patterns or statistical pathways to examine how public spaces are subjectively understood, evaluated, and navigated in daily life. the findings demonstrate that physical features are always interpreted through normative and temporal contexts, producing uneven experiences of comfort, belonging, and cohesion.

The contribution of this chapter lies in foregrounding the interpretive and meaning-

making dimensions of public space use. Earlier chapters established the structural and statistical pathways linking design, interaction, and cohesion (Chapter 6 and 7); here, we demonstrated how residents and users themselves read, contest, and inhabit these environments. This perspective is essential, because cohesion is not an automatic output of design provision but a contingent outcome of how spaces are perceived, claimed, and regulated in practice. In doing so, we respond to a potential critique that this research might otherwise privilege form over meaning or treat statistical associations as sufficient evidence of cohesion. By situating physical design within lived interpretation, we show how individual agency and collective norms mediate the extent to which public space enables or constrains sociability.

Our findings also highlight a central policy implication: benches, lighting, or programmed events cannot in themselves guarantee inclusive sociability. They must be embedded within wider symbolic and social contexts that signal welcome, safety, and belonging to diverse groups. For research, this reinforces the importance of combining behavioural observation, survey-based modelling, and qualitative enquiry to capture the full social ecology of public space. No single method alone can account for the dynamic interplay of form, perception, and practice that produces cohesion.

This chapter therefore completes the empirical arc of the thesis. It bridges the material and statistical insights of the behavioural mapping and survey studies with the interpretive accounts needed to understand how cohesion is enacted, negotiated, and sometimes resisted on the ground. The next chapter (Chapter 9) draws these strands together, synthesising across methods and contexts to clarify the mechanisms through which public space contributes to, and at times constrains, social cohesion. In doing so, we situate the findings within broader theoretical and policy debates, and specify their implications for future research and practice.

Chapter 9

Discussion

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9.1 Introduction

The purpose of this chapter is to situate the findings within the wider research and policy landscape. While Chapters 6, 7, and 8 presented discrete empirical analyses, each framed by its own methodological lens, the present chapter integrates those strands into a unified discussion. The aim is to develop a critical dialogue between the evidence we have generated and the conceptual, empirical, and policy debates that shape how public space and social cohesion are understood. In doing so, we articulate the distinctive contributions of this thesis to urban social ecology, environmental psychology, and urban design research, while clarifying its practical relevance for policy and governance. Three considerations guide our approach to discussion.

We approach cohesion as a multi-domain, evolving process. Following the systematic review (Qi et al., 2024) and the theoretical foundation reviewd in the Chapter 2, we specify three interrelated domains: *perceptual* (belonging, safety), *interactional* (frequency and quality of encounters), and *group-based* (demographic visibility). This resolves definitional ambiguity while recognising cohesion as relational and contingent (Forrest & Kearns, 2001; Schiefer & van der Noll, 2017).

Our discussion draws on three components of empirical evidence: behavioural mapping, which revealed ecological patterns of presence and exclusion; survey modelling, which traced conditional and mediating psychosocial pathways; and focus groups, which explored interpretive negotiations of belonging and change. Together these demonstrate that cohesion in urban public space is structured ecologically, conditioned psychosocially, and interpreted narratively.

Social cohesion is often seen as a contested concept. In urban design it is often mobilised to legitimise investment (Carmona, 2019a; Dempsey, 2008); in policy it circulates as both outcome and governance tool (Jenson, 2010; Ratcliffe, 2012); and in sociology it is reframed as a negotiated, sometimes exclusionary process (Amin, 2002; Simmel, 2009). Our findings engage with these competing framings, moving beyond them to sharpen conceptual clarity and advance theory-building across urban social ecology, environmental psychology, and design research.

The chapter proceeds in four parts. Section 9.2 draws upon established theoretical perspectives, clarifying where this research extends, nuances, or challenges frameworks in environmental psychology, urban sociology, and urban design. Section 9.3 develops a sustained dialogue with prior empirical studies across three strands of research: behavioural mapping, survey modelling, and focus groups. Section 9.4 consolidates the thesis' theoretical contributions, including the articulation of conditional, mechanistic pathways, followed by the implications for policy and practice.

The discussion positions this research as a bridge between ecological, psychosocial, and interpretive perspectives, showing how social cohesion emerges through the conditional interplay of design, perception, and interaction.

9.2 Linking to Theoretical Perspectives

The findings speak directly to established theoretical traditions, clarifying how public space mediates social cohesion through ecological, psychosocial, and interpretive mechanisms. In this section, we engage these perspectives to position our work within, and extend beyond, prior frameworks.

9.2.1 Ecological and Hierarchical Perspectives

Building on Lawton and Nahemow (1973)'s social–ecological model and J. Wu (1999)'s hierarchical thinking in urban ecology, the behavioural mapping results show that patterns of presence and co-presence are structured by nested spatial and temporal conditions. By segmenting demographic and relational configurations, we observed how intergenerational encounters concentrated in neighbourhood open spaces, while solitude and marginalisation clustered in particular spatial–temporal niches. These findings reaffirm ecological models that emphasise the interaction of environment, behaviour, and social structure, while also demonstrating how marginalisation is made visible through co-presence ecologies, an extension rarely operationalised in prior urban design studies.

9.2.2 Social Structure and Everyday Encounters

Simmel (2009)'s account of social life as patterned by stable relational forms resonates with the observation of enduring, fleeting, and passive interactions as distinct yet interdependent mechanisms. The survey analyses showed that enduring sociability is the most consistent pathway linking public space features to cohesion outcomes, while fleeting and passive interactions enable indirect awareness and latent ties. These dynamics support Mehta (2019b)'s theorisation of everyday sociability, extending it by identifying which forms of interaction translate into cohesion outcomes across different urban environments. In doing so, we move beyond treating encounters as incidental to show their conditional and mechanistic role in sustaining cohesion.

9.2.3 Urban Design, Affordances, and Contestation

The results also speak to debates in urban design and environmental psychology about affordances and contested space. Carmona (2015)'s account of design governance and Aelbrecht (2016)'s focus on the micro-scale choreography of space highlight how physical form and spatial programming influence patterns of use. The survey findings confirmed that affordances such as pedestrian design and active frontages can enable interaction, yet their effects are significantly conditioned by perceptual factors such as safety, comfort, and belonging. Moderation analysis demonstrated that these perceptions shape the strength and direction of how design features translate into interaction and cohesion outcomes (Wan et al., 2021). Similarly, the focus group data showed how interventions, such as street closures or new landscaping, are embraced, resisted, or reinterpreted depending on established norms of identity and belonging. These findings nuance affordance-based theories (Gibson, 1977) by demonstrating their dependence on psychosocial mediators and user interpretations.

9.2.4 Cohesion, Inclusion, and Policy Frames

This research refines the conceptualisation of cohesion as a dynamic, multi-domain construct. Rather than treating it as a static attribute or diffuse ideal, we follow Forrest and Kearns (2001) and Dempsey (2008) in emphasising its relational, situated, and contingent nature. By operationalising perceptual, interactional, and group-based domains in an integrated framework, we capture the layered processes through which cohesion emerges in practice. The findings demonstrate that cohesion outcomes vary systematically across residential neighbourhoods and city centres, shaped by physical affordances, the moderating role of perception and identity. This approach provides a more precise account than prevailing policy framings, which often regard cohesion as an aspirational condition without attending to its mechanisms (Blake et al., 2008; Cowden & Singh, 2017). We argue that cohesion is better understood as an evolving process structured through the interplay of design, perception, and social interaction, an insight that holds direct implications for urban policy, planning, and post-occupancy evaluation.

9.2.5 An Integrative, Transferable Multi-Lens Framework

Finally, we propose a multi-lens framework that (a) reads public space as an ecological patterning of co-presence (spatial–behavioural lens), (b) embeds those patterns within demographic and institutional systems [1] (social–ecological lens), and

[1] By institutional systems we refer to the formal and informal arrangements through which urban public spaces are structured, governed, and maintained (Carmona & De Magalhaes, 2006;

(c) traces the psychosocial filters through which environments are evaluated and acted upon (psychosocial lens). Each lens is well grounded in its own tradition, and their integration offers a scaling logic, from micro-interaction to meso-configuration to macro-meaning, that is portable across topics.

Beyond cohesion, this framework also offers a methodological foundation for addressing pressing policy problems. For exmaple, it enables systematic assessment of *equity of access*, by linking spatial–temporal patterns of use with demographic visibility and participation; supports evaluations of *environmental justice*, by examining how design affordances and maintenance practices distribute benefits and burdens across groups; informs debates on *urban resilience*, by identifying how usage adapts to pressures such as heat, crowding, or disruption; and strengthens the evaluation of *community interventions*, by tracing how programmes intended to enhance community connectedness translate in everyday sociability and public space use, or tracking how targeted design changes, programmes, or governance measures alter patterns of presence, interaction, and inclusion over time. In each case, the framework translates complex interdependencies into analysable patterns, generating evidence directly relevant for planning, governance, and community development.

Therefore, our findings extend ecological–social thinking (Lawton & Nahemow, 1973; J. Wu, 1999), clarify the relational mechanisms theorised by Mehta (2009) and Simmel (2009), and nuance affordance-based perspectives in urban design (Aelbrecht, 2016; Cao & Kang, 2019). By linking cohesion to lived perceptions, interactional pathways, and group visibility, we provide a theoretically grounded account of how public space functions as an active, contested system of social life.

9.3 Engagement with Empirical Literature

This section situates the empirical findings in relation to existing research, emphasising how the three empirical studies, behavioural mapping, survey modelling, and focus groups, extend and refine established knowledge. Rather than re-presenting results, the aim is to show how they connect to, challenge, and enrich prior evidence in environmental psychology, urban sociology, and urban design.

Mitchell, 2003). In the analysis, institutional systems interact with demographic and spatial factors to condition opportunities for presence, visibility, and sociability in public space.

9.3.1 Behavioural Mapping and the Socio-ecology of Presence

The behavioural mapping study contributes to an urban social-ecological perspective by revealing how co-presence, marginalisation, and demographic visibility are patterned across spatial and temporal contexts. Existing observational studies have long emphasised the vitality of public spaces as arenas for everyday sociability (Askarizad et al., 2024; Ganji & Rishbeth, 2020; T. V. Nguyen et al., 2019). However, most rely on aggregated counts or typological classification, thereby flattening situational variations. By adopting a segmentation strategy that combines demographic, relational, and behavioural attributes within spatio-temporal units, this work extends ecological–social approaches (J. Wu, 1999) and captures what we term *relational ecologies of presence*.

This approach highlights patterns often missed in prior work. For example, we identified the spatial centrality of Asian and Southeast Asian groups within city-centre settings, as well as weekend solitude concentrated among individuals observed alone in open spaces. These findings align with scholarship on urban diversity and marginalisation (Amin, 2008; S. M. Low, 2000), further extend it by providing reproducible, segment-level indicators that link visible presence to structural inclusion. Such an ecological reading moves beyond viewing public space vitality as a uniform quality, re-framing it instead as the emergent outcome of differentiated user configurations. Methodologically, this segmentation-led analysis enhances the scope of post-occupancy evaluation by offering a means to detect underperforming spaces and diagnose relational inequities, an advance beyond perception-only audits or space syntax metrics (Boarin et al., 2018; Hannson & Hillier, 1987; B. Zhang et al., 2023).

9.3.2 Survey Modelling and Conditional Pathways of Cohesion

The survey analysis deepens this ecological view by testing the conditional and mechanistic pathways through which public space features influence social cohesion. The results affirm prior evidence that design affordances such as pedestrian permeability, active frontages, and mixed-use integration facilitate social contact and trust (Francis et al., 2012; Mehta & Bosson, 2021). Yet the moderation models advance this by showing that these effects are not universal: gender, age, and perceptions of safety, comfort, and belonging systematically condition their realisation. For instance, women reported higher sociability gains from active frontages in city centres, while perceptions of belonging amplified the benefits of mixed-use in residential neighbourhoods. Such findings directly engage debates on equity of

design outcomes (Schmidt & Németh, 2010; Southworth, 2014), demonstrating how affordances interact with psychosocial positioning.

Mediation analysis further clarifies mechanisms. Enduring sociability consistently linked design features to cohesion outcomes, with effect sizes exceeding benchmarks for in-situ interaction research (Funder & Ozer, 2019). Fleeting and passive sociability showed more context-specific roles, supporting arguments that indirect awareness and incidental encounters remain important to cohesion (Peters & de Haan, 2011; Peterson, 2017). Crucially, the modelling demonstrates that cohesion emerges through contingent interactional pathways, advancing more precise accounts than policy framings that invoke cohesion as a diffuse social good (Kalra & Kapoor, 2009a; Weedon, 2011).

9.3.3 Focus Groups and Interpretive Negotiation of Cohesion

The focus group findings enrich these ecological and psychosocial perspectives by foregrounding lived interpretation. Participants described public spaces as simultaneously enabling and constraining, reflecting the tensions between comfort, belonging, and exclusion. These narratives resonate with qualitative accounts of contested space use (Peters & de Haan, 2011; Watson, 2009), while the analysis situates them within the structural and behavioural patterns identified in the mapping and survey studies. For example, while observational data revealed solitude as a recurring ecological pattern, focus group discussions clarified how this was experienced: for some, valued as a form of respite; for others, signalling isolation or exclusion.

Importantly, the interpretive evidence complicates the idea of cohesion as a uniformly desirable condition. Some participants resisted the notion of enforced sociability, expressing preference for spaces that allow flexible negotiation of contact. This challenges design paradigms that equate density or activity with social benefit (Gaffikin et al., 2010; Gans, 2002), highlighting the need for pluralistic measures of inclusion (Abed & Al-Jokhadar, 2021; Aelbrecht et al., 2021). At the same time, accounts of safety, familiarity, and identity affirmed the moderating dynamics quantified in the survey analysis, providing convergent evidence that cohesion is conditioned as much by perception as by form.

Taken together, these three empirical strands illustrate how cohesion is structured across ecological, psychosocial, and interpretive registers. Behavioural mapping shows how differentiated co-presence patterns materialise across time and space; survey modelling reveals the contingent mechanisms linking design, perception, and interaction to cohesion outcomes; and focus groups expose how these dynamics are

lived, negotiated, and sometimes resisted. This multi-method integration shows that cohesion is neither predetermined by design nor reducible to perception, emerging instead as a conditional, evolving process shaped by the interplay of structure, interaction, and meaning. By positioning these findings within existing research, we advance both methodological precision and conceptual depth, offering a stronger foundation for urban design and policy interventions aimed at fostering equitable forms of social life.

9.4 Implications for Theory

This section consolidates the thesis' conceptual advances without revisiting empirical detail. We contribute: (i) an ontological re-framing of public space as a *relational field* rather than a neutral container; (ii) an *explanatory grammar* for cohesion centred on conditionality and mechanism; (iii) a clarified, multi-domain *operational ontology* of cohesion; and (iv) a transferable *multi-lens framework* that integrates spatial–behavioural, social–ecological, and psychosocial perspectives.

9.4.1 Public Space as Relational Field

Prevailing accounts alternately privilege morphology (form, layout) (Gehl, 2011; Jacobs, 1961) or symbolism and contestation (M. Harris & Young, 2009; S. M. Low, 2000). Public space is a *relational ecology* in which visibility regimes, behavioural routines, and social ties configure situated opportunities for encounter. This view aligns with socio–ecological theory (Lawton, 1974; J. Wu, 1999) while moving beyond the form/meaning dichotomy by treating patterns of inclusion and marginalisation as emergent properties of coupled person–environment systems. In this ontology, "use" is not a simple function of provision; it is a structured outcome of how populations, rhythms, and affordances jointly organise co-presence.

9.4.2 Conditional Pathways and Mechanistic Processes

Social cohesion is viewed as the result of conditional and mechanistic processes. Design affordances (e.g., permeability, active edges, mixed-use) are conceptualised as latent potentials whose expression is amplified or attenuated by psychosocial moderators—safety, familiarity, comfort, belonging. Mechanistically, this approach distinguishes three interactional channels as analytically separate pathways rather than interchangeable proxies: enduring sociability (repeated, affiliative contact), fleeting sociability (brief exchanges), and passive sociability (co-awareness/adjacency). This differentiation extends environmental psychological models of place relationship (Kahana et al., 2003; J. Kim & Kaplan, 2004) and clarifies how relational forms

theorised in classical and contemporary social theory, i.e., tie formation, weak ties, incidental encounters, map onto cohesion processes (Granovetter, 1973; Petticrew & Roberts, 2006). The key theoretical move is to replace universal claims of "good design yields cohesion" with scope-bounded propositions about *when* and *through which channel* affordances translate into social outcomes.

9.4.3 Cohesion as a Multi-Domain Construct

Furthermore, cohesion in urban public space is developed as a multi-domain construct that is relational, situated, and contingent (Dempsey, 2008; Forrest & Kearns, 2001). Conceptually, this distinguishes three domains: perceptual(e.g., safety, belonging), interactional (frequency and characteristics of encounters), and group-based (demographic composition and visibility). Empirically, these domains are operationalised through five widely recognised outcomes: place attachment, sense of community, social inclusion, trust/social capital, and social networks. This approach clarifies persistent ambiguities by separating cohesion's *domains* from its *indicators*, and by identifying the conditions under which these domains intersect or diverge across different urban contexts.

9.4.4 Propositions and Scope Conditions

To support cumulative theory-building and avoid overgeneralisation, this research states five middle-range propositions:

1. Relational field proposition: Public space functions as a relational field in which co-presence and absence are structured by the joint configuration of affordances, rhythms, and population mix (Lawton, 1974; J. Wu, 1999).

2. Conditionality proposition: The social effects of design affordances are consistently conditioned by psychosocial moderators (safety, familiarity, comfort, belonging); design does not operate independently of these filters (Dempsey, 2008; Forrest & Kearns, 2001).

3. Mechanism proposition: Cohesion arises through distinct interactional channels, enduring, fleeting, passive, that have non-equivalent consequences for attachment, inclusion, trust, and networks (Granovetter, 1973; Simmel, 2009).

4. Context proposition: The strength and composition of cohesion pathways vary systematically by urban context (e.g., residential neighbourhoods vs. city centres), reflecting differences in baseline exposure, stimulus density, and norm regimes.

5. Integrative lens proposition: Combining spatial–behavioural, social–ecological,

> and psychosocial lenses yields explanations that single-lens approaches systematically miss, particularly regarding who benefits and under what conditions (J. Wu, 2013).

These propositions are *scope-bound*. They pertain to open, non-programmed urban public spaces [2] in liberal-democratic [3]; they assume routine conditions (non-emergency) and typical daily/seasonal rhythms; and they concern urban populations with heterogeneous identities. Stating scope explicitly limits overreach and clarifies avenues for extension and test.

The theoretical contribution, stated succinctly, is a shift from "public space as setting" to "public space as system': a relational ecology governed by conditional pathways and mediated through differentiated interactional channels. By clarifying the construct of cohesion and providing an integrative, scalable framework, this thesis supplies concepts and propositions that can travel across cases and inform future empirical and evaluative work without repeating the empirical narratives established earlier.

9.5 Implications for policy and practice

Alongside theoretical advances, our research produces policy-relevant insights into how public space can be governed, designed, and evaluated to foster social cohesion. While policy debates often frame cohesion as a diffuse goal, the findings operationalise it as a multi-domain construct shaped by conditional and mechanistic pathways. This section sets out our key policy contributions across five areas: reframing cohesion policy, targeting design and governance levers, recognising conditionality, institutionalising evaluation methods, and positioning public space within wider agendas of equity and resilience.

9.5.1 Re-framing Cohesion Policy

Existing cohesion strategies in the UK have tended to emphasise broad ideals of inclusion, integration, and trust without specifying how these outcomes emerge in practice (Cheong et al., 2007; Fisher, 2002). These findings advance policy thinking by demonstrating that cohesion is an evolving process shaped by design, perception, and social interaction. By disaggregating cohesion into five domains (place

[2] By "non-programmed" public spaces we mean everyday environments such as streets, squares, and parks where activities are not tightly scripted or managed, allowing informal, spontaneous, and diverse use (Gehl, 2011; Whyte, 1980).

[3] By "liberal-democratic contexts" we mean urban settings where public spaces are broadly accessible, subject to planning and safety regulations, and embedded within governance systems that assume pluralism and civic rights (Amin, 2006b).

attachment, sense of community, inclusion, trust/social capital, social networks), it enables policymakers to target interventions more precisely.

For example, neighbourhood-level investments that strengthen belonging and familiarity may build attachment and inclusion, while city-centre interventions that foster safety and comfort may support trust and sociability. This moves policy beyond generic aspirations towards evidence-based strategies tailored to context.

9.5.2 Targeting Design and Governance Levers

The behavioural mapping analysis identifies spatial segments where exclusion and marginalisation are patterned, such as weekend solitude among certain groups and clustering of minority users in specific open spaces. These insights translate into governance levers for local authorities in terms of addressing the gaps in performance evaluation (Carmona & Sieh, 2008). By treating underperforming segments as diagnostic sites, policymakers can prioritise interventions where equity deficits are most pronounced.

Survey findings further confirm that design features such as pedestrian affordances, active frontages, and mixed-use integration support cohesion only when accompanied by perceptual enablers of safety and belonging. This implies that spatial interventions must be paired with governance measures that shape how spaces are experienced, such as programming, management, or security reforms. Policies focused solely on physical form are insufficient unless supported by measures addressing psychosocial conditions (Gifford, 2007).

9.5.3 Recognising Conditionality

A central policy lesson from the survey study is that spatial affordances do not deliver cohesion universally; their benefits are moderated by socio-demographic factors (e.g., gender, age, ethnicity) and psychosocial perceptions. For instance, residents with lower income respond more positively to pedestrian design affordance enhancement to feel included and develop social capital and trust (Table 7.4); older cohorts derive greater benefit from spatial maintenance and safety improvement to their local public spaces in building a sense of community.

Acknowledging conditionality prevents overgeneralisation and aligns policy with lived realities. Rather than assuming "good design" benefits all equally, interventions should be tested for how different groups experience and activate them. This insight supports more inclusive policy frameworks, particularly in cities grappling with diversity and inequality.

9.5.4 Institutionalising Evaluation Methods

The segmentation-led behavioural mapping and survey modelling provide both evidence and methodological templates that can be institutionalised within policy practice. By embedding spatio-temporal segmentation, demographic visibility, and relational profiles into post-occupancy evaluations, local authorities can move beyond perception-only audits or purely morphological assessments. Similarly, moderation and mediation modelling offers a scalable way to monitor how design interventions interact with perception and identity to produce cohesion outcomes.

These tools can be integrated into urban observatories, smart city dashboards (Kitchin et al., 2015), or community monitoring frameworks (Angeles et al., 2014; Narayan, 2005), allowing policymakers to track change over time and adapt strategies responsively. Importantly, the research methods enable equity-sensitive evaluation, highlighting which groups are included, excluded, or marginalised in specific settings.

9.5.5 Public Space, Equity, and Resilience

Finally, these findings situate public space policy within broader debates on equity and resilience. The relational ecologies revealed in the behaviour mapping study reflect how accessibility, land use mix, and neighbourhood design distribute opportunities for co-presence unequally. Policy interventions must therefore address structural inequalities in access, not just the micro-design of individual spaces.

At the same time, the focus group findings reveal how cohesion is interpreted and sometimes resisted by residents, reminding policymakers that interventions are negotiated rather than imposed. This confirms the importance of co-production and participatory governance, aligning with calls for community-centred urban policy (Innes & Booher, 2004).

In the context of climate change and urban transitions, the conditional pathways identified in our survey modelling also have relevance for resilience. If cohesion depends on interactional mechanisms that are sensitive to perception and identity, then policies seeking to build adaptive capacity must consider how design and governance shape opportunities for repeated, meaningful encounters in times of stress or disruption.

9.5.6 Synthesis

Taken together, these policy contributions provide a sharper and more operational toolkit for cohesion policy. They move beyond abstract ideals to: (1) disaggregate

cohesion into actionable domains; (2) identify design and governance levers; (3) embed conditionality as a principle of intervention; (4) institutionalise innovative evaluation methods; and (5) align public space strategies with equity and resilience agendas.

In doing so, this thesis equips policymakers, designers, and community practitioners with evidence-based frameworks to design, govern, and evaluate public spaces as active systems through which social cohesion is structured and sustained.

9.6 Conclusion

This chapter situates the findings within wider theoretical, empirical, and interpretive debates. In direct response to the conceptual, empirical, and policy gaps identified in the SLR (Chapter 4) and SPR (Chapter 5), we have shown how a cross-method design can operationalise cohesion in public spaces as a structured, measurable, and context-sensitive process.

Behavioural mapping demonstrated that spatial, temporal, demographic, and relational conditions configure patterned presence and absence. Survey modelling revealed conditional and mechanistic pathways linking spatial affordances, perceptions, and interactional forms to cohesion outcomes. Focus groups highlighted the interpretive processes through which residents negotiate safety, belonging, and attachment in everyday practice. Taken together, these strands establish public space as a relational ecology, where inclusion and exclusion are structured yet continually interpreted and contested. Cohesion emerges as an evolving process shaped by design, perception, and interaction.

By consolidating these contributions, the discussion strengthens the theoretical foundations of cohesion research while generating insights relevant for urban policy and governance. At the same time, it highlights the importance of methodological plurality for capturing the layered and contingent nature of cohesion as it plays out in urban environments. The final chapter now builds on these insights by drawing the thesis to a close. It revisits the research questions in light of the cumulative contributions, clarifies the original knowledge generated, reflects critically on methodological and empirical limitations, and identifies directions for future research and practice.

Chapter 10

Conclusion

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10.1 Introduction

This concluding chapter draws together the findings of the thesis and reflects on their significance for theory, method, and practice. The intention is to provide a synthetic perspective that situates the research within wider debates on public space and social cohesion. By revisiting the research questions, integrating the insights across multiple empirical strands, and clarifying the contributions to knowledge, the chapter seeks to demonstrate how the study advances both conceptual understanding and applied approaches to the challenges of inclusion, interaction, and governance in contemporary urban contexts.

The chapter is organised into five sections. Section 10.2 revisits the four research questions, aligning them with the empirical phases of the study to distil their key findings. Section 10.3 sets out the conceptual, methodological, and empirical contributions that the research makes to the study of public space and social cohesion. Section 10.4 offers a reflexive account of the research process, highlighting the challenges, limitations, and learning generated by working across multiple methods and policy domains. Section 10.5 and Section 10.6 outlines research limitations and directions for future research, and we conclude by reflecting on the broader implications of the study for urban scholarship, policy, and practice.

Taken together, this chapter positions the thesis as both a critical review and an empirical inquiry into how the design, governance, and everyday use of public spaces shape, and are shaped by, the pursuit of social cohesion. It highlights that cohesion is a situated process that materialises through the interplay of spatial affordances, social interactions, and policy frameworks. In doing so, the chapter reinforces the relevance of studying public space not merely as a backdrop to social life, instead recognising it as a constitutive arena in which the tensions of inclusion, recognition, and belonging are enacted.

10.2 Revisiting the Research Questions

The research was guided by four interlinked questions, each aligned with a distinct empirical phase and designed to build cumulatively towards an integrative understanding of public space and social cohesion. This section synthesises the answers to these questions, highlighting both their individual contributions and their collective implications.

RQ1: What conceptual, empirical, and policy gaps exist, and how can these inform a cross-method agenda?

The systematic literature review (Chapter 4) and structured policy review (Chapter 5) together revealed persistent fragmentation across conceptual, empirical, and policy domains. Conceptually, cohesion is still treated largely as a normative aspiration, i.e., a desirable state of unity or trust, rather than as an observable process with identifiable mechanisms. Empirical studies remain within disciplinary silos. Urban design research emphasises physical affordances, sociology and psychology highlight lived meanings and perceptions. However, few studies integrate these perspectives to examine how spatial form, behaviour, and meaning interact. Policy frameworks compound these gaps by citing inclusion or cohesion rhetorically while relying on limited indicators such as participation counts or satisfaction surveys, which fail to capture relational or behavioural processes.

The SLR highlighted two priorities for advancing knowledge: the need for greater *standardisation* of indicators to enable cross-study comparison, and the need for *flexibility* to adapt to local socio-demographic and perceptual variation. The SPR further demonstrated that public space is governed through overlapping, sometimes contradictory, policy streams (inclusion, cohesion, capital), framed more as indirect instruments of economic or migration agendas than as cohesive policy domains in their own right. These findings confirmed the importance of moving beyond static design ideals to recognise public space as a dynamic product of governance, layered initiatives, and everyday practices.

In response, this thesis developed a multi-method research design explicitly calibrated to these gaps. It consists of behavioural mapping to capture presence and co-presence, survey models to test mechanisms of moderation and mediation, and focus groups to reveal interpretive and contested dimensions. RQ1 therefore provided the problem-structuring foundation that guided the rest of the research.

RQ2: How do spatial, temporal, demographic, and relational conditions structure patterns of social behaviour and group presence?

Behavioural mapping in Sheffield public spaces (Chapter 6) demonstrated that presence and interaction are structured through identifiable spatial affordances, temporal rhythms, and demographic configurations. Open, legible spaces facilitated lingering and multi-generational co-use, while dense commercial streets encouraged fleeting interactions but marginalised older adults and lone users. Temporal rhythms were

equally important where weekday lunchtimes and summer afternoons produced vibrant interactional fields, whereas evenings and winter months narrowed participation and heightened exclusion.

The segmentation strategy developed in this chapter provided a methodological innovation. By clustering user groups according to life stage, gender, ethnicity, interaction type, and relationship typology, it revealed mid-level regularities that would be obscured under aggregate counts or purely spatial models such as space syntax. This approach highlighted patterns of inclusion (e.g., intergenerational co-use in open spaces) and marginalisation (e.g., solitude among lone users on weekends).

Grounded in socio-ecological theory, this segmentation framework contributes to post-occupancy evaluation by operationalising relational ecologies of presence, that is configurations of co-presence that vary systematically across space and time. It demonstrates that cohesion begins with patterned visibility and participation, making evident the structural and contextual conditions that either enable or constrain interaction.

RQ3: How do public space characteristics, individual perceptions, and social interaction frequency interact to shape social cohesion?

The survey study (Chapter 7) extended the ecological insights by testing mechanistic linkages between environmental conditions, perceptions, and cohesion outcomes across residential and city centre contexts. Moderation analysis showed that design features such as mixed-use integration, pedestrian affordances, and active frontages did not exert uniform effects. Instead, their impact was conditioned by sociodemographic variables (e.g., age, gender) and perceptual moderators (e.g., comfort, belonging). For example, younger adults benefitted more from mixed-use environments, while perceptions of comfort strongly shaped whether pedestrian-friendly design translated into inclusion and trust.

Mediation models identified social interactions as the primary pathways through which design translated into cohesion outcomes. Enduring sociability emerged as the most consistent mediator, linking design affordances to trust, belonging, and inclusion across contexts. Passive and fleeting sociability played more context-specific roles, reinforcing belonging in residential neighbourhoods or enhancing safety perceptions in visually open city centre spaces. Importantly, effect sizes exceeded established benchmarks for in-situ interaction research, highlighting the robustness of these mechanisms.

Together, the moderation and mediation results confirm that cohesion is neither a direct nor uniform product of design. Rather, it emerges from interdependent systems of form, identity, perception, and social engagement. This advances both theory and practice in terms of moving beyond deterministic or purely perceptual models towards integrated, scalable indicators that capture how spatial affordances, perceptions, and identities jointly shape social interaction and cohesion.

RQ4: How do individuals understand, experience, and negotiate social interaction and cohesion in public spaces?

The focus groups (Chapter 8) provided narrative depth, showing that cohesion is both structured by design and mediated by interaction, and actively interpreted, negotiated, and sometimes resisted. Participants emphasised how comfort, safety, and temporal rhythms shaped their willingness to linger, engage, or withdraw. Benches were described as convivial or threatening depending on social context; lighting was understood simultaneously as safety and surveillance. These interpretations reflected how material features become embedded in lived meanings.

The discussions also revealed how broader inequalities filtered into spatial experience. Young people described being policed out of central squares, women noted conditional comfort depending on time of day, and minority ethnic participants highlighted experiences of misrecognition or exclusion. Such accounts resonate with theories of recognition, trust, and reciprocity in urban sociality, reinforcing that cohesion is always situated and contested (Amin, 2008).

Crucially, the focus groups connected the abstract findings of the survey to lived realities, revealing how users translate policy framings and spatial affordances into practices of belonging, negotiation, or withdrawal. They confirmed that cohesion cannot be understood as a static policy goal; it should be recognised as a dynamic accomplishment of everyday urban life.

Table 10.1 illustrates how the four research questions were addressed through successive empirical phases. The design moved from diagnosing conceptual and policy gaps (RQ1), to mapping patterned behaviours in context (RQ2), to testing conditional and mechanistic pathways (RQ3), and finally to interpreting lived meanings and contestations (RQ4). This progression both ensured methodological complementarity and generated a cumulative account of public space and cohesion that is at once conceptual, empirical, and policy-relevant.

Taken together, these four research questions advance a cumulative argument: social cohesion in public space is best understood as an emergent process structured

Table 10.1: Alignment of research questions, methods, and key contributions.

RQ	Focus	Method / Chapter	Key Contribution
RQ1	Conceptual, empirical, and policy gaps	Systematic Literature Review (Ch. 4); Structured Policy Review (Ch. 5)	Exposed fragmentation across literatures and governance; identified lack of evaluative tools; established multi-method agenda calibrated to these gaps.
RQ2	Spatial, temporal, demographic, and relational structuring of behaviour	Behavioural Mapping (Ch. 6)	Developed segmentation framework capturing relational ecologies of presence; revealed patterns of inclusion and exclusion through co-presence profiles beyond aggregate analysis.
RQ3	Interaction of design, perception, and behaviour in shaping cohesion	Survey Study (Ch. 7)	Demonstrated conditional and mechanistic processes: moderation by socio-demographics and perceptions; mediation through social interactions (esp. enduring sociability); advanced scalable indicators of cohesion.
RQ4	Interpretation and negotiation of cohesion in lived experience	Focus Groups (Ch. 8)	Revealed how users interpret, contest, or resist spatial-social dynamics; connected abstract models to lived realities; highlighted situated, contested nature of cohesion.

by spatial affordances, conditioned by perceptions and identities, mediated by interaction, and interpreted through lived experience. The layered design consists of literature and policy review, behavioural mapping, survey analysis, and focus groups, ensured that each method inquired the assumptions and omissions of the others, producing a coherent, multi-scalar understanding of how public spaces shape and are shaped by social cohesion.

10.3 Contributions to Knowledge

This thesis has delivered on the agenda set out in Chapter 1.5, making conceptual, methodological, empirical, and analytical contributions to the study of public space and social cohesion. These contributions are summarised below.

10.3.1 Conceptual Contributions

- **Cross-disciplinary synthesis:** The thesis has advanced a synthesis of spatial, behavioural, and psychosocial approaches to public space and cohesion. The SLR (Chapter 4) demonstrated the persistent fragmentation of conceptual frameworks and outcomes, while the integrated framework developed in Chapter 2 established a basis for linking spatial form, behavioural patterns, and lived perceptions.
- **Reframing cohesion:** Cohesion has been reframed as a process emerging

from the interaction of design affordances, social interaction, and psychosocial meaning, rather than a static outcome or policy aspiration. This reframing underpins the empirical chapters and offers a more dynamic and context-sensitive conceptualisation of cohesion.

10.3.2 Policy Contributions

- **Problem-structuring lens:** The structured policy review (Chapter 5) has shown how social cohesion is framed indirectly through safety, participation, and inclusion. More importantly, it is rarely operationalised through evaluative tools. By applying a problem-structuring perspective, the thesis has demonstrated the absence of consistent measures for social outcomes and highlighted the implications of sectoral silos in governance.
- **Integrative perspective:** The analysis has positioned public space as a cross-cutting infrastructure of cohesion, challenging the dominance of narrow economic or branding objectives. This perspective offers policymakers an alternative framing that recognises relational and behavioural mechanisms as policy-relevant.

10.3.3 Methodological Contributions

- **Segmentation framework:** The behavioural mapping study (Section 3.7) introduced a spatial–temporal segmentation framework that captures relational ecologies of presence. This approach moves beyond aggregate or syntax-based analyses to generate actionable mid-level profiles of inclusion and marginalisation.
- **Triangulated design:** The phased, multi-method design, combining SLR, SPR, behavioural mapping, survey, and focus groups, has demonstrated the value of iterative triangulation in urban research. Each method illuminated different dimensions of the problem, while their integration strengthened the robustness of findings.

10.3.4 Empirical and Analytical Contributions

- **Mechanistic linkages:** The survey study (Chapter 7) identified conditional and mechanistic pathways through which design features and perceptions shape cohesion outcomes. Moderation analyses revealed how demographic and perceptual factors condition spatial effects, while mediation models confirmed the role of social interactions as pathways linking design to trust, belonging, and

inclusion.

- **Lived meaning-making:** The focus groups (Chapter 8) showed how individuals interpret, negotiate, and sometimes withdraw from the spatial–social dynamics quantified in the survey, grounding abstract models in everyday experience.
- **Differentiated insights:** Across contexts, the thesis has generated new empirical evidence about how inclusion and exclusion unfold differently in neighbourhoods and city centres, with implications for design, governance, and policy intervention.

By bridging analytical rigour with lived experience, the thesis has established a flexible yet grounded framework for understanding public space as both a material and symbolic infrastructure of social cohesion. It contributes to academic debates by integrating fragmented literatures, to methodology by advancing segmentation and mixed analytical approaches, and to policy by reframing public space as a governance priority linked to everyday urban life.

10.4 Researcher Reflection and Learning

This research journey has been defined by iteration, adaptation, and the steady development of independence. Each stage of the thesis required a willingness to test, refine, and sometimes abandon approaches in order to ensure conceptual robustness and methodological fit. The process reflected that studying public space and social cohesion is both an intellectual challenge and a practical and ethical endeavour that requires resilience, reflexivity, and constructive engagement with feedback.

The behavioural mapping study, for example, passed through three full versions and a pilot phase before its segmentation framework reached maturity. Iterative revisions were both technical and ethical, as securing approval required multiple adjustments to protocols for observation, anonymity, and representation. Learning from urban ecology, I adapted segmentation strategies through trial and error, gradually building a relational approach to presence and co-presence that could account for demographic visibility and temporal rhythms. Along the way, I engaged with advanced count models such as negative binomial and mixed-effects approaches. Although not all were retained in the final thesis, the process of testing and rejecting models strengthened my statistical reasoning and reinforced the value of methodological transparency.

The survey study likewise demanded multiple redesigns. Developing moderation and mediation frameworks involved learning new forms of bootstrapping, version control,

and model classification, each accompanied by extensive diagnostics. This stage sharpened my problem-solving skills and taught me to balance analytical ambition with interpretive clarity. By moving beyond purely perception-based analysis to link design features, interactions, and cohesion outcomes, I was able to extend the survey's scope without over-extending its claims.

The systematic literature review required almost a year of refinement, including immersion in the PRISMA protocol and the MMAT tool, both new to me at the outset. What began as a standard review evolved into a structured, cross-disciplinary synthesis that laid the conceptual foundations for later empirical chapters. Similarly, the structured policy review demanded a steep learning curve, building on the careful development of research protocol for evidence synthesis. Researching the principles of policy problem-structuring, and developing a classification system capable of addressing governance fragmentation, forced me to engage with policy analysis at a depth not anticipated at the outset.

The focus group study brought a different form of learning. Recruitment posed significant challenges, and facilitation required careful navigation of sensitive topics around exclusion, safety, and belonging. These experiences deepened my understanding of participatory research and sharpened my capacity to adapt methods in response to real-world constraints. They also highlighted the ethical responsibilities of facilitating dialogue in ways that are both inclusive and respectful.

Across these stages, the research process cultivated an ability to take ownership, manage complexity, and respond constructively to feedback.Multiple versions of chapters, analyses, and presentations were not signs of failure; they were integral stages in assembling a coherent whole. Each cycle of feedback and revision advanced both the quality of the research and my own capacity for independent judgement.

Importantly, this trajectory demonstrates the values underpinning the thesis, from persistence in navigating complexity and openness to interdisciplinary exchange, to a sustained commitment to scholarship that is rigorous, transparent, and socially responsible. These were constitutive principles that shaped how challenges were approached, methods refined, and findings interpreted. Over the course of the project, these values translated into concrete forms of professional growth, from developing independence through iterative methodological design, to strengthening problem-solving skills through cycles of trial and adaptation, and learning to engage with critique constructively in order to improve analytical clarity and robustness. By embedding these values in both process and outcome, the research moved beyond abstract debate to generate evidence and frameworks that are conceptually robust, empirically grounded, and of practical relevance for policy and practice.

10.5 Limitations

Every doctoral project requires clear boundaries around its scope. The limitations identified here do not weaken the validity of the findings; they clarify how the results should be interpreted in relation to the research questions and indicate where further development is warranted. They reflect both the conceptual framing and the practical decisions made during the empirical research design, and they provide context for situating the contributions of the thesis within the wider field.

Conceptual Scope

The thesis deliberately focused on public space and social cohesion as intersecting domains rather than engaging comprehensively with broader political–economic structures such as housing markets, welfare reform, or austerity-driven planning. These structural drivers undoubtedly condition how cohesion is experienced and how public spaces are governed (Carmona, 2010a; Forrest & Kearns, 2001). However, addressing them directly would have required a different research design. Instead, the thesis concentrated on inquiring how spatial, perceptual, and relational processes interact in situ. This conceptual delimitation could be critiqued for underplaying structural inequalities, yet it was a strategic decision to prioritise explanatory clarity at the meso-scale of everyday spatial practices.

Methodological Constraints

Methodological limitations emerged across the three empirical studies:

- **Behavioural mapping** was restricted to Sheffield. While this enabled systematic fieldwork and depth of analysis, it limits claims to national generalisability. Further, the observational approach could not capture the subjective experiences of those not present in the observed settings.
- **Survey research** was cross-sectional and recruited via Prolific. This raises two concerns: first, the inability to establish causal relationships, and second, a potential sampling bias toward participants with higher digital literacy or availability. While statistical techniques such as moderation and mediation analysis offered mechanistic insights, the absence of longitudinal or panel data may lead some to question the stability of findings over time.
- **Focus groups** provided interpretive depth but involved relatively small, non-representative samples. Ethical requirements and recruitment constraints necessitated adaptation, which limited diversity in some groups. Although this

reduces external validity, it enhanced reflexivity and revealed situated perspectives often absent from larger-scale studies.

Analytical Boundaries

The analysis also faced boundaries that reflect trade-offs between ambition and interpretability. Experiments with negative binomial and mixed-effects models were undertaken during the analysis of the behavioural mapping dataset. These approaches were ultimately set aside in favour of segmentation and moderation–mediation designs that better aligned with the research questions and data structure. While a quantitatively inclined reader may view this as a missed opportunity, the decision reflects the value placed on methodological transparency, interpretability, and cross-study comparability. Similarly, the decision not to combine all datasets into an integrated statistical model could be critiqued for limiting synthesis, yet this choice preserved methodological integrity and recognised the incommensurability of different data types (observational, perceptual, and narrative).

Governance and Policy Boundaries

From a governance perspective, the thesis did not attempt to capture the full institutional complexity of UK public space management, such as public–private partnerships (Leclercq et al., 2020), devolved decision-making (Adams & Robinson, 2002), or the impact of austerity budgeting on local authorities (Eckersley & Tobin, 2019). Nor did it systematically assess the political economy of urban land and development finance (O'Brien & Pike, 2019). These omissions may be seen as limiting the explanatory depth of the structured policy review. However, the aim was to move away from a totalising account of governance, focusing instead on how cohesion is framed, operationalised, and evaluated across policy spaces.

Practical and Ethical Limitations

Practical and ethical constraints also shaped the research. The behavioural mapping pilot required iterative refinement and multiple ethics applications before fieldwork could begin. This delayed data collection and required narrowing the scope of observation. In the focus groups, recruitment challenges required relying on community contacts and adapting protocols, which limited representativeness while simultaneously strengthening ethical accountability. These adaptations do not signal methodological weakness; they reflect the realities of conducting socially responsible research under real-world constraints.

Strategic Balance

Taken together, these limitations highlight the inherent trade-offs of interdisciplinary urban research, between breadth and depth, generalisability and contextual sensitivity, and methodological ambition and interpretability (Finney et al., 2019; Petts et al., 2008). Making these trade-offs explicit is a demonstration of transparency and reflexivity, thereby strengthening the credibility of the contribution. Certain constraints, such as the absence of longitudinal designs or the limited engagement with structural political, economic forces, point directly to future avenues of investigation. Yet the layered, multi-method strategy adopted here ensured that the findings remain internally valid, triangulated across empirical phases, and theoretically generative.

In acknowledging these boundaries, the thesis also delineates the pathways for further inquiry. Each delimitation, whether of scope, method, or analytical reach, signals where subsequent research can build more comprehensive, comparative, and generalisable accounts. The gaps identified here are invitations: to apply the segmentation framework in diverse urban contexts; to extend survey models through longitudinal or panel designs; to widen participatory work to include harder-to-reach or marginalised groups; and to embed social-ecological systems and psychosocial pathways more firmly within analyses of political–economic and governance structures. These trajectories are elaborated in the following section on future research, where the findings of this thesis are positioned as both a substantive contribution in their own right and a platform for continued interdisciplinary, practice-relevant scholarship.

10.6 Future Research Directions

Building on the contributions and limitations of this thesis, several avenues for future research emerge. These directions reflect both the empirical insights generated and the methodological innovations trialled, and they position the work as a platform for cumulative inquiry.

Empirical Extensions

The segmentation framework developed through behavioural mapping could be tested in other urban contexts beyond Sheffield, both in the UK and internationally. Comparative applications would reveal how patterns of demographic visibility, co-presence, and relational ecologies vary across different governance regimes, cultural settings, and spatial morphologies (Langen, 1969; Lawton & Nahemow, 1973; J. Wu,

1999). Replication of the survey study with more diverse populations, particularly those under-represented in online panels, would strengthen the external validity of the psychosocial pathways identified here (Funder & Ozer, 2019). Extending the focus group methodology to longitudinal or participatory action formats would further illuminate how cohesion is negotiated over time and in response to shifting policy, design, or demographic conditions (Novy et al., 2012; Pemberton, 2008).

Theoretical Development

Future work should deepen the theorisation of the mechanisms linking spatial conditions, perceptions, and relational dynamics. The findings highlight the salience of concepts such as trust, recognition, and belonging, but these remain underelaborated within mainstream urban design and planning literatures (Kearns & Forrest, 2000; Mehta, 2019a). Building stronger connections with political sociology, critical geography, and public health research would enable more robust theorisation of how cohesion operates at the intersection of form, behaviour, and meaning (Chan et al., 2006; Schiefer & van der Noll, 2017). This includes clarifying the role of psychosocial mediators, such as perceptions of safety or comfort, as both outcomes of design and conditions for sociability (Cattell et al., 2008b; Cozens & Love, 2017).

Methodological Innovation

The methodological strategy advanced here, segmentation analysis, moderation and mediation modelling, and participatory interpretation, could be extended in two directions. On the one hand, adopting longitudinal or panel survey designs would enable researchers to examine how psychosocial pathways evolve over time and in response to interventions (Hill, 2009; Howlett et al., 2009). On the other hand, integrating emerging forms of urban informatics, such as sensor data, mobility traces, or participatory GIS, could complement traditional behavioural mapping, providing finer-grained evidence of use patterns while still attending to questions of meaning and experience (Stock, 2018).

Applied and Policy Relevance

Future collaborations with local authorities and design practitioners could translate the frameworks developed here into operational tools. For instance, segmentation-based indicators could be embedded into post-occupancy evaluation protocols, providing planners with evidence on inclusivity and marginalisation in real time (Carmona, 2019a; Dempsey & Burton, 2012). Mediation models linking spatial features to cohesion outcomes could inform cost–benefit analyses of urban interventions,

ensuring that design quality is assessed in aesthetic and economic terms while foregrounding its implications for social outcomes (Gil & Duarte, 2013; Pugalis, 2009). Importantly, engaging policymakers in co-designing evaluative frameworks would strengthen both their legitimacy and practical uptake (Jordan & Turnpenny, 2015; Tosun & Lang, 2017).

In conclusion, the next stages of inquiry should extend the reach of this thesis in three interrelated directions. Outward, by testing the frameworks developed here in diverse geographical, cultural, and political contexts, in order to assess their transferability and reveal how urban ecology and governance structures mediate the relationship between space and cohesion. Inward, by deepening the conceptual analysis of the psychosocial mechanisms at play, particularly the ways in which perceptions of safety, comfort, and belonging interact with structural conditions of inequality to shape person–environment fit. Forward, this approach embeds segmentation, relational modelling, and policy problem-structuring into applied practice, enabling public space evaluation to account for physical affordances alongside the ecological configurations of behaviour and the psychosocial conditions that sustain everyday sociability.

Notwithstanding these research opportunities, pursuing such directions can help consolidate an interdisciplinary agenda for public space and social cohesion that is capable of informing socially transformative practice. They position public space as a dynamic socio–ecological system in which spatial form, behavioural patterns, user perceptions, and lived meaning co-evolve (Larsen, 2013; Lawton, 2013; Sutton et al., 2021). By situating future work within this integrative lens, scholars and practitioners alike can better understand and design the complex interplay of ecological structures and psychosocial processes that underpin inclusive and cohesive urban life.

10.7 Closing Reflections

This thesis, *Social Cohesion in Urban Public Space: A Multi-method Inquiry into Conditional and Mechanistic Pathways*, has argued that cohesion in cities is neither an automatic outcome of co-presence nor a purely aspirational policy ideal. Instead, it is a conditional process, dependent on the alignment of spatial affordances, perceptual cues, and relational dynamics, and a mechanistic process, mediated through observable pathways of interaction, trust, and belonging.

By adopting a multi-method design, the research addressed conceptual, empirical, and policy gaps in complementary ways. The systematic literature review revealed

the fragmented state of knowledge and the absence of consistent evaluative frameworks. The structured policy review demonstrated how governance discourses position public space in abstract terms, without embedding relational mechanisms in their evaluative tools. Behavioural mapping provided ecological evidence of how spatial and temporal configurations shape group presence and interaction. The survey study unpacked conditional and mechanistic pathways through which design, perception, and interaction influence cohesion outcomes. Finally, the focus groups grounded these dynamics in lived narratives, showing how urban dwellers interpret, negotiate, and sometimes contest the social life of space.

Collectively, these contributions affirm the thesis title. Cohesion in urban public space is best understood through a multi-method inquiry capable of capturing both conditional variability and mechanistic pathways. Conceptually, this re-framing moves beyond static notions of "good design" or "inclusive policy" to recognise that cohesion emerges through context-sensitive alignments. Methodologically, it demonstrates the value of triangulation: ecological segmentation, statistical modelling, and participatory interpretation each reveal different dimensions of the same phenomenon, and together offer a more complete account.

The study also emphasises the importance of reflexivity and persistence in conducting interdisciplinary urban research. Navigating conceptual ambiguities, methodological experimentation, and practical constraints was central to producing findings that are rigorous, transparent, and socially meaningful. The thesis thus exemplifies an approach to research that is problem-structuring rather than problem-solving, recognising complexity while striving for clarity and applicability.

In closing, the thesis reaffirms that public space is both a physical and symbolic infrastructure of cohesion. Whether inclusive or exclusionary, its effects are contingent, mediated, and unevenly distributed. By empirically demonstrating these conditional and mechanistic pathways, and by situating them within policy and practice debates, the study contributes to ongoing efforts to design and govern more cohesive, liveable, and equitable urban environments in the UK and beyond.

Appendices

Appendix A

Glossary of Key Terms and Constructs

This appendix provides a consolidated list of key terminology used across the thesis. Definitions reflect how each construct is conceptualised and operationalised within the empirical and theoretical components of this research.

Design Affordances Physical and spatial features that support, guide, or constrain social behaviour.

Spatial Configuration The arrangement and relational structure of built elements that shape movement, presence, and interaction.

Environmental Press Environmental cues and demands that influence behavioural responses and person–environment fit.

Landmarks & Place Identity Recognisable spatial features that foster orientation, symbolic meaning, and attachment to place.

Pedestrian Design Affordances Street- and path-level features that support walkability, movement, and pedestrian comfort (e.g., width, paving, crossings).

Active Frontages Edges of buildings that promote visual permeability, activity spillover, and opportunities for passive and active interaction.

Mixed Use Integration The co-location of diverse functions (commercial, residential, cultural) that generates varied rhythms of activity and co-presence.

Spatial Maintenance & Safety Upkeep, cleanliness, lighting, and oversight con-

ditions that shape perceptions of safety, trustworthiness, and welcome.

Passive Sociability Co-presence without direct interaction, where awareness of others contributes to social atmosphere.

Fleeting Sociability Brief, low-investment exchanges such as nods, glances, or passing acknowledgements.

Enduring Sociability Longer-duration, relationally meaningful interactions between individuals or groups.

Alone (AL) Individuals present without companions.

Intimate (INT) Pairs with close relational ties such as partners or close friends.

Personal (PER) Small groups (three or more) exhibiting coordinated behaviour or conversation.

Social (SOC) Larger or loosely structured groups characterised by broad social engagement.

Walking (W) Mobile activity involving directional or transitory movement.

Lingering (L) Stationary or slow-moving activity indicating dwelling or informal observation.

Sitting (S) Seated activity associated with rest, leisure, or social engagement.

Perceived Safety Affective and cognitive assessment of comfort, risk, and controllability.

Place Attachment Emotional and symbolic bond with an environment.

Perception of Comfort Evaluation of environmental pleasantness, ease, and sensory suitability.

Perception of Familiarity Recognition and cognitive ease generated through repeated exposure or cultural meaning.

Perception of Belonging Sense of being welcome, recognised, or fitting into a social or spatial context.

Social Network Self-reported relational ties, connections, and breadth of supportive interactions.

Social Inclusion Perceived fairness, recognition, and participation within collective urban life.

Place Attachment (Cohesion) A cohesion-specific expression of emotional bonding linked to locality.

Sense of Community Feelings of shared identity, mutual responsibility, and collective orientation.

Social Capital or Trust Interpersonal trust, reciprocity, and cooperative norms that underpin relational cohesion.

Perception of Comfort Used as a moderator to assess how environmental ease conditions behavioural and cohesion pathways.

Perception of Safety Moderates relationships where risk perception conditions interaction and cohesion outcomes.

Perception of Familiarity Moderates how environmental recognition conditions spatial behaviour and belonging.

Perception of Belonging Moderates the extent to which spatial or behavioural variables translate into cohesion outcomes.

Spatial–Temporal Segmentation A hierarchical method for structuring behavioural mapping data by space, time, and demographic attributes.

Moderation A statistical process in which a third variable conditions the strength or direction of a relationship.

Mediation A process through which an independent variable influences a dependent variable indirectly via a mediator.

Note on sources of definitions: The definitions presented here synthesise established usage across urban design, environmental psychology, sociology, and planning (Aelbrecht, 2016; J. Kim & Kaplan, 2004; Lawton & Nahemow, 1973; Mehta, 2019b; Schiefer & van der Noll, 2017; Simmel, 2009; Whyte, 1980), combined with operational definitions adapted for this study's analytical framework. Where terms function as measurement constructs (e.g., social cohesion dimensions, interaction typologies, perceptual moderators), definitions are aligned with how these variables were operationalised in the behavioural mapping schema, survey instrument, and modelling strategy. The glossary therefore reflects both scholarly lineage and study-specific operational clarity.

Appendix B

Inclusion and exclusion criteria for the systematic literature review

Table B.1: Inclusion and exclusion criteria for the systematic literature review.

Criteria	Principle
Inclusion	• The research must have a spatial setting for investigation. It should focus on a form of built environment that incorporates a public space component (e.g., street, open space, marketplace). • The study must investigate features of the urban built environment and evaluate their relationships with or effects on social cohesion outcomes (e.g., social capital, place attachment, sense of community; see Schiefer and van der Noll, 2017). • The study must conduct empirical research and evaluate either behavioural outcomes (e.g., social interactions, use patterns) or perceptual outcomes (e.g., sense of place, environmental perceptions) as measures of social cohesion or closely related behaviours.
Exclusion	• Studies focusing on the production or management process of public space were excluded, as this study centres on the social performance of public spaces. • Articles analysing public space design projects or the design process in relation to social cohesion were excluded due to the distinct methodological requirements to examine how cohesion is embedded in design practice (Aelbrecht & Stevens, 2019). • Studies focused specifically on urban greenspace or neighbourhood built environments were excluded, as previous SLRs have extensively explored these topics in relation to social cohesion (Mazumdar et al., 2018; Wan et al., 2021). • Non-peer-reviewed studies, publications prior to 2000, articles under 3 pages in length, and studies not written in English were excluded.

Appendix C

Inclusion and exclusion criteria for the structured policy review

Table C.1: Inclusion and exclusion criteria for the structured policy review.

Criteria	Principle
Inclusion	• The study must examine UK policy documents, strategies, or frameworks that explicitly engage with the concept of social cohesion. • The study must discuss the conceptualisation or operationalisation of social cohesion in relation to UK policy formulation, delivery, or evaluation. • The study must trace the evolution of UK social cohesion policies in relation to specific time periods, policy shifts, or geographical contexts. • The study must provide critical engagement with social cohesion policies, including interpretation, debate, or critique of the policy language or aims.
Exclusion	• Empirical studies that focus on related domains (e.g., housing, education, public health) without analysing specific UK social cohesion policies. • Evaluations of localised government projects or community programmes, as the review centres on national policy-level frameworks. • Studies that examine time periods prior to 1997, or that do not focus on the UK as the primary geographical context. • Studies that are not peer-reviewed, published before 2000, shorter than three pages, or not written in English.

Appendix D

MerginMap User Interface Demonstration for Behaviour Mapping Data Collection

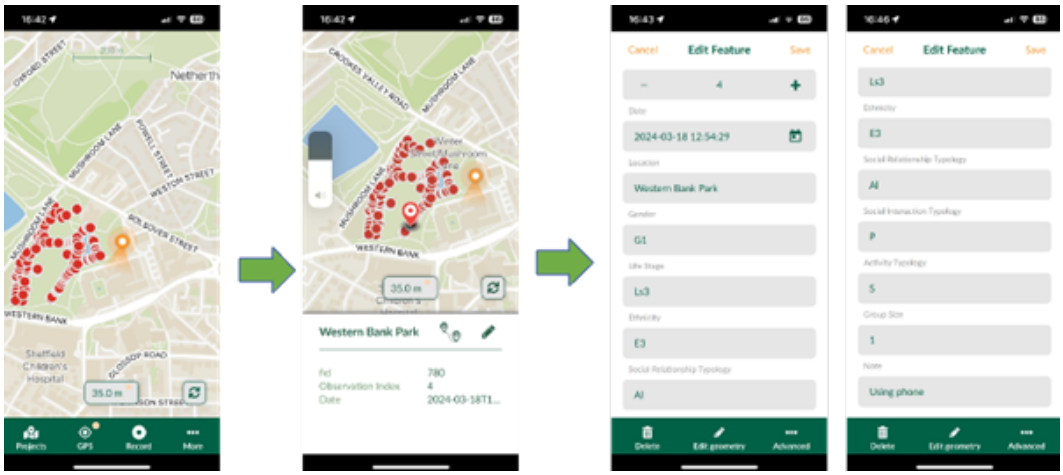

Figure D.1: A demonstration of the developed attributes (features) for the MerginMaps user interface during field observation.

Appendix E

Ethics Approval and Risk Assessment Forms

This appendix includes the risk assessment form for the behaviour mapping study, along with the full ethics approval documents for each empirical phase of the research.

C.1 Behaviour Mapping Ethics Approval

Application 054138

Section A: Applicant details

Date application started:
Tue 30 May 2023 at 08:52

First name:
Jie

Last name:
Qi

Email:
jqi2@sheffield.ac.uk

Programme name:
PhD Information Studies

Module name:
PhD Information Studies
Last updated:
04/07/2023

Department:
Information School [a.k.a iSchool]

Applying as:
Postgraduate research

Research project title:
Understanding the relationship between public space and social cohesion: a behaviour mapping approach

Has your research project undergone academic review, in accordance with the appropriate process?
Yes

Similar applications:
- not entered -

Section B: Basic information

Supervisor

Name	Email
Suvodeep Mazumdar	s.mazumdar@sheffield.ac.uk

Proposed project duration

Start date (of data collection):
Fri 30 June 2023

Anticipated end date (of project)
Mon 26 August 2024

3: Project code (where applicable)

Project externally funded?
No

Project code
- not entered -

Suitability

Takes place outside UK?
No

Involves NHS?
No

Health and/or social care human-interventional study?
No

ESRC funded?
No

Likely to lead to publication in a peer-reviewed journal?
Yes

Led by another UK institution?
No

Involves human tissue?
No

Clinical trial or a medical device study?
No

Involves social care services provided by a local authority?
No

Is social care research requiring review via the University Research Ethics Procedure
No

Involves adults who lack the capacity to consent?
No

Involves research on groups that are on the Home Office list of 'Proscribed terrorist groups or organisations?
No

Indicators of risk

Involves potentially vulnerable participants?
No
Involves potentially highly sensitive topics?
No

Section C: Summary of research

1. Aims & Objectives

The planned research aims to understand the relationship between public space and social interaction.

The study will involve a field study to observe social interactions in public space, categorising social interaction types, public space user profiles, and types of public space (Shamsuddin&Ujang, 2008; Peters&de Haan, 2011).

The researcher will conduct a behaviour mapping exercise (Ghavampour, Del Aguila&Vale, 2017; Mehta, 2019) to spatially map use patterns of public spaces based on the characteristics of social interaction. Behaviour mapping is an objective method of observing behaviour and associated built environment components and attributes (Cosco, Moore, & Islam, 2010). The behaviour maps (Golicnik & Marusic, 2012) will provide a detailed overview of the different types of behaviours observed in different spatial contexts.

2. Methodology

1. Study design:
- Study context: The field study will be conducted in the most popular public spaces located in Sheffield city centre and residential

neighbourhoods located in Ecclesall Road, Hunter's Bar, and Broomhill. The researcher will map the spatial and temporal distribution of different types of social interactions observed across designated time slots and observation sites. Exact locations of the study are provided in attached document (Field study sites and data collection sample).

- Data collection protocol: During the field study the researcher will be holding small scaled maps (20metres) representing the observation sites while dotting/drawing points to that are colour-coded (i.e., orange, yellow, etc.) and shape-coded (i.e., triangle, circle, square, etc.) to represent different types of social interactions observed and the related gender, ethnicity (i.e., white, black, Asian, etc.), and life stages (i.e., life stages are categorised with toddler, child, teen, adult, the elderly).

As reflected by Ganji & Rashbeth (2020), "The mapping process of observation and notation is by necessity contested, working through the tension between attention to nuance and to the requirements of categorisation...It is important to acknowledge what is 'not known' and allow the wider research project to contextualise the act of mapping a specific place and time".

A system of dual broad and detailed coding will be used: an initial code of white/Asian/black/not identified and male/female/not identified, with the option of allocating a more detailed code when information is clearer (for example, linguistic information). A reflection on the positionality of research and its assumptions will be included in the academic outputs (e.g. papers, thesis) arising from this research. Existing studies from our university have also approached this in a similar manner (e.g. Ganji & Rashbeth (2020), Can & Kang (2019)).

The level of detail of recorded information for data collection is confined to individual data points of social interactions by diverse communities. There will be no direct, explicit, private, or sensitive information being collected that is unique to an individual. For the purpose of illustration, two examples of behaviour mapping output from an empirical study conducted by Ganji & Rishbeth (2020) are attached in the supporting document (Field study sites and data collection sample).

Specifically, the researcher will map social interactions (as data points on a map) representing:
a) passive sociability (being alone in the public, i.e., people-watching),
b) fleeting sociability (chance encounters lead to small chitchat, low-intensity short-term contacts, i.e., stopping to watch street performance, petting a dog), and,
c) enduring sociability (meaningful social interactions among people, i.e., family gathering, friends' meet ups).
A minimum of 500 social interaction (cumulative) points is expected to be mapped for each site.

- Study times:
Observations will take place during the months of June 2023 through August 2024. Observations will be spread out to observe each selected public space site during 'Time-out' hours Peak-hours when more people taking the bus or metro going to or coming from work (Aelbrecht, 2016). Time Slots:
• Weekdays: Mornings (8–10 am), lunchtime activity peak (12–2 pm), and after school and working hours (3 – 5pm during summer months; 2 – 3 pm during winter months),
• Weekends: (10 am– 5 pm during summer months; 10 am – 3 pm during winter months); in particular, Saturdays when retail activities are open. There will be no observations taking place when it's dark or when the daylight is gradually going.
In addition, observation will take place on days with good weather in addition to days of special events, i.e., Christmas markets, street markets, Easter holidays, etc. Duration of the observation per visit will be determined by the level of busy-ness and the duration of daylight in addition to following the designated time slots.

2. Study Locations:
The field study will be conducted in the public spaces in Sheffield city centre and residential neighbourhoods located in Eccalsall, Hunter's bar, and Broomhill. Exact locations of the study are provided in the attached document (Field study sites and data collection sample). A selection of public space typologies are determined based on local contexts in terms of representing the variety of environmental settings of:
a) public open space, e.g. Peace Garden, Botanical Garden
b) street, e.g. Ecclesall Road, Sharrow Vale Road,
c) public commercial services, e.g., cafes
d) public facilities, e.g., The Millennium Gallery, Sheffield Central Library
The researcher will be sitting/standing at entrance points, gateways, street furniture, etc. Proposed observation locations with respect to public space types are listed in a table and an annotated map which is included in the supporting document (Field study sites and data collection sample). A list of potential public commercial services such as cafes and public facilities is also included in the supporting documents. The researcher will ask the public commercial service owners (i.e., cafe owner) or public facility managers (i.e., library manager, gallery manager, etc.) for permission to conduct observations. Observations will only take place after the permission is given by the relevant management person(s).

3. Data Collected
• The data points (social interaction points) mapped via behaviour mapping within each site will be digitised using GIS techniques creating an attribute table which contains information including observed location (public space types), observed time, social interaction types, for each observation point.

4. Data Analysis
• Hot spot analysis will be conducted in ArcGIS (spatial data analysis software) with the point data to derive patters of use and social interactions.

Please Note: Ganji and Rishbeth's paper is a good example of similar research done in our University. The researcher herself has professional training and has experience in behaviour mapping when attending master's study in Urban Design and Planning at the Department of Urban Studies and Planning and the Department of Landscape, University of Sheffield.

3. Personal Safety

Have you completed your departmental risk assessment procedures, if appropriate?

Yes

Raises personal safety issues?

Yes

All potential safety and risk concerns have already been discussed with the departmental health and safety officer. Risk assessment has been carried out and cleared by the Departmental Health and Safety Officer and necessary documentation is attached as supporting documents (Risk Assessment for Field Study). As an additional precaution, the following personal safety issues are also considered.

There is a (potential) personal safety issue for the research (potentially) going to unfamiliar areas when the daylight is gradually going or when its after dark. Mitigation solutions are listed below:
a) A pilot study will be conducted at each site with one of the supervisors present. Each pilot observation will last as long as sufficient data is collected, as determined by the researcher. Upon completion of a pilot observation in a location, the supervisor(s) will write a report on any potential issues/problems that arose/may arise. This report will be shared with the (at the time) ethics coordinator at the Information School. The main study will start once the (at the time) ethics coordinator approves the pilot report. The researcher will be accompanied by a fellow researcher or a fellow PhD student during the field observations. The companion will be present in the vicinity, in case any issues arise.
b) The researcher will be checking in and out with the supervisors when conduct each field observation,
c) The researcher will be carrying mobile phone with the battery sufficiently charged at all times,
d) There will be no observation will be taken place when the daylight starts gradually going or when it's dark,
e) The researcher will be carrying university ID and the Letter from the University (please see attached - Field Study Letter) to handout if questioned.

Section D: About the participants

1. Potential Participants

Potential participants are general members of the public who are users of the public place being observed at the time of the study. The participants would be going about their daily life when they would be observed by the researcher.

Given the information will be collected during the field observation (data points only) and the observation will be situation specifically within public contexts, the researcher will be following The University of Sheffield Research Ethics Policy Note no. 2.,Section 9 - RESEARCH IN PUBLIC CONTEXTS AND GROUPS as stated below.
"In certain types of research obtaining consent from every individual present is neither practical nor feasible (e.g. observing behaviour in public places, attending large meetings, attending a music concert or play). Research of this kind stretches the definition of what it actually means to be a human participant in research. In research of this kind researchers should ensure the following:
• that such research is only carried out in public contexts, defined as settings which are open to public access;
• that, if relevant, approval is sought from the relevant authorities;
• that, if relevant, appropriate stakeholders are informed that the research is taking place;
• that specific individuals should not be identified, explicitly or by implication, in any reporting of the research, other than public figures acting in their public capacity (as in reporting a speech by a named individual, for example); and
• that attention is paid to local cultural values and to the possibility of being perceived as intruding upon, or invading the privacy of, people who, despite being in an open public space, may feel they are unobserved."

2. Recruiting Potential Participants

Potential participants are general members of the public who are users of the public place being observed at the time of the study. The participants would be going about their daily life when they would be observed by the researcher. Field observation will only take place in public situations where those observed would expect to be observed by strangers. The researcher would not be engaging or interacting with any participant. It is also not feasible to seek consent as indicated in the The University of Sheffield Research Ethics Policy Note no. 2.,Section 9 - RESEARCH IN PUBLIC CONTEXTS AND GROUPS.

As stated in the previous section and following The University of Sheffield Research Ethics Policy Note no. 2.,Section 9 - RESEARCH IN PUBLIC CONTEXTS AND GROUPS, the researcher will ask the public commercial service owners (i.e., cafe owner) or public facilitate managers (i.e., library manager, gallery manager, etc.) for permission to conduct observation. Observation will only take place after the permission is given by the relevant management team or property owners/authorities.For public commercial places, the researcher will inform the (at the time) attending staff of your study, in case they are asked by a member of the public.

If questioned or challenged by anyone, the researcher will hand out the letter from the university (Field Study Letter) to explain the nature of her research and agree to discard/remove relevant data point(s) of the questioner(s)/challenger(s) from the map when being asked to do so.

2.1. Advertising methods

Will the study be advertised using the volunteer lists for staff or students maintained by IT Services? No

- not entered -

3. Consent

Will informed consent be obtained from the participants? (i.e. the proposed process) No

As can be expected, field observation will be taking place in public situations where those observed would expect to be observed by strangers. The only information will be collected are colour-coded and shape-coded points representing patterns of social interactions by diverse communities. Such information is not detailed, private, explicit, sensitive, nor direct to a unique individual.

The researcher would not be engaging or interacting with the potential participants. It is therefore not feasible to seek consent as indicated in the The University of Sheffield Research Ethics Policy Note no. 2.,Section 9 - RESEARCH IN PUBLIC CONTEXTS AND GROUPS. "In certain types of research obtaining consent from every individual present is neither practical nor feasible (e.g. observing behaviour in public places, attending large meetings, attending a music concert or play). Research of this kind stretches the definition of what it actually means to be a human participant in research."

4. Payment

Will financial/in kind payments be offered to participants? No

5. Potential Harm to Participants

What is the potential for physical and/or psychological harm/distress to the participants?

There is little potential for physical and/or psychological harm/distress to the participants since the only information being collected during the field observation will be the colour-coded and shape-coded data points which does not have any detailed, private, explicit, sensitive information, nor direct that is unique to an individual.

How will this be managed to ensure appropriate protection and well-being of the participants?

Given the level of details of information being collected, it is unlikely there will be any potential for physical and/or psychological harm/distress to participants. To ensure any potential for physical and/or psychological harm/distress to participants is managed, the researcher will refer The University of Sheffield Research Ethics Policy Note no. 2.,Section 9 - RESEARCH IN PUBLIC CONTEXTS AND GROUPS. The researcher will ensure
" that attention is paid to local cultural values and to the possibility of being perceived as intruding upon, or invading the privacy of, people who, despite being in an open public space, may feel they are unobserved."

6. Potential harm to others who may be affected by the research activities

Which other people, if any, may be affected by the research activities, beyond the participants and the research team?

Certain members of the public who take notice of the observational research occurred in his/her situated environmental setting.

What is the potential for harm to these people?

Certain members of the public may find it intrusive if take notice of the observational research occurred in his/her situated environmental setting.

How will this be managed to ensure appropriate safeguarding of these people?

If it is observed that certain members of the public are uneasy about being observed, the observation will be paused until a time when deemed more suitable (i.e. for e.g. when they have left the location, or observations are resumed at a different date/time).

7. Reporting of safeguarding concerns or incidents

What arrangements will be in place for participants, and any other people external to the University who are involved in, or affected by, the research, to enable reporting of incidents or concerns?

There are a number of arrangements are in place for safeguarding concerns as listed below.

1)A pilot study will be conducted at each site with one of the supervisors present. All of the locations identified in the study are locations familiar to the researcher, and are open accessible public places, with daily public life occurring.
2) The researcher and her companion will be checking in and out with the supervisors when conduct each field observation. The researcher will be carrying mobile phone with the battery sufficiently charged at all times and having a companion close by at all times.
3) The researcher will be carrying university id and the Letter from the University (please see attached - Field Study Letter) to handout if questioned, e.g., someone being observed, someone not being observed (member of the public), city ambassador (Peace Gardens). The protocol includes the rationale for this specific piece of work, for example, how the researcher will remove the data points from the map if requested by someone who has been observed, or how the information will be securely stored, for how long, etc.

Who will be the Designated Safeguarding Contact(s)?

Dr Suvodeep Mazumdar, s.mazumdar@sheffield.ac.uk;
Dr Ana C Vesconcelos, a.c.vasconcelos@sheffield.ac.uk

How will reported incidents or concerns be handled and escalated?

Strategy in response to safeguarding concerns includes the following steps.

Step 1: The researcher will be flexible when observing each site and the focus of observation will restricted to social interaction types as stated in the previous section. The observation will be changed to alternative dates or cancelled when the site seems unsafe or prone to incidents.

Step2: The researcher will be with a companion at all time. If anti-social behaviour or illegal activity is observed, the researcher and the companion will strictly follow The University of Sheffield Safeguarding Policy Section 5: Arrangements for enabling safeguarding concerns or incidents to be reported or investigated - principle protocol 5.1 - 5.3.

Section E: About the data

1. Data Processing

Will you be processing (i.e. collecting, recording, storing, or otherwise using) personal data as part of this project? (Personal data is any information relating to an identified or identifiable living person).
No

Please outline how your data will be managed and stored securely, in line with good practice and relevant funder requirements

Throughout the project lifecycle, all research data will be saved in Google drive which can only accessed by the researcher and her supervisors. After the award of PhD has been granted, all research data will be destroyed within 5 years to allow a window for public cation

Section F: Supporting documentation

Information & Consent

Participant information sheets relevant to project?
No

Consent forms relevant to project?
No

Additional Documentation

Document 1122719 (Version 2) — All versions
Risk Assessment for Field Study

Document 1122720 (Version 2) — All versions
Field Study Letter

Document 1122721 (Version 1) — All versions
Study Sites and Data Collection Sample

Document 1122722 (Version 1) — All versions
Reference List

External Documentation

- not entered -

Section G: Declaration

Signed by:

Jie Qi
Date signed:
Tue 4 July 2023 at 14:34

Official notes

- not entered -

C.2 Survey Study Ethics Approval

Application 056443

Amendment - Complete (Submitted on 22/11/2023) | Delete

Description of changes

The original application involved a survey of individual experiences of participants in using their urban public spaces. Upon further discussion, we believe these experiences also involve observing public environments, which needs to be interrogated further. This is why we have added an additional task at the end of the survey, which we expect to take no more than 5 additional minutes. This task will involve observing one image (chosen randomly from a bank of a few images) of an urban scene (taken from publicly available videos - please see next answer) where people are engaging in a range of activities and the participant will be asked questions on a group of people in the image. The task details (and bank of images) are included in the supporting documents (Questionnaire_22112023).

Additional ethical considerations

Do the proposed changes pose any additional ethical considerations?
Yes

Description of how these ethical considerations are addressed
There is no additional ethical considerations in terms of the participants. However, for the task, we will be using images depicting different social interactions in urban public spaces. The images are carefully selected form the university marketing videos which are aimed to depict a vibrant urban city life in Sheffield. The selection process involved identifying a range of demographic characteristics and social interactions and the videos are available publicly and are often used for university promotions and campaigns. We believe this addresses potential ethical considerations because (i) the images are taken from the videos which are already publicly available and widely broadcast (ii) observations will be of individuals who are either willing participants in the videos or are aware of being captured in the videos, (iii) removes the requirement of clicking new photographs to replicate social interaction settings. Other public imagery depicting similar settings were considered, however, this involved blurring or distorting facial features of people - this might disproportionately bias certain findings in this experiment.

Additional risks

Do any of the proposed amendments to the research potentially change the risk for any of the researchers?
No

Supporting documentation revisions

Do the proposed amendments require revisions to any of the supporting documentation? Please note that when uploading new versions of documents which you have previously provided, you should give a description of the document which clearly indicates that this is a new version, e.g. by providing an appropriate version number. It is also helpful to the reviewers if you clearly mark the changes you have made in the document itself (e.g. by highlighting new text or using tracked changes in Word).
Yes

Uploaded documentation

- Information_Sheet_22112023.docx
- Questionaire_22112023.docx
- Consent_Form_22112023.docx
- Questionaire_edited_22112023.docx
- Consent_Form_edited_22112023.docx
- Information_Sheet_edited_22112023.docx

Other relevant information

Decision

Should be approved

Original application

Section A: Applicant details

Date application started:
Tue 25 July 2023 at 18:30

First name:
Jie

Last name:
Qi

Email:
jqi2@sheffield.ac.uk

Programme name:
PhD Information Studies

Module name:
PhD Information Studies
Last updated:
29/07/2025

Department:
Information School [a.k.a iSchool]

Applying as:
Postgraduate research

Research project title:
Understanding the relationship between public space and social cohesion: a survey study

Has your research project undergone academic review, in accordance with the appropriate process?
Yes

Similar applications:
- not entered -

Section B: Basic information

Supervisor

Name	Email
Suvodeep Mazumdar	s.mazumdar@sheffield.ac.uk

Proposed project duration

Start date (of data collection):
Fri 25 August 2023

Anticipated end date (of project)
Sun 25 August 2024

3: Project code (where applicable)

Project externally funded?
No

Project code
- not entered -

Suitability

Takes place outside UK?
No

Involves NHS?
No

Health and/or social care human-interventional study?
No

ESRC funded?
No

Likely to lead to publication in a peer-reviewed journal?
Yes

Led by another UK institution?
No

Involves human tissue?
No

Clinical trial or a medical device study?
No

Involves social care services provided by a local authority?
No

Is social care research requiring review via the University Research Ethics Procedure
No

Involves adults who lack the capacity to consent?
No

Involves research on groups that are on the Home Office list of 'Proscribed terrorist groups or organisations?
No

Indicators of risk

Involves potentially vulnerable participants?
No

Involves potentially highly sensitive topics?
No

Section C: Summary of research

1. Aims & Objectives

The planned research aims to understand the relationship between public space and social cohesion in terms of exploring citizens' social experience in urban public space. To achieve the research aim, a survey study is proposed to understand citizens' perceptions of their social experiences in public space. The survey is developed based on the findings from a systematic literature review effort as a part of the PhD research.

The research objectives are as follows:
1. To investigate citizens' perceptions on the quality of their local public spaces.
2. To identify the sociodemographic and perceptual factors which effect citizens' social experience of public spaces.
3. To explore how citizens' social interactions impact on their experiences of social cohesion in public spaces.

2. Methodology

1. Survey Design:
The purpose of survey design is to collect data enabling statistical analyses in terms of addressing the research questions. Therefore, the survey structure will consist of five sections (please see supporting documents - survey sample).

The purpose of survey design is to collect data enabling statistical analyses in terms of addressing the research questions. Therefore, the survey structure will consist of five sections, in addition to the open-ended questions that invite the respondent to share more information about their perceptions and social experiences (please see supporting documents - survey sample):

• public space characteristics (10 items),
• sociodemographic factors (4 factors),
• perceptual factors (4 factors),
• social interaction (6 items), and

• social cohesion (5 items).

Specifically, the 4- and 5- point likert scales will be utilised as the measures for most of the items in order to ensure the respondents interpret the survey items effectively and acheive high internal consistency and test-retest reliability (Simms, Zelazny, Williams, & Bernstein, 2019; Jebb, Ng, & Tay, 2021). Specifically, ethnic minority utlises binary scale whilst age is considered as a categorial item with a 5-point scale adopting the operational approach of socioeconomic status developed by (Violán, et al., 2014) to represent different life stages of urban dwellers.

2. Study Design
• Data collection Period:
The survey will be distributed over a period of 12 months to maximize the number of survey responses are collected.
• Platforms selected for participant recruitment and survey distribution:
Survey will be distributed via Prolific. The following protocols will be applied:
1) external URL of the survey will be integrated to Prolific and an additional question will be added to the survey to record the participants' unique Prolific IDs for quality control purposes;
2) participants located in the UK and US will be recruited to ensure a sufficient number of potential participants;
3) the study distribution will be a representative sample to make the research findings more generalisable;
4) no prescreeners will be applied on the ground that public spaces are open and accessible to the general public and to avoid introducing potential bias.

3. Participants
A minimum of 500 quality responses is expected in terms of obtaining effective sample size for mediation and moderation analysis(Pan, S., Miao, & Yuan, 2018; Askari, Soltani, & Ahmad, 2015).

4. Data Collected
• Quantitative/statistical data will be generated from the objective survey questions.
• Qualitative data will be generated from the open-questions and semi open-questions.

5. Data Analysis
• The quantitative data collected will be used for conducting mediation and moderation analysis in Python. The moderation and mediation analysis results will be compared with the text analysis findings in terms of identifying areas of agreement and conflict.
• The qualitative data generated from the open-questions will be analysed using sentiment analysis and thematic analysis with Python libraries.
• The finding of this research stage The finding of this research stage will complement the findings from the ongoing behaviour mapping study (ethics approval ID: <054138>), in terms of revealing discrepant findings and enhancing the overall quality of the evidence base.

3. Personal Safety

Have you completed your departmental risk assessment procedures, if appropriate?

Not Applicable

Raises personal safety issues?

No

The survey will be distributed online and no sensitive information will be collected during the study.

Section D: About the participants

1. Potential Participants

Participants will be identified from volunteered participaton as a result of recruitment via Prolific platform.

2. Recruiting Potential Participants

Participants will be recruited via Prolific platform.

2.1. Advertising methods

Will the study be advertised using the volunteer lists for staff or students maintained by IT Services? No

- not entered -

3. Consent

Will informed consent be obtained from the participants? (i.e. the proposed process) Yes

The information sheet and consent form will be uploaded and integrated to the survey via prolific platform as part of the survey study right

at the beginning and give the participants an opt-in and opt-out option.

4. Payment

Will financial/in kind payments be offered to participants? Yes

The researcher will be applying for PGR Fund at the Information School to support the survey study.

The researcher is hoping to raise a sum of £700 via PGR Fund at the school given that 1)the survey will take 7-10minutes to complete, 2) the minimum wage in the UK is £10.42 per hour, and 3) a minimum of 500 responses is desired for the study.

5. Potential Harm to Participants

What is the potential for physical and/or psychological harm/distress to the participants?

There will be no potential for physical harm but potential psychological distress as the participant may recall unpleasant experience in urban public spaces during filling in the survey.

How will this be managed to ensure appropriate protection and well-being of the participants?

The participants are informed in the information sheet (please see supporting documents - information sheet) that participants are free to withdraw from the study if they feel uncomfortable.

"Should you feel uncomfortable and in distress while recalling your experiences in urban public space, you can neglect such information when filling the survey or completely withdraw from the study".

6. Potential harm to others who may be affected by the research activities

Which other people, if any, may be affected by the research activities, beyond the participants and the research team?

There will not be other people affected by the research activities, beyond the participants and the research team.

What is the potential for harm to these people?

Not applicable.

How will this be managed to ensure appropriate safeguarding of these people?

Not applicable.

7. Reporting of safeguarding concerns or incidents

What arrangements will be in place for participants, and any other people external to the University who are involved in, or affected by, the research, to enable reporting of incidents or concerns?

I mentioned in the participants' sheet the following statement.
" If you feel that your personal data has not dealt correctly as per information provided in this sheet, or wish to raise any concerns/ or complaint about the research, you can first discuss this with the principal researcher via this email address (jqi2@sheffield.ac.uk) or her supervisors Dr Suvodeep Mazumdar, s.mazumdar@sheffield.ac.uk and Dr Ana C Vesconcelos, a.c.vasconcelos@sheffield.ac.uk. Your complaint will be dealt with respectfully, and we will respond appropriately and as soon as possible. However, if you feel that your complaint has not been dealt with appropriately, then you can email the research supervisor via their email address. In addition, if you wish to complain about any other serious problems that may arise during or following your participation in the research, you can contact the University's 'Registrar and Secretary'."

Who will be the Designated Safeguarding Contact(s)?

Dr Suvodeep Mazumdar, s.mazumdar@sheffield.ac.uk; Dr Ana C Vesconcelos, a.c.vasconcelos@sheffield.ac.uk

How will reported incidents or concerns be handled and escalated?

Participants, upon request, will be provided with an information sheet which details the safeguarding concerns.

Section E: Personal data

1. Use of personal data

Will any personal data be processed or accessed as part of the project?
No

Are you sure that no personal data will be processed or accessed during your project?
Yes

Section F: Supporting documentation

Information & Consent

Participant information sheets relevant to project?
Yes

Document 1127073 (Version 1)	All versions
Document 1127422 (Version 1)	All versions
Document 1128798 (Version 1)	All versions

Consent forms relevant to project?
Yes

Document 1127074 (Version 1)	All versions
Document 1127423 (Version 1)	All versions
Document 1128799 (Version 1)	All versions

Additional Documentation

Document 1127424 (Version 2) Survey Sample 08082023	All versions

External Documentation

- not entered -

Section G: Declaration

Signed by:
Jie Qi
Date signed:
Tue 24 October 2023 at 12:24

Official notes

- not entered -

C.3 Focus Group Ethics Approval

Application 064399

Section A: Applicant details

Date application started:
Mon 19 August 2024 at 12:00

First name:
Jie

Last name:
Qi

Email:
jqi2@sheffield.ac.uk

Programme name:
PhD Information Studies

Module name:
PhD Information Studies
Last updated:
25/09/2024

Department:
Information School [a.k.a iSchool]

Applying as:
Postgraduate research

Research project title:
Understanding the relationship between public space and social cohesion: a focus group / interview study

Please provide details of how your project has been academically reviewed
- Supervisor feedback
- Confirmation review

Similar applications:
- not entered -

Section B: Basic information

Supervisor

Name	Email
Suvodeep Mazumdar	s.mazumdar@sheffield.ac.uk

Proposed project duration

Start date (of data collection):
Thu 19 September 2024

Anticipated end date (of project)
Thu 19 December 2024

3: Project code (where applicable)

Project externally funded?

No

Project code
- not entered -

Suitability

Takes place outside UK?
No

Involves NHS?
No

Health and/or social care human-interventional study?
No

ESRC funded?
No

Likely to lead to publication in a peer-reviewed journal?
Yes

Led by another UK institution?
No

Involves human tissue?
No

Clinical trial or a medical device study?
No

Involves social care services provided by a local authority?
No

Is social care research requiring review via the University Research Ethics Procedure
No

Involves adults who lack the capacity to consent?
No

Involves research on groups that are on the Home Office list of 'Proscribed terrorist groups or organisations?
No

Indicators of risk

Involves potentially vulnerable participants?
No
Involves potentially highly sensitive topics?
No

Section C: Summary of research

1. Aims & Objectives

The research aims to understand the relationship between public space and social cohesion.

The study will involve a set of focus group studies in addition to conducting interviews with public space users and communities. This methodological approach allows for a holistic understanding of citizens' and communities' perceptions on their experiences of social interaction and cohesion in public spaces enabling individual and collective perspectives. The study outcome will contribute to our understanding in the barriers and motivations for people engage social interaction in public spaces and how their experiences of social cohesion (i.e., sense of community, social inclusion and integration, place attachment, etc.) unfold in public spaces.

2. Methodology

1. Study design:
- Focus Groups: a set of 90 minutes focus group studies will be held in bookable meeting rooms in university buildings. However, if accessibility or travel to the university buildings is a concern, the interviews will be arranges online. The meeting instructions are set out in

advance to be made aware of the participants to avoid any inappropriate discussions or possible tensions. A list of questions of the study focus (no contentious questions) (Please see supporting documents.) will be given prior to the meeting to make sure the focus group are not deviate from the topics. The researcher has had formal training in participatory research during her undergraduate study in Sheffield Hallam University and from undertaking the Doctoral Development Programme in her first year of PhD study. She has experiences in working with local communities in Sheffield such as the Walkley community, the Heeley City Farm community.

- Interviews: a set of 25mins to 30 mins interviews will be conducted to understand their individual social experience in public spaces. The interviews will take place in the bookable meeting rooms in university buildings or being held online when it is necessary. A list of interview questions will be given to the participant in advance to ensure they are ready for the interviews. The researcher has developed sound interview skills completing the dissertation research project on urban green space during her master study at our University.

2. Participants: up to 20 participants will be recruited, (up to 20 participants will take part in the focus group studies and 10 interview participants will be drawn from the 20 focus group participants) to include the gender groups (males and females), age groups (18-20, 30-44, 45-64 and 65 and over) and race groups (White, Black, Asian, and other racial groups). A mixture of university of students and local community members will be recruited via the Sheffield volunteer email lists, the researcher's contacts with local communities, university volunteer email lists.

3. Data Collection: the data collected will include audio recordings and additional meeting notes.The data will be saved and backed up to Google drive which can only be accessed by the researcher and her supervisors. In addition, within 2 days of the event, until then, the dictaphone will be stored in locked cabinets of the PGR lab, accessible to the researcher. The data, once uploaded to google drive will be deleted from the dictaphone.

4. Data Analysis: The audio will be in mp3 format and recorded using dictaphone and the transcripts will be created using NVivo. Transcripts will be checked against the audio recording for accuracy. Transcripts will be analysed using NVivo using the method of thematic analysis (Keane, Lincoln, & Smith, 2012). Methodological elaborations of Grounded Theory research (e.g. situational analysis) (Vasconcelos, Sen, Rosa, & Ellis, 2012) will be used to manually analysed the scripts to ensure rigorous analysis findings.

Information Sheets and Consent Forms for the focus group and interviews are included in the supporting document section.

3. Personal Safety

Have you completed your departmental risk assessment procedures, if appropriate?

Not Applicable

Raises personal safety issues?

No

The focus group study and interview study will be conducted strictly following the meeting agendas/questions and interview questions to avoid any insensitive discussions and potential tensions occur. The researcher's training and research experience in conducting participatory research and interviews enables appropriate responses are made and protocols are followed if needed. Drawing on experience, the following protocols will be followed when selecting participants and conducting the interviews/focus groups and provide the brief to be shared with participants, in order to avoid potential insensitive discussion or tension: 1) carefully select participants who can contribute meaningfully to the discussion, 2) obtain informed consent from participants, explaining the topic, study context, and the protocol to follow if uncomfortable situations arise, 3) instruct participants to stay on topic and avoid straying into unrelated or potentially inappropriate areas

Section D: About the participants

1. Potential Participants

Participants will be identified based on whether they have been to or used any of the urban publics spaces located in Sheffield such as the Peace Gardens, Western Bank Park, Division Street, Botanical Gardens, and Ecclesall Road.

2. Recruiting Potential Participants

The potential participants will be approached and recruited via Sheffield university emailing lists, Sheffield Volunteer lists, and Sheffield local communities using the researchers' contacts in Heeley City Farm and Walkley Community Centre. I will be using my University of Sheffield email address.

2.1. Advertising methods

Will the study be advertised using the volunteer lists for staff or students maintained by IT Services? Yes

The Sheffield volunteer lists such as Voluntary Action Sheffield, Sheffield Volunteer Centre allows for recruitment of local residents whilst potential contacts with local communities enable a better understanding of the indigenous perspectives on social interaction in public spaces.

3. Consent

Will informed consent be obtained from the participants? (i.e. the proposed process) Yes

Information Sheets and Consent Forms will be sent to participants via emails from the researcher's university of Sheffield email address. The focus group study and interviews will only proceed when all consent forms and information sheets are filled in and signed by respective participants.

4. Payment

Will financial/in kind payments be offered to participants? No

5. Potential Harm to Participants

What is the potential for physical and/or psychological harm/distress to the participants?

We do not envisage any physical and/or psychological harm/distress to the participants. The topics of discussion are daily activities of the participants on how they engage with public spaces. The focus groups and interviews will be conducted within university buildings, with meeting all accessibility requirements.

How will this be managed to ensure appropriate protection and well-being of the participants?

Focus group meeting and interviews will be terminated if any uncomfortable experiences in public spaces is recalled or any insensitive discussions occur.
The researcher will be make clear that to discuss confidentiality with the participants at the start of the meeting. In the consent form the participants will also be required to agree to respect what others say in the group and agree to confidentiality regarding what is discussed in the session.

6. Potential harm to others who may be affected by the research activities

Which other people, if any, may be affected by the research activities, beyond the participants and the research team?

The participants will take part in interviews and focus groups to discuss their experience in public spaces, there is no foreseeable effects on people beyond the participants and the research team.

What is the potential for harm to these people?

We do not envisage any physical and/or psychological harm/distress to people beyond the participants and the research team.

How will this be managed to ensure appropriate safeguarding of these people?

We do not envisage any physical and/or psychological harm/distress to people beyond the participants and the research team. The topics of discussion are daily activities of the participants on how they engage with public spaces. The focus groups and interviews will be conducted within university buildings, with meeting all accessibility requirements.

7. Reporting of safeguarding concerns or incidents

What arrangements will be in place for participants, and any other people external to the University who are involved in, or affected by, the research, to enable reporting of incidents or concerns?

Any information that is unique to identify a public member will be kept anonymous.

Who will be the Designated Safeguarding Contact(s)?

Dr Suvodeep Mazumdar, s.mazumdar@sheffield.ac.uk;
Dr Ana C Vesconcelos, a.c.vasconcelos@sheffield.ac.uk;
Departmental ethical team contact: ischool_ethics@sheffield.ac.uk

How will reported incidents or concerns be handled and escalated?

By discussing the reported issues internally with my supervisors. And, if needed, the reported issues or concerns can be raised and escalated to the university’s ethics committee.

Section E: Personal data

1. Use of personal data

Will any personal data be processed or accessed as part of the project?
Yes

Will any 'special category' personal data be processed or accessed as part of the project?

Yes

Provide the number of people whose personal data you expect to process or access.
20

Approximate number of people with special category personal data
20

2. Managing personal data

Which organisation(s) will act as data controller(s) of the personal data?
University of Sheffield only

Who will have access to the personal data?
the researcher and her supervisors

What measures, processes and/or agreements will be put in place to manage the personal data?
All the data will only be saved and backed up at Google Drive and shared with the supervisors of researchers. Personal data of the interviewee will be pseudonymised by storing personal details (e.g., name) separately and creating a 'key' or 'code' to enable re-identification. To be specific, the participant name will be replaced immediately after the interview by assigning a random code/or number which makes it difficult for the stranger to identify the true identity of the participants. The data will be generalised to remove certain identifiers without compromising the data's accuracy. Likewise, all data will be anonymized, and the researcher will ensure that the participants are aware of this and that the dissertation and related publications do not reveal any name, job title, organisation or identifiable data that could lead to the identification of any participant.

Will all identifiable personal data in digital or physical format be destroyed within a defined period after the project has ended?
Yes

When will the identifiable personal data be destroyed?
One year after the award of PhD has been granted, all research data will be destroyed.

3. Third-party services

Will any external third-party services not provided by the University be used to process or access personal data during the project?
No

4. Security of computers, devices and software

Will personal data be processed or accessed on any computers or devices that are not managed by the University of Sheffield?
No

Will any software not approved by the University of Sheffield be used to process or access data?
No

Will any software be written or developed in order to process or access the personal data?
No

Section F: Supporting documentation

Information & Consent

Participant information sheets relevant to project?
Yes

Document 1143620 (Version 4)	All versions
Document 1143619 (Version 1)	All versions
Document 1143727 (Version 2)	All versions

Consent forms relevant to project?
Yes

Document 1143621 (Version 1) All versions
Interview Study CF

Document 1143622 (Version 1) All versions
Focus Group CF

Document 1143872 (Version 1) All versions

Additional Documentation

Document 1143624 (Version 2) All versions
Focus Group Agenda and Questions

Document 1143625 (Version 2) All versions
Interview Questions

External Documentation

Please review the files of Information Sheets for focus groups and interviews, focus group agenda and questions, and interview questions dated on the 6th September 2024.

Section G: Declaration

Signed by:
Jie Qi
Date signed:
Mon 23 September 2024 at 11:52

Official notes

- not entered -

C.4 Risk Assessment Form – Behaviour Mapping Study

The University Of Sheffield.

Fieldwork Risk Assessment Form

Examples of Potential Hazards

1.	Physical and personal safety (e.g. personal attack, abuse, assault, getting lost)	**2.**	Wildlife attacks (e.g. bears, monkeys, boars, etc.)	**3.**	Exposure (e.g. weather leading to injury or illness)	**4.**	Methods-related (e.g. lone working, interviews in private spaces)	**5.**	Security (e.g. theft)
6.	Accommodation (e.g. security, emergency procedures/fire risk)	**7.**	Local customs (e.g. religious practices, dress codes)	**8.**	Security of data and prevention of harm to participants	**9.**	Economic (e.g. loss of bank card, theft of cash)	**10.**	Legal (e.g. specific local laws and customs, alcohol prohibition)
11.	Political stability & Terrorism (protests, civil unrest, terrorist activities)	**12.**	Transport and vehicular (e.g. local driving conditions, excessive driving hours, road-worthiness of vehicles, remote or hazardous terrain, check validity of licence & insurance)	**13.**	Food and drink (e.g. safety of local water, allergic reactions from air or food, food poisoning)	**14.**	Illness, Disease (e.g. malaria, rabies, other infectious diseases)	**15.**	Climate, natural disaster (e.g. earthquakes, tsunami)
16.	Naturally occurring poisons (e.g. snakes, spiders, plants etc.)	**17.**	Working in an isolated area (problem in summoning help when in difficulty)	**18.**	Terrain (slips, trips and falls)	**19.**	Allergies (allergic reactions causing discomfort and in severe cases anaphylactic shock		

Instructions for assessing the risks

1) Complete column 1 by listing specific hazards foreseen for your activity. The above examples should be considered, but please note, this is not an exhaustive list and there could be other risks that are more relevant to your planned work or location which need to be considered.
2) List the potential outcomes of the hazards you have identified in column 1.
3) Using the risk matrix below, give each identified hazard a score between 0 – 3.
4) Add up your initial risk level and discuss this with your Supervisor
5) If the risk has been identified as 'high', complete column 4 detailing the control measures you will put in place to reduce the risk to an acceptable level
6) Complete column 5 giving each activity a score of 0 – 3 taking into consideration the control measures you have put in place
7) Again discuss this with your Supervisor

Date of planned fieldwork:	**Start: 01/02/2023 Finish: 31/01/2024**
Name of supervisor:	**Suvodeep Mazumdar, Ana C Vasconcelos**
Short summary of fieldwork:	Fieldwork includes systematic field observation, behaviour mapping, and on-site semi-structure interviews. The field study will be conducted in the most popular public spaces located in Sheffield city centre and residential neighbourhoods, i.e., peace garden, Ecclesall road, independent shops in Broomhill, Heeley city farm, etc. The researcher will observe the characteristics of social interaction in public space.

Column one: Hazard (Detail specific hazards foreseen for this activity)	**Column two: Potential consequences** (Detail potential outcomes of hazards)	**Column three Initial Risk Level** (insert numerical value 0-3)	**Column four Minimise risk by:** (What control measures will you take to reduce the level of risk?)	**Column five Residual risk**
Visiting unsafe/unfamiliar sites, i.e., deprived regions, neighbourhoods with mixed ethnicity, neighbourhood streets with heavy traffic	1, 4, 7, 12	2	Discussing potential mitigation solutions with the department's health and safety offices, i.e., recruit companion field researcher when visiting the sites.	1
Visiting observation sites when after dark	1, 12, 18	3	Discussing potential mitigation solutions with the department's health and safety offices, i.e., recruit companion field researcher when visiting the sites, adjusting field visit time.	1

		Initial risk level:5		**Residual risk level:2**

Declaration

In submitting this form, I acknowledge that I:

1. Have completed the risk assessment to the best of my knowledge.
2. Have been provided with appropriate safety information and instruction for the fieldwork by my first supervisor.
3. Have read and will take account of the guidance above and in 'The Management of Health and Safety on Fieldwork and Other Off-campus Activities Policy and Guidance.'
   (https://hs.shef.ac.uk/attachments/333?updated=1476266384)

Student Name: ……Jie Qi……..Signed:……Jie Qi……..

Supervisor Name: ……Suvodeep Mazumdar…… Signed:……S.Mazumdar……

Date: 05.12.2022

*Immunization/Vaccination.

Immunization against tetanus is recommended for all persons working in rural environments and is particularly important for those performing manual tasks in contact with soil, animals or if the fieldwork or other off-campus activities could result in exposure to certain pathogenic organisms. The University's Occupational Health Service can offer advice and provide a vaccination programme for staff.

Students should make similar immunisation arrangements through their GP.

Appendix

Risk Matrix

Guide to Risk Level Rating

For each risk identified in your initial risk assessment (each row in the table on page 10) plot a score using the matrix below, which multiplies severity by probability. Any score of 3 or more must entail further control measures to be put in place or even cancellation of the activity as per the final risk rating chart below.

Risk Score = S x P		SEVERITY OF HARM (S)			
		Very Minor = 0	Minor = 1	Serious = 2	Fatal = 3
PROBABILITY (P)	Very Unlikely = 0	0	0	0	0
	Unlikely = 1	0	1	2	3
	Possible = 2	0	2	4	6
	Likely = 3	0	3	6	9

Final Risk Rating	High (H)	6-9	Activities that are High must not start (or will need to be suspended), without appropriate controls in place to reduce the risk to an acceptable level.
	Medium (M)	3-5	Lesser priority risk should be assessed to see if further control measures can be applied to reduce to low risk.
	Low (L)	0-2	No further action is required.

C.5 Focus Group Agenda and Questions

Focus Group Agenda and Question:

1. Introduction -- 15 mins
   - Review the purpose of the meeting – the researcher will give a short brief on her research interests in understanding people's social experiences in public spaces and what social cohesion means in the context of engaging in social interactions in public spaces.
   - Attaining agreement on mutual respect and understanding during the discussion
   - Outline structure of the meeting and how information will be used
   - Participant introduction - participants will be invited to give a brief introduction about their background and their experiences with public spaces.

2. Questions for discussion -- 60 mins

   - What public spaces do you like to go to?
   - What social interactions you engage in those public spaces?
   - What experience of social cohesion (social values) you attain from using public spaces?
   - What are the motivations and barriers for you to engage in social interaction and experiencing social cohesion in public spaces?
   - What is your observation of others who engage in social interactions in the public spaces?
   - What impacts public spaces have on your experience of social interaction and cohesion?

3. Summary of the meeting -- 15mins
   - Meeting summary
   - Additional information be added to the questions
   - Thank the participants

Focus group agenda and guiding questions used during the session.

Appendix F

Full List of Studies Included in the Systematic Literature Review

This appendix provides the complete list of 63 studies reviewed in the systematic literature review (Qi et al., 2024). The table records key details of each study, including location, methods, sample, public space typology, outcomes assessed, and analytical techniques.

Table F.1: Full list of studies included in the SLR.

ID	Author(s), Year	Location	Methods	Sample	Typology	Outcomes Assessed	Analysis
P1	Abed & Al-Jokhadar (2021)	Jordan	S, I	Residents, architects, developers; n=197 (S), n=30 (I)	FP, PF	Social sustainability (6 items, Housing Associations' Charitable Trust)	Spatial analysis; correlation analysis; qualitative data analysis
P2	Al-Ali et al. (2020)	UAE	S	Residents; n=145	POS	Social capital (6 items, Ross & Searle, 2019)	Regression analysis
P3	Amran & Fuad (2020)	Indonesia	O	General population; n=4	FP	Social interaction (between strangers in transit space)	Site analysis
P4	Askari et al. (2015)	Malaysia	S, O	General population (aged 14–50); n=400	POS	Engagement (social, environmental, physical needs)	Principal component analysis
P5	Askarizad & Safari (2020)	Iran	O	General population	POS	Behavioural pattern (activity types; temporal and spatial distribution)	Behavioural mapping; GIS analysis
P6	Can & Heath (2016)	Turkey	Q, O	Residents; n=340 (Q), n=3 (O)	FP	Social interaction (activity types; temporal/spatial distribution)	Space syntax; correlation analysis
P7	Cao & Kang (2019)	UK, China	O	General population; n=1297	POS	Social relationship (distance types per Gehl/Hall social distance theory)	Behavioural mapping
P8	Cattell et al. (2008)	UK	FG, O, I	Residents; n=42	POS, PCS	Social relations (sense of community; tolerance; bonding)	Qualitative data analysis
P9	Francis et al. (2012)	Australia	S, FG	Residents	POS, PF, PCS	Sense of community (12 items, McMillan & Chavis SCI)	Linear regression
P10	Ganji & Rishbeth (2020)	UK	I, O	General population; n=30	POS, Str	Social integration/conviviality (symbolic diversity; visibility; playfulness)	Behavioural mapping
P11	Ghahramanpouri et al. (2015)	Malaysia	S	General pop.; n=227	Str	Social sustainability (equity, QoL, identity, inclusion)	Factor analysis

Continued on next page

Table F.1 continued from previous page

ID	Author(s), Year	Location	Methods	Sample	Typology	Outcomes Assessed	Analysis
P12	Hickman (2013)	UK	I	Residents; n=180	PCS, PF	Social interaction in third places; barriers	Qual. analysis
P13	Jones et al. (2015)	UK	O	General pop.; n=3	PCS	Everyday encounters in cafés	Qual. analysis
P14	Karsono et al. (2021)	Malaysia	Q, I, O	Gen. pop.; n=330 (Q), n=26 (I)	POS	Place attachment (engagement, familiarity)	Descriptive + qual. analysis
P15	Khalili & Fallah (2018)	Iran	O, I, SSI, FG	Female residents; n=28 FG, n=24 I	PCS, POS	Communal life (functional, social, visual, cultural)	Qual. analysis
P16	Khemri et al. (2020)	Algeria	O, I	Gen. pop.	POS, Str	Social activities (temporal/spatial distribution)	Qual. analysis
P17	Lara-Hernandez et al. (2019)	Mexico	O	Gen. pop.	Str	Temporary appropriation	Visual complexity analysis
P18	Liu et al. (2020)	China	S, O, I	Residents; n=1280	POS, PF, PCS	Social inclusion (diversity, neighbour interaction)	Logistic regression
P19	Bredewold et al. (2020)	Netherlands	O, I	Residents; n=78	POS, PF	Social inclusion (with/without disability)	Qual. analysis
P20	Lotfata & Ataöv (2020)	Turkey	I, O, S	Residents; n=18 FG, n=20 I	Str	Social sustainability (equity, identity, inclusion)	Fuzzy cognitive mapping
P21	Mahdinezhad et al. (2020)	Iran	I	Experts; n=11	PCS, POS	Socialisation in public space	Qual. + factor analysis
P22	Mantey (2015)	Poland	S	Residents; n=149	POS, PF, PCS	Place attachment (frequency, network, space)	Descriptive + qual. analysis
P23	Mateo-Babiano (2012)	Thailand	S	Gen. pop.; n=140	Str	Public life (pedestrian needs)	Descriptive analysis
P24	Mehta (2019)	US	S, O	Gen. pop.; n=66	Str	Social life (passive, fleeting, enduring)	Qual. analysis; behaviour mapping
P25	Mehta & Bosson (2021)	US	S, O	Gen. pop.; n=140	Str	Social interactions (liveliness index)	Behaviour mapping; regression; factor analysis
P26	Modie-Moroka et al. (2020)	S. Africa	O, I	Residents; n=110	POS	Social capital (networks, trust, efficacy)	Qual. + descriptive analysis

Continued on next page

Table F.1 continued from previous page

ID	Author(s), Year	Location	Methods	Sample	Typology	Outcomes Assessed	Analysis
P27	Nguyen (2019)	Singapore	O, SSI	Gen. pop.; n=18	POS	Social life (adaptability, mixing)	Behaviour mapping; qual. analysis
P28	Ortiz et al. (2004)	Spain	O, I	Female residents; n=8	POS	Sense of place (age, gender, culture)	Qual. analysis
P29	Piekut & Valentine (2017)	UK, Poland	S	Gen. pop.; n=1522 (Leeds), n=1499 (Warsaw)	PF, POS, PCS	Inter-ethnic contacts	Multilevel regression
P30	Priest et al. (2014)	Australia	O	Gen. pop.; n=974	PF, POS, PCS	Inter-group contact	Logistic + multinomial regression
P31	Purwanto & Harani (2020)	Indonesia	O	Gen. pop.; n=120	PF, POS, PCS, Str	Place attachment/identity	Qual. analysis
P32	Rivera et al. (2022)	Australia	S	Adolescents; n=468	POS, Str	Social connectedness (companionship, affiliation)	Multilevel regression
P33	Salimi et al. (2019)	Iran	I	Residents; n=16	POS	Social cohesion (conditional, interactional factors)	Grounded theory; site analysis
P34	Salvadó et al. (2020)	Chile	S, O	Residents; n=48	POS, Str	Belonging (elements, activities, users)	Qual. analysis; site analysis
P35	Sattarzadeh (2018)	Iran	Q, O, I	Residents; n=30	POS, Str	Place attachment (ambient, social, demographic)	Correlation analysis
P36	Aelbrecht (2016)	Portugal	O	Gen. pop.	FP	Informal social interactions (fourth places)	Spatial + behavioural analysis
P37	Aelbrecht et al. (2021)	Denmark, London	O	Gen. pop.; n=3	POS	Social cohesion (belonging, order, participation, recognition)	Urban design analysis
P38	Soares et al. (2020)	Netherlands	Q	Gen. pop.; n=318 (campus)	POS, PCS, PF	Creative encounters (affordances of creativity)	GIS analysis
P39	Nguyen et al. (2019)	Vietnam	SMD	Gen. pop.	POS, PCS, PF, Str, FP	Public urban life (activities, spaces, distribution)	Social media + GIS + correlation
P40	Trawalter et al. (2021)	US	S	Students; n=312	POS	Belonging (SES, iconic spaces)	Regression analysis
P41	Trillo (2017)	Italy	S, SSI	Residents; n=6 sites	POS, PF, Str	Social integration (mixed use, connectivity, activities)	Qual. + visual survey

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Table F.1 continued from previous page

ID	Author(s), Year	Location	Methods	Sample	Typology	Outcomes Assessed	Analysis
P42	Ujang et al. (2018)	Malaysia	SSI, O	Gen. pop.; n=16	POS, Str	Place attachment (integration, mixing)	Qual. analysis
P43	Watson (2008)	UK	O, I	Gen. pop.; n=6 sites	PCS	Social inclusion (connections, inclusive sociality, performance)	Qual. analysis
P44	Wickes et al. (2019)	Australia	S	Residents; n=4132	POS, PCS, PF, Str, FP	Social cohesion (networks, trust, attachment)	Multilevel regression; spatial analysis
P45	Williams & Hipp (2019)	US	S	Residents; n=2589	PCS	Social cohesion + neighbourhood interactions	Multilevel regression
P46	Zordan et al. (2019)	China	O	Gen. pop.; n=292	POS, PCS, PF, FP, Str	Face-to-face social interactions	GIS; correlation
P47	Zhu & Fu (2017)	China	S, O, I	Residents; n=1809	POS, PF, PCS, Str	Neighbourhood participation	Path analysis
P48	Zhang & Lawson (2009)	Australia	O	Residents; n=3 sites	POS, PCS	Social activity (distribution of activity types)	Qual. analysis; site analysis
P49	Peters & de Haan (2011)	Netherlands	O, SSI	Residents; n=40	POS, Str	Inter-ethnic interaction (multicultural everyday use)	Qual. analysis
P50	Dasgupta et al. (2022)	Japan	Q	Residents; n=2093	POS	Place attachment (identity, dependence, bonding)	Factor + regression
P51	Mullenbach et al. (2022)	US	S	Residents; n=521	POS	Trust (public space use, social support, income)	SEM
P52	Armstrong & Greene (2022)	US	S	Residents; n=489	POS	Sense of inclusion (interaction, belonging, authenticity)	EFA
P53	Powers et al. (2022)	US	Q	Residents; n=931	POS	Belonging + interracial contact	SEM
P54	leBrasseur (2022)	Finland	Q	Residents; n=1800	POS	Social wellbeing (ties, community, identity)	Relational analysis
P55	Samsudin et al. (2022)	Singapore	S	Residents; n=740	POS	Social capital (networks, trust, participation)	Correlation analysis
P56	Zahnow et al. (2022)	Australia	S	Residents; n=4088–4167	POS, PF, PCS, Str	Social cohesion + efficacy (ACCS study)	Panel models

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Table F.1 continued from previous page

ID	Author(s), Year	Location	Methods	Sample	Typology	Outcomes Assessed	Analysis
P57	Chen et al. (2022)	China	Q	Elderly; n=501 (65–95 yrs)	POS	Social cohesion (identity, wellbeing, dependence)	SEM
P58	Ahmed & Haykal (2022)	Iraq	Q, I	Gen. pop.; n=239	Str	Sense of place (appearance, amenities, comfort)	Spatial + descriptive analysis
P59	Shen et al. (2022)	China	S	Gen. pop.; n=102	POS	Social benefits (physical, perceptual, cognitive, activity)	SEM
P60	Vidal et al. (2022)	Portugal	O	Green space users; n=979	POS	Behaviour patterns (activity, demographics, mobility)	Descriptive + inferential analysis
P61	Wang & Liu (2022)	China	S	Residents; n=915	POS, PF, PCS	Inclusiveness (equal citizenship/entitlement)	SEM
P62	Gray & Manning (2022)	UK	FG	Young people; n=51	POS	Place identity (appropriation, autobiographical insideness)	Collaborative spatial mapping
P63	Loo & Fan (2023)	China	O	Gen. pop.	POS	Social interaction (spatial-temporal; edges; landmarks)	Binomial model

Note. Data collection methods code: O = observation; SSI = semi-structured interview; I = interview; SMD = social media data; S = survey; Q = questionnaire; FG = focus group. Public space typology code: POS = public open space; Str = street; PF = public facility; PCS = public commercial services; FP = fourth place.

Appendix G

Policy Documents Reviewed in the Structured Policy Review

Table G.1: Policy frameworks on public spaces across UK regions and core cities (most recent documents).

Region	**Core City**	**Policy Frameworks**
North East England	Newcastle upon Tyne	Design Guidance for Landmarks and Gateways in Newcastle's Urban Core (2021); Urban Design Framework for the Lower Ouseburn Valley SPD (2005); Designing for Community Safety SPD (2009); Green Infrastructure Delivery Framework (2018)
	Sunderland	City Plan (2023–2035); Public Space Protection Orders (2021)
North West England	Manchester	Our Manchester Strategy – Forward to 2025 (2015, ongoing); Public Realm Strategy (2022); Guide to Development in Manchester SPD (2007)
	Liverpool	Liverpool Local Plan 2013–2033 (2022); Liverpool Public Realm Strategy SPD (2023)
Yorkshire and the Humber	Leeds	Leeds Local Plan (2019); Leeds Public Realm Strategy (2015)
	Sheffield	The Sheffield Plan (2020); Sheffield City Centre Urban Design Compendium (2004)
East Midlands	Nottingham	Strategic Council Plan 2023–2027; Provision of Open Space in New Residential and Commercial Development SPD (2019)
	Leicester	Leicester City Core Strategy (2014); Leicester Public Realm Strategy (2005)
West Midlands	Birmingham	Birmingham Development Plan 2031; Birmingham Design Guide SPD (2022)
	Coventry	Coventry Local Plan (2011–2031); Urban Design Guidance (2004)
East of England	Cambridge	Cambridge Local Plan (2018); Design Codes for Strategic Development Sites within the Cambridge Fringe Areas (2012)
	Norwich	Norwich 2040 City Vision (2018); City Centre Public Spaces Plan (2024); Main Town Centre Uses and Retail Frontages SPD (2014)
South West England	Bristol	Bristol One City Plan (2023); Nelson Street Public Realm Strategy (2015); Core Strategy (2011)
	Plymouth	Plymouth Plan 2014–2034 (2021); Plymouth & South West Devon Joint Local Plan 2014–2034 (2020); Plymouth Waterfront Strategic Masterplan (2017); City Centre Strategic Masterplan (2017)
South East England	London	London Plan (2021); Islington Urban Design Guide SPD (2017); Southwark Plan 2019–2036 (2022); Southwark Streetscape Design Manual (2024)

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Table G.1 continued from previous page

Region	Core City	Policy Frameworks
	Southampton	Southampton City Centre Action Plan (2015); Connecting Southampton 2040; Southampton Urban Design Strategy (2001)
Wales	Cardiff	Cardiff Local Development Plan 2006–2026 (2016); Cardiff Residential Design Guide SPD (2008); Public Realm Manual – Creating Liveable Streets (2015); Liveable Design Guide (2015)
	Swansea	Swansea Local Development Plan 2010–2025 (2019); Residential Design Guide (2014); Infrastructure Delivery Plan (2022)
Scotland	Glasgow	City Development Plan (2016); Open Space Strategy (2020); City Centre Strategic Development Framework (2021); North Glasgow SDF (2023); River Clyde Development Corridor Framework (2020)
	Edinburgh	City Plan 2030 Proposed (2021); Edinburgh Local Development Plan (2016); Edinburgh Design Guidance (2016); Edinburgh Street Design Guidance (2015)
Northern Ireland	Belfast	Local Development Plan Strategy 2035 (2023); Placemaking and Urban Design SPG (2023); Evening & Night-time Economy SPG (2022); Advertising and Signage SPG (2023); Regional Development Strategy 2035; Strategic Planning Policy Statement (2015)
	Derry/Londonderry	Local Development Plan 2032; Draft Plan Strategy: Place-making and Design (2014, updated 2019); Creating Places: Achieving Quality in Residential Environments (2000)

Table G.2: Policy studies reviewed to identify the key UK policy frameworks on social cohesion.

ID	Author, Year	Policy Framework(s)	Geographic Scope	Policy Problem Space	Governance Level	Policy Focus
P1	Ratcliffe (2012)	Guidance on Community Cohesion (2002); Equality Act (2010)	UK	Community cohesion	National	Material inequality
P2	Anderson (2023)	Integrated Communities Strategies Green Paper (2018); Integrated Community Action Plan (2019)	UK, Bristol	Integration	National; local	Migration, community integration
P3	Bartram (2019)	Nationality, Immigration and Asylum Act (2002)	UK	Integration; social cohesion	National	Citizenship process
P4	Quinn (2008)	National Strategy for Neighbourhood Renewal	UK	Social capital	National; local	Voluntary sector, volunteering
P5	Knight et al. (2023)	Education Act (2004); SEND Code of Practice (0–25 years)	UK	Social inclusion; education	National	Inclusive education
P6	Morrison & Burgess (2014)	Town and Country Planning Act (1999)	UK	Social inclusion; housing	National; local	Inclusive housing
P7	Bridgen (2006)	UK health policies under Labour (1997–2005)	UK	Social capital; public health	National	Health inequality
P8	Giordano (2021)	EU Cohesion Policy (1970–2020); Levelling Up (2020)	EU, UK	Social cohesion; spatial economic development	–	Spatial/social disparity
P9	Pemberton (2008)	Social Exclusion Action Plan (2006); Opportunity for All (1999)	UK, Liverpool	Social inclusion	National; local	Poverty, exclusion
P10	Phillimore (2012)	Borders, Citizenship and Immigration Act (2009)	UK	Integration	National	Immigration integration
P11	Norwich (2005)	Green Paper: Excellence for All Children	UK	Social inclusion	National	Inclusive education
P12	Grimshaw et al. (2018)	National Living Wage (2016)	UK	Social inclusion; employment	National	Employment, inequality

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Table G.2 continued from previous page

ID	Author, Year	Policy Framework(s)	Geographic Scope	Policy Problem Space	Governance Level	Policy Focus
P13	Blake et al. (2008)	Local Government White Paper (2006); Local Government and Public Involvement in Health Act (2007)	UK	Community cohesion; integration; social capital	National; local	Place-shaping, engagement
P14	Cheong et al. (2007)	Asylum and Immigration Act (2004); Building Cohesive Communities (2001)	UK	Social capital; social cohesion	National	Immigration
P15	Roche (2004)	National Strategy for Neighbourhood Renewal; Action Plan	UK, West Midlands	Social capital	National; regional	Community-led development
P16	Fitzpatrick & Jones (2005)	Homelessness Act (2002)	UK	Social cohesion	National	Housing, homelessness
P17	Robinson (2005)	Community Cohesion: An Action Guide (2004)	UK	Community cohesion	National; local	Housing, integration
P18	Bouttel (2023)	Integrated Communities Strategy Green Paper (2018)	UK	Integration	National	Migration
P19	Tweed et al. (2022)	Marmot Review (2010)	UK	Social inclusion	National	Inclusion health
P20	Nnamani & Lomer (2024)	SEN Green Paper (1997); Opportunity for All (2002); Children and Families Act (2014)	UK, England	Social inclusion	National	Inclusive education
P21	Mattei & Broeks (2018)	Prevent Duty Guidance (2015); Crick Report (1998); Education Act (2002)	UK, Netherlands	Integration	National	Citizenship education

Appendix H

Sample Sizes per Spatial-Temporal Segment across Day Types

Table H.1: Total observations by day type and spatial category.

	Location	Day Type	Total Observations
1	0.5km	Weekday	3,796
2	0.5km	Weekend	361
3	1km	Weekday	787
4	1km	Weekend	524
5	2km	Weekday	3,431
6	2km	Weekend	1,010
7	Botanical Gardens	Weekday	1,337
8	Botanical Gardens	Weekend	489
9	City Centre	Weekday	3,796
10	City Centre	Weekend	361
11	Division Street	Weekday	2,373
12	Division Street	Weekend	361
13	Ecclesall Road	Weekday	2,133
14	Ecclesall Road	Weekend	680
15	Peace Gardens	Weekday	787
16	Public Open Space	Weekday	3,547
17	Public Open Space	Weekend	1,013
18	Residential Neighbourhoods	Weekday	4,218
19	Residential Neighbourhoods	Weekend	1,534
20	Sheffield	Weekday	8,014
21	Sheffield	Weekend	1,895
22	Street	Weekday	4,467
23	Street	Weekend	882
24	Western Bank Park	Weekday	787
25	Western Bank Park	Weekend	524

Appendix I

Correlation Matrix by Outcome variables and Urban Contexts

Table I.1: Correlation Matrix (Residential Neighbourhood) of Spatial-Perceptual Variables and Social Interaction Variables

	Q13	Q14	Q15	Q16	Q17	Q18	Q19	Q20	Q21	Q22	Q23	Q24
Q13	1	0.40**	0.43**	0.42**	0.19**	0.12**	0.10**	0.15**	0.07**	0.07**	0.04**	0.12**
Q14		1	0.43**	0.42**	0.45**	0.20**	0.13**	0.27**	0.08**	0.10**	0.09**	0.14**
Q15			1	0.67**	0.29**	0.08**	0.07**	0.14**	-0.00**	0.01**	0.09**	0.10**
Q16				1	0.35**	0.15**	0.11**	0.24**	-0.00**	0.02**	0.06**	0.07**
Q17					1	0.21**	0.16**	0.22**	0.04**	0.06**	0.10**	0.08**
Q18						1	0.53**	0.55**	0.07**	0.04**	0.16**	0.11**
Q19							1	0.54**	0.07**	0.02**	0.14**	0.18**
Q20								1	0.07**	0.06**	0.13**	0.13**
Q21									1	0.57**	0.24**	0.38**
Q22										1	0.30**	0.35**
Q23											1	0.49**
Q24												1

Note: Coefficients marked with ** indicate statistical significance at both 0.1% and 1% level. The matrix is symmetric, and only the upper triangle is displayed for clarity.

Table I.2: Correlation Matrix (City Centre) of Spatial-Perceptual Variables and Social Interaction Variables

	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q21	Q22	Q23	Q24
Q5	1	0.33**	0.32**	0.28**	0.12**	0.03**	0.02**	0.08**	0.07**	0.12**	0.03**	0.09**
Q6		1	0.33**	0.35**	0.34**	0.04**	0.07**	0.12**	0.10**	0.17**	0.11**	0.18**
Q7			1	0.43**	0.29**	0.00**	-0.01**	0.08**	0.14**	0.18**	0.12**	0.14**
Q8				1	0.35**	0.11**	0.07**	0.17**	0.04**	0.09**	0.08**	0.11**
Q9					1	0.10**	0.07**	0.11**	0.05**	0.05**	0.06**	-0.01**
Q10						1	0.48**	0.52**	0.01**	-0.08**	0.06**	0.04**
Q11							1	0.57**	-0.05**	-0.08**	0.07**	0.10**
Q12								1	0.03**	-0.00**	0.09**	0.07**
Q21									1	0.57**	0.24**	0.38**
Q22										1	0.30**	0.35**
Q23											1	0.49**
Q24												1

Note: Coefficients marked with ** indicate statistical significance at both 0.1% and 1% level. The matrix is symmetric, and only the upper triangle is displayed for clarity.

Bibliography

Abed, A., & Al-Jokhadar, A. (2021). Common space as a tool for social sustainability. *Journal of Housing and the Built Environment*, 1–17.

Adams, J., & Robinson, P. (2002). *Devolution in practice: Public policy differences within the uk*. Institute for public policy research.

Aelbrecht, P. (2016). 'fourth places': The contemporary public settings for informal social interaction among strangers. *Journal of Urban Design*, 124–152.

Aelbrecht, P., & Stevens, Q. (2019). Emerging knowledge at the intersection of public space design and social cohesion. In P. Aelbrecht & Q. Stevens (Eds.), *Public space design and social cohesion: An international comparison* (pp. 318–325). Taylor & Francis.

Aelbrecht, P., Stevens, Q., & Kumar, S. (2021). European public space projects with social cohesion in mind: Symbolic, programmatic and minimalist approaches. *European Planning Studies*, 1–31.

Aelbrecht, P., Stevens, Q., & Nisha, B. (2019). From mixing with strangers to collective placemaking : Existing theories, policies and practices around social cohesion in public space design. In *Public space design and social cohesion: An international comparison* (pp. 1–33).

Aelbrecht, P., & Stevens, Q. (2023). Geographies of encounter, public space, and social cohesion: Reviewing knowledge at the intersection of social sciences and built environment disciplines. *Urban Planning*, *8*(4), 63–76.

Ager, A., & Strang, A. (2008). Understanding integration: A conceptual framework. *Journal of Refugee Studies*, 166–191.

Akbar, P. N., & Edelenbos, J. (2021). Positioning place-making as a social process: A systematic literature review. *Cogent Social Sciences*, 1–30.

Akesson, B., Burns, V., & Hordyk, S.-R. (2017). The place of place in social work: Rethinking the person-in-environment model in social work education and practice. *Journal of Social Work Education*, *53*(3), 372–383.

Alcaraz, K. I., Wiedt, T. L., Daniels, E. C., Yabroff, K. R., Guerra, C. E., & Wender, R. C. (2020). Understanding and addressing social determinants to advance

cancer health equity in the united states: A blueprint for practice, research, and policy. *CA: A Cancer Journal for Clinicians*, 31–46.

Alidoust, S., Gleeson, N., & Khalaj, F. (2022). A systematic review of planning policies for community wellbeing. *Journal of Urbanism*, 1–19.

Alipour, S. M., & Ahmed, K. (2021). Assessing the effect of urban form on social sustainability: A proposed 'integrated measuring tools method' for urban neighborhoods in dubai. *City, Territory and Architecture*, 1–21.

Ameen, R. F., Mourshed, M., & Li, H. (2015). A critical review of environmental assessment tools for sustainable. *Environmental Impact Assessment Review*, 110–125.

Amin, A. (2002). Ethnicity and the multicultural city: Living with diversity. In *Environment and planning a: Economy and space* (pp. 959–980).

Amin, A. (2006a). The good city. *Urban Studies*, 1009–1023.

Amin, A. (2006b). The good city. *Urban Studies*, 1009–1023.

Amin, A. (2008). Collective culture and urban public space. *City*, 5–24.

Amin, A. (2010). *Cities and the ethic of care for the stranger*. Joseph Rowntree Foundation.

Amran, M. F., & Fuad, A. H. (2020). The effect of public spaces' physical features on interaction between strangers. *Case study*, 1–7.

Anderson, B. (2023). Integration: A tale of two communities. *Mobilities*, 606–619.

Angeles, R. N., Dolovich, L., Kaczorowski, J., & Thabane, L. (2014). Developing a theoretical framework for complex community-based interventions. *Health Promotion Practice*, *15*(1), 100–108.

Arnold, T., & Hickson, J. (2022). Levelling up. *Post-Industrial City-Regions in England. Transactions of the Association of European Schools of Planning*, 1–13.

Askari, A. H., Soltani, S., & Ahmad, I. M. (2015). Engagement in public open spaces across age groups: The case of merdeka square in kuala lumpur city, malaysia. *Urban Design International*, 93–106.

Askarizad, R., & Safari, H. (2020). The influence of social interactions on the behavioral patterns of the people in urban spaces (case study: The pedestrian zone of rasht municipality square, iran). *Cities*, 1–16.

Askarizad, R., Lamíquiz Daudén, P. J., & Garau, C. (2024). The application of space syntax to enhance sociability in public urban spaces: A systematic review. *ISPRS International Journal of Geo-Information*, *13*(7), 227.

Atkinson, A. B., Marlier, E., & Nolan, B. (2004). Indicators and targets for social inclusion in the european union. *Journal of Common Market Studies*, 47–75.

Bachtler, J., & Begg, I. (2017). Cohesion policy after brexit: The economic, social and institutional challenges. *Journla of Social Policy*, 745–763.

Bada, Y. (2012). *The impact of visibility on visual perception and space use: The case of urban plazas in biskra . doctorate thesis, lahe research laboratory, university of biskr*. http://thesis.univ-biskra.dz/2087/1/Th%C3%A8se_2012.pdf

Badach, J., & Dymnicka, M. (2017). Concept of 'good urban governance' and its application in sustainable urban planning. iop conf. In *Series: Materials science and engineering* (pp. 1–9).

Bailey, N. (2010). Understanding community empowerment in urban regeneration and planning in england: Putting policy and practice in context. *Planning Practice & Research*, 317–332.

Baker, L. (2006). Observation: A complex reserach method. *Library Trends*, 171–189.

Barbarossa, L. (2020). The post pandemic city: Challenges and opportunities for a non-motorized urban environment. an overview of italian cases. *Sustainability*, 1–19.

Baron, R. M., & Kenny, D. A. (1986). The moderator–mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of personality and social psychology*, *51*(6), 1173.

Barr, S., Lampkin, S., Dawkins, L., & Williamson, D. (2021). Shared space: Negotiating sites of (un)sustainable mobility. *Geoforum*, 283–292.

Bartram, D. (2019). The uk citizenship process: Political integration or marginalization? *Sociology*, 671–688.

Bateman, L. B., Fouad, M. N., Sullivan, A., Heider, L., & Oates, G. R. (2021). Barriers and facilitators to bikeshare programs: A qualitative study in an urban environment. *Journal of Transport and Health*, *21*(March 2020), 101062. https://doi.org/10.1016/j.jth.2021.101062

Beck, H. (2009). Linking the quality of public spaces to quality of life. *Journal of Place Management and Development*, 240–248.

Bell, S., Montarzino, A., & Travlou, P. (2007). Mapping research priorities for green and public urban space in the uk. *Urban Forestry & Urban Greening*, 103–115.

Benton, D. C., González-Jurado, M. A., & Beneit-Montesinos, J. V. (2013). A structured policy review of the principles of professional self-regulation. *International Nursing Review*, 13–22.

Berger, P., & Luckmann, T. (2016). The social construction of reality. In *Social theory re-wired* (pp. 110–122). Routledge.

Berger, R. (2015). Now i see it, now i don't: Researcher's position and reflexivity in qualitative research. *Qualitative Research*, *15*(2), 219–234. https://doi.org/10.1177/1468794112468475

Bernard, P. (1999). *Social cohesion: A critique*. Canadian Policy Research Networks.

Bertolini, L. (2020). From "streets for traffic" to "streets for people": Can street experiments transform urban mobility? *Transport Reviews*, 734–753.

Biddulph, M. (2023). Post-occupancy evaluation. In H. Kamalipou, A. Patricia, & N. Peimani (Eds.), *The routledge handbook of urban design research methods* (pp. 439–450). Routledge.

Biggs, R., De Vos, A., Preiser, R., Clements, H., Maciejewski, K., & Schlüter, M. (2021). *The routledge handbook of research methods for social-ecological systems*. Taylor & Francis.

Bjornstrom, E. E., & Ralston, M. L. (2014). Neighborhood built environment, perceived danger, and perceived social cohesion. *Environment and Behavior*, 718–744.

Blake, G., Diamond, J., Foot, J., Gidley, B., & Mayo, M. (2008). *Community engagement and community cohesion*. Joseph Rowntree Foundation.

Blumer, H. (1986). *Symbolic interactionism: Perspective and method*. Univ of California Press.

BMJ. (2021). The prisma 2020 statement: An updated guideline for reporting systematic reviews. *Research Methods & Reporting*, 1–9.

Boarin, P., Besen, P., & Haarhoff, E. (2018). Post-occupancy evaluation of neighbourhoods: A review of the literature. *Building research & information*, *29*(2), 168–174.

Boessen, A., Hipp, J., Butts, C., Nagle, N., & Smith, E. (2018). The built environment, spatial scale, and social networks: Do land uses matter for personal network structure? In *Environment and planning b: Urban analytics and city science* (pp. 400–416).

Bonakdar, A., & Audirac, I. (2020). City branding and the link to urban planning: Theories, practices, and challenges. *Journal of Planning Literature*, 147–160.

Bonnes, M., & Secchiaroli, G. (1995). Environmental psychology: A psycho-social introduction.

Boyko, C., Cooper, R., & Davey, C. (2005). Sustainability and the urban design process. *Proceedings of the Institution of Civil Engineers - Engineering Sustainability*, 119–125.

Bozkurt, M. (2016). Digital age for observations: The use of gis for analysing observations and behaviour mapping. *J Digital Landsc Archit*, *10*, 537612003.

Bragalia, F., & Caruso, N. (2020). Temporary uses: A new form of inclusive urban regeneration or a tool for neoliberal policy? *Urban Research & Practice*, 194–214.

Brain, D. (2019). Reconstituting the urban commons: Public space, social capital and the project of urbanism. *Urban Planning*, *4*(2), 169–182.

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative research in psychology*, *3*(2), 77–101.

Bredewold, F., Haarsma, A., Tonkens, E., & Jager, M. (2020). Convivial encounters: Conditions for the urban social inclusion of people with intellectual and psychiatric disabilities. *Urban Studies*, 2047–2063.

Bronfenbrenner, U. (1980). Ecology of childhood. *School Psychology Review*, *9*(4), 294–297.

Brown, K. M. (2012). Sharing public space across difference: Attunement and the contested burdens of choreographing encounter. *Social & Cultural Geography*, *13*(7), 801–820.

Brown, S. C., & Lombard, J. L. (2014). Neighborhoods and social interaction. In R. Cooper, E. Burton, & C. L. Cooper (Eds.), *Wellbeing and the environment: Wellbeing: A complete reference guide* (pp. 1–29). John Wiley & Sons.

Brunelli, L., Smith, H., & Woolrych, R. (2022). A salutogenic urban design framework: The case of uk local high streets and older people. *Health Promotion International*, 1–17.

Calafati, L., Froud, J., Haslam, C., Johal, S., & Williams, K. (2022). The crisis of everyday liveability, policy and politics. *The Political Quarterly*, 640–648.

Can, I., & Heath, T. (2015). The changing nature of the neighbourhood and neighbourless: Urban spaces of interactions and sense of community, a case study of izmir, turkey. *Journal of Architectural and Planning Research*, 1–23.

Can, I., & Heath, T. (2016). In-between spaces and social interaction: A morphological analysis of izmir using space syntax. *Journal of Housing and the Built Environment*, 31–49.

Cao, J., & Kang, J. (2019). Social relationships and patterns of use in urban public spaces in China and the united kingdom. *Cities*, 188–196.

Capacci et al. (2012). Policies to promote healthy eating in europe: A structured review of policies and their effectiveness. *Nutrition Reviews*, 188–200.

Caprotti, F. (2019). Spaces of visibility in the smart city: Flagship urban spaces and the smart urban imaginary. *Urban Studies*, 2465–2479.

Carmona, M. (2003). *Public places urban spaces the dimensions of urban design*. Routledge.

Carmona, M. (2010a). Contemporary public space, part two: Classification. *Journal of Urban Design*, 157–173.

Carmona, M. (2010b). Contemporary public space: Critique and classification, part one: Critique. *Journal of Urban Design*, 123–148.

Carmona, M. (2014). Re-theorising contemporary public space: A new narrative and a new normative. *Journal of Urbanism: International Research on Placemaking and Urban Sustainability*, 373–405.

Carmona, M. (2015). Re-theorising contemporary public space: A new narrative and a new normative. *Journal of Urbanism*, 1–34.

Carmona, M. (2017). The formal and informal tools of design governance. *Journal of Urban Design*, 1–36.

Carmona, M. (2019a). Place value: Place quality and its impact on health, social, economic and environmental outcomes. *Journal of Urban Design*, 1–48.

Carmona, M. (2019b). Principles for public space design, planning to do better. *URBAN DESIGN International*, 47–59.

Carmona, M., & De Magalhaes, C. (2006). Public space management: Present and potential. *Journal of Environmental Planning and Management*, 75–99.

Carmona, M., & Sieh, L. (2008). Performance measurement in planning - towards a holistic view. In *Environment and planning c: Government and policy* (pp. 428–454).

Carr, S. (1992). *Public space*. Cambridge University Press.

Cattell, V., Dines, N., Gesler, W., & Curtis, S. (2008a). Mingling, observing, and lingering: Everyday public spaces and. *Health & Place*, 544–561.

Cattell, V., Dines, N., Gesler, W., & Curtis, S. (2008b). Mingling, observing, and lingering: Everyday public spaces and their implications for well-being and social relations. *Health and Place*, 544–561.

Chan, J., To, H. P., & Chan, E. (2006). Reconsidering social cohesion: Developing a definition and analytical framework for empirical research. *Social Indicators Research*, 273–302.

Chapman, D. W., & Larkham, P. J. (1999). Urban design, urban quality and the quality of life. *Journal of Urban Design*, 211–232.

Chen, S., Sun, Y., & Seo, B. (2022). The effects of public open space on older people's well-being: From neighborhood social cohesion to place dependence. *International Journal of Environmental Research and Public Health*, 1–16.

Cheong, H. P., Edwards, R., Goulbourne, H., & Solomos, J. (2007). Immigration, social cohesion and social capital: A critical review. *Critical Social Policy*, 24–49.

Cheshmehzangi, A. (2015). The reinvention of liveability in public places: Interaction mapping analysis of central nottingham's improved walkability. *Journal of Human Behavior in the Social Environment*, 426–440.

Cheshmehzangi, A., & Heat, T. (2012). Urban identities: Influences on socio-environmental values and spatial inter-relations. *Procedia-Social and Behavioral Sciences*, *36*, 253–264.

Claridge, T. (2018). Functions of social capital – bonding, bridging, linking. *Social Capital Research*, 1–7.

Cleave, E., & Arku, G. (2020). Planning for local economic development: Research into policymaking and practice. *Urban Planning*, 319–322.

CLES. (2011). *Cles rapid research: No. 2 neighbourhood renewal fund allocation 2006/08*. Centre for Local Economic Strategies.

Cohen, J. (2013). *Statistical power analysis for the behavioral sciences*. routledge.

Coleman, L. (2009). Being alone together: From solidarity to solitude in urban anthropology. *Anthropological Quarterly*, *82*(3), 755–777.

Commission, E. (2022, March 11). *New eu cohesion policy (2021-2027)* [Retrieved from European Commission]. Retrieved March 11, 2022, from https://ec.europa.eu/regional_policy/en/information/videos/new-eu-cohesion-policy-2021-2027

Cortina, J. M. (1993). Interaction, nonlinearity, and multicollinearity: Implications for multiple regression. *Journal of management*, *19*(4), 915–922.

Council, B. (2024, September 29). Retrieved September 29, 2024, from https://england.britishcouncil.org/skills-leadership/active-citizens

Cowden, S., & Singh, G. (2017). Community cohesion, communitarianism and neoliberalism. *Critical Social Policy*, 268–286.

Cozens, P., & Love, T. (2017). The dark side of crime prevention through environmental design (cpted). In *Oxford research encyclopedia of criminology and criminal justice*.

Creswell, J. W., & Clark, V. L. P. (2017). *Designing and conducting mixed methods research*. Sage publications.

Dallago, L., Perkins, D. D., Santinello, M., Boyce, W., Molcho, M., & Morgan, A. (2009). Adolescent place attachment, social capital, and perceived safety: A comparison of 13 countries. *American Joural of Community Psychology*, 148–160.

Dash, S. P., & Thilagam, N. L. (2022). A study on inter- relationship of open space and social cohesion for wellbeing of elderly: A systematic literature review. *International Journal of Built Environment and Sustainability*, 55–72.

Davidson, M. (2010). Social sustainability and the city. *Geography Compass*, 872–880.

Davies, A.-M., Laing, R., et al. (2002). Designing choice experiments using focus groups: Results from an aberdeen case study. *Forum Qualitative Sozialforschung/Forum: Qualitative Social Research*, *3*(3).

DCLG. (2015). *New deal for communities national evaluation phase 2*. Department for Communities; Local Government.

De Magalhães, C., & Carmona, M. (2009). Dimensions and models of contemporary public space management in england. *Journal of Environmental Planning and Management*, 111–129.

De Vos, A., Biggs, R., & Preiser, R. (2019). Methods for understanding social-ecological systems: A review of place-based studies. *Ecology and Society*, *24*(4), 16.

Del Aguila, M., Ghavampour, E., & Vale, B. (2019). Theory of place in public space. *Urban Planning*, 1–15.

Dempsey, N. (2008). Does quality of the built environment affect social cohesion? *Proceedings of the Institution of Civil Engineers - Urban Design and Planning*, 105–114.

Dempsey, N. (2009). Are good-quality environments socially cohesive? measuring quality and cohesion in urban neighbourhoods. *Town Planning Review*, 315–345.

Dempsey, N., Bramley, G., Power, S., & Brown, C. (2011). The social dimension of sustainable development: Defining urban social sustainability. *Sustainable Development*, 289–300.

Dempsey, N., & Burton, M. (2012). Defining place-keeping: The long-term management of public spaces. *Urban Forestry & Urban Greening*, 11–20.

Dewey, J. (2018). *Logic-the theory of inquiry*. Read Books Ltd.

Dickes, P., & Valentova, M. (2012). Construction, validation and application of the measurement of social cohesion in 47 european countries and regions. *Social Indicators Research*, 827–846.

Dines, N., Cattell, V., Gesler, W., & Curtis, S. (2006a). Public spaces, social relations and well-being in east london. *Joseph Rowntree Foundation*, 1–43.

Dines, N., Cattell, V., Gesler, W., & Curtis, S. (2006b). Public spaces, social relations and well-being in east london. *Published for the Joseph Rowntree Foundation by The Policy Press*, 1–56.

du Toit, J. L., & Mouton, J. (2013). A typology of designs for social research in the built environment. *International Journal of Social Research Methodology*, 125–139.

Dunn, W. (2012). Problem structuring in policy analysis. *American Behavioral Scientist*, 1–33.

Durkheim, E. (1893). *De la division du travail social: Etude sur l'organisation de societes superieures*. Felix Alcan.

Eckersley, P., & Tobin, P. (2019). The impact of austerity on policy capacity in local government. *Policy & Politics*, *47*(3), 455–472.

Elfartas, H. O., Albeera, H. A., & Jibril, J. D. (2022). Inter-ethnic interactions in urban public space: The malaysian experience. *Journal of Pure & Applied Sciences*, *21*(4), 240–245.

Elvy, J. K. (2019). *Towards socially inclusive sustainable mobility: The role of social capital in participatory transport planning processes* [Doctoral dissertation, University of Leeds].

England, H. (2024, September 29). *What we do* [Retrieved from Healthwacth England]. Retrieved September 29, 2024, from https://www.healthwatch.co.uk/what-we-do

Enssle, F., & Kabisch, N. (2020). Urban green spaces for the social interaction, health and well-being of older people—an integrated view of urban ecosystem services and socio-environmental justice. *Environmental science & policy*, *109*, 36–44.

Eshuis, J., & Klijn, E. (2017). City branding as a governance strategy. In J. Hannigan & G. Richards (Eds.), *The sage handbook of new urban studies* (pp. 92–105). Sage.

Evans, G. (2014). Accessibility and user needs. *pedestrain mobility and urban deign in the UK. Municipal Engineer*, 32–44.

Ewing, R., & Handy, S. (2009). Measuring the unmeasurable: Urban design qualities related to walkability. *Journal of Urban design*, *14*(1), 65–84.

Fageir, M., Porter, N., & Borsi, K. (2020). Contested grounds; the regeneration of liverpool waterfront. *Planning Perspectives*, 535–557.

Ferragina, E., & Arrigoni, A. (2017). The rise and fall of social capital: Requiem for a theory? *Political Studies Review*, 355–367.

Finney, N., Clark, K., & Nazroo, J. (2019). Opportunities and challenges doing interdisciplinary research: What can we learn from studies of ethnicity, inequality and place? *Journal of Ethnic and Migration Studies*, *45*(17), 3173–3187.

Fisher, R. (2002). Social cohesion in the united kingdom: A case report. *Canadian Journal of Communication*, 161–166.

Flint, J., & Kearns, A. (2007). Housing, neighbourhood renewal and social capital: The case of registered social landlords in scotland. *European Journal of Housing Policy*, 31–54.

Flyvbjerg, B. (2001). *Making social science matter: Why social inquiry fails and how it can succeed again*. Cambridge university press.

Forrest, R., & Kearns, A. (2001). Social cohesion, social capital and the neighbourhood. *Urban Studies*, 2125–2143.

Francis, J., Giles-Corti, B., Wood, L., & Knuiman, M. (2012). Creating sense of community: The role of public space. *Journal of Environmental Psychology*, 401–409.

Frech, A., & Kimbro, R. T. (2011). Maternal mental health, neighborhood characteristics, and time investments in children. *Journal of Marriage and Family*, 605–620.

Friedmann, R., & Lessig, V. P. (1987). Psychological meaning of products and product positioning. *Journal of Product Innovation Management*, *4*(4), 265–273.

Frumkin, H., Frank, L., & Jackson, R. (2004). *Urban sprawl and public health: Designing, planning, and building for healthy communities.*

Funder, D. C., & Ozer, D. J. (2019). Evaluating effect size in psychological research: Sense and nonsense. *Advances in methods and practices in psychological science*, *2*(2), 156–168.

Gaffikin, F., Mceldowney, M., & Sterrett, K. (2010). Creating shared public space in the contested city: The role of urban design. *Journal of Urban Design*, 493–513.

Gallent, N., & Wong, C. (2009). Place shaping, spatial planning and liveability. *Town Planning Review*, 353–358.

Ganji, F., & Rishbeth, C. (2020). Conviviality by design: The socio-spatial qualities of spaces of intercultural urban encounters. *Urban Design International*, 215–234.

Gannon, B., & Roberts, J. (2020). Social capital: Exploring the theory and empirical divide. *Empirical Economics*, 899–919.

Gans, H. J. (2002). The sociology of space: A use-centered view. *City & Community*, 329–339.

García-Palomares, J. C., Gutiérrez, J., & Cardozo, O. D. (2013). Walking accessibility to public transport: An analysis based on microdata and gis. *Environment and Planning B: Planning and Design*, *40*(6), 1087–1102.

Gastelum-Vargas, M. (2025). Trajectories of being: How affordances shape identity and behavior across time. *Topoi*, 1–13.

Gaventa, J. (2004). *Representation, community leadership and participation: Citizen involvement in neighbourhood renewal and local governance*. Neighbourhood Renewal Unit/Office of Deputy Prime Minister.

Gehl, J. (2011). *Life between buildings: Using public space*. Island Press.

Gehl, J. (2007). Three types of outdoor activities; Outdoor activities and quality of outdoor space. *Urban Design Reader*, 4.

Gewirtz, S., Dickson, M., Power, S., Halpin, D., & Whitty, G. (2005). The deployment of social capital theory in educational policy and provision: The case of education action zones in england. *British Educational Research Journal*, 651–673.

Ghahramanpouri, A., Abdullah, A. S., Sedaghatnia, S., & Lamit, H. (2015). Urban social sustainability contributing factors in kuala lumpur streets. *Procedia - Social and Behavioral Sciences*, 368–376.

Ghahremani, H., Bajestani, S. A., McCarthy, L., & Jalalianhosseini, M. (2021). Transformation of urban spaces within cities in the context of globalization

and urban competitiveness. *Journal of Urban Planning and Development*, 1–17.

Ghel, J. (1973). *Life between buildings: Using public spaces*. Island Press.

Gibert-Flutre, M. (2022). Rhythmanalysis: Rethinking the politics of everyday negotiations in ordinary public spaces. *Environment and Planning C: Politics and Space*, *40*(1), 279–297.

Gibson, J. (1977). J.(1977). the theory of affordances. *Perceiving, acting, and knowing: Toward an ecological psychology*, 67–82.

Gifford, R. (2007). Environmental psychology: Principles and practice.

Gifford, R. (2014). Environmental psychology matters. *Annual review of psychology*, *65*(1), 541–579.

Gil, J., & Duarte, J. P. (2013). Tools for evaluating the sustainability of urban design: A review. *Urban Design and Planning*, 311–325.

Goodchild, B., & Cole, I. (2001). Social balance and mixed neighbourhoods in britain since 1979: A review of discourse and practice in social housing. *Environment and Planning D: Society and Space*, *19*(1), 103–121.

Gooren, J. (2023). The logic of cpted for public space or the social potential of physical security. *Crime, law and social change*, *79*(4), 417–436.

Gov., U. (2024, September 29). *Big society speech* [Retrieved from GOV.UK]. Retrieved September 29, 2024, from https://www.gov.uk/government/speeches/big-society-speech

Granovetter, M. S. (1973). The strength of weak ties. *American journal of sociology*, *78*(6), 1360–1380.

Gray, D., & Manning, R. (2022). Constructing the places of young people in public space: Conflict, belonging and identity. *British Journal of Social Psychology*, *61*(4), 1400–1417.

Gray, N., & Broadhurst, K. (2023). Post-brexit regional policy in england: Exploring 'levelling up' in practice. *Regional Studies*, 2551–2562.

Grimshaw, D., Rafferty, A., & Whittaker, M. (2018). Inequality and inclusive growth: The case of the united kingdom. In B. Nolan (Ed.), *Inequality and inclusive growth in rich countries: Shared challenges and contrasting fortunes* (pp. 296–332). Oxford University Press.

Guo, X., Yang, Y., Cheng, Z., Wu, Q., Li, C., Lo, T., & Chen, F. (2022). Spatial social interaction: An explanatory framework of urban space vitality and its preliminary verification. *Cities*, 1–15.

Guo, Y., Liu, Y., Lu, S., Chan, O., Chui, C., & Lum, T. (2021). Objective and perceived built environment, sense of community, and mental wellbeing in older adults in hong kong: A multilevel structural equation study. *Landscape and Urban Planning*, 1–12.

Gupta, S. (2017). Ethical issues in designing internet-based research: Recommendations for good practice. *Journal of Research Practice*, *13*(2), D1.

Hair, J. F. (2014). *A primer on partial least squares structural equation modeling (pls-sem)*. sage.

Hajer, M., & Reijndorp, A. (2001). *In search of new public domain*. NAi Publishers.

Haman, O. B., Hulse, K., & Jacobs, K. (2021). Social inclusion and the role of housing. In P. Liamputtong (Ed.), *Handbook of social inclusion* (pp. 1–20). Springer.

Hankinson, G. (2001). Location branding: A study of the branding practices of 12 english cities. *journal of brand management*, *9*(2), 127–142.

Hannson, J., & Hillier, B. (1987). *The architecture of community: Some new proposals on the social consequences of architectural and planning decisions. architecture and behaviour, 251–273*.

Harris, M., & Young, P. (2009). Developing community and social cohesion through grassroots bridge-building: An exploration. *Policy & Politics*, 517–534.

Harris, N., & Thomas, H. (2004). Planning for a diverse society?: A review of the uk government's planning policy guidance. *Town Planning Review*, 473–500.

Harvey, D. (2006). The political economy of public space. In S. M. Low & N. Smith (Eds.), *The politics of public space* (pp. 17–34). Routledge.

Head, B. W. (2019). Forty years of wicked problems literature: Forging closer links to policy studies. *Policy and Society*, 180–197.

Heffernan, E., Heffernan, T., & Pan, W. (2014). The relationship between the quality of active frontages and public perceptions of public spaces. *Urban Design International*, *19*(1), 92–102.

Hickman, M. J., & Mai, N. (2015). Migration and social cohesion: Appraisingthe resilience of place in london. *Population, Space and Place*, 421–432.

Hickman, P. (2013). "third places" and social interaction in deprived neighbourhoods in great britain. *Journal of Housing and the Built Environment*, 221–236.

Hill, M. (2009). *The public policy process*. Pearson Longman.

Hillier, B. (2002). A theory of the city as object: Or, how spatial laws mediate the social construction of urban space. *Urban Design International*, 153–179.

Holman, N. (2013). What can social capital tell us about planning under localism? *Local Government Studies*, 71–88.

Home Office. (2024, September). Indicators of integration framework 2019 [Accessed: 2025-09-14].

Howlett, M., Ramesh, M., & Perl, A. (2009). *Studying public policy: Policy cycles & policy subsystems*. Oxford University Press.

Hsia, C.-J. (1988). An epistemological critique of environment-behaviour studies. *Arch. & Comport./Arch. Behav*, *4*, 295–313.

Hulse, K., & Stone, W. (2007). Social cohesion, social capital and social exclusion: A cross cultural comparison. *Policy Studies*, 109–128.

Innes, J. E., & Booher, D. E. (2004). Reframing public participation: Strategies for the 21st century. *Planning theory & practice*, *5*(4), 419–436.

Irvine, K. N., Warber, S. L., Devine-Wright, P., & Gaston, K. J. (2013). Understanding urban green space as a health resource: A qualitative comparison of visit motivation and derived effects among park users in sheffield, uk. *International journal of environmental research and public health*, *10*(1), 417–442.

Ivankova, N. V., Creswell, J. W., & Stick, S. L. (2006). Using mixed-methods sequential explanatory design: From theory to practice. *Field methods*, *18*(1), 3–20.

Iveson, K. (2007). Putting the public back into public space. *Urban Policy and Research*, 21–33.

Jacobs, J. (1961). *The death and life of great American cities*. Random House.

James, L. R., & Brett, J. M. (1984). Mediators, moderators, and tests for mediation. *Journal of applied psychology*, *69*(2), 307.

Janssen, C., Daamen, T. A., & Verdaas, C. (2021). Planning for urban social sustainability: Towards a human-centred operational approach. *Sustainability (Switzerland)*, 1–17.

Jenkins, A., Martin, C., Keeffe, G., Broersma, S., & Dobbelsteen, A. (2020). Designing the future to predict the future: An 'urban-first' approach to co-creating zero-carbon neighbourhoods. *35th Passive and Low Energy Architecture Conference*, 1–7.

Jenner, B., Flick, U., von Kardoff, E., & Steinke, I. (2004). *A companion to qualitative research* (Vol. 1). Sage.

Jennings, V., & Bamkole, O. (2019). The relationship between social cohesion and urban green space: An avenue for health promotion. *International Journal of Environmental Research and Public Health*, 1–14.

Jenson, J. (1998). *Mapping social cohesion: The state of canadian research*. Canadian Policy Research Network.

Jenson, J. (2010). The concept of social cohesion: Overview and historical perspective. *Defining and Measuring Social Cohesion*, 1–44.

Johansson, K., Laflamme, L., & Eliasson, M. (2012). Adolescents' perceived safety and security in public space—a swedish focus group study with a gender perspective. *Young*, *20*(1), 69–88.

Jones, H., Neal, S., Mohan, G., Connell, K., Cochane, A., & Bennet, K. (2015). Urban multiculture and everyday encounters in semi-public, franchised cafe spaces. *The socialogical Review*, 644–661.

Jordan, A. J., & Turnpenny, J. R. (2015). *The tools of policy formulation*. Edward Elgar Publishing Limited.

Jupp, E. (2014). Women, communities, neighbourhoods: Approaching gender and feminism within uk urban policy. *Antipode*, 1304–1322.

Jurkovič, N. B. (2014). Perception, experience and the use of public urban spaces by residents of urban neighbourhoods. *Urbani izziv*, *25*(1).

Kahana, E., Lovegreen, L., Kahana, B., & Kahana, M. (2003). Person, environment, and person-environment fit as influences on residential satisfaction of elders. *Environment and behavior*, *35*(3), 434–453.

Kalra, V. S., & Kapoor, N. (2009a). Interrogating segregation, integration and the community cohesion agenda. *Journal of Ethnic and Migration Studies*, 1397–1415.

Kalra, V. S., & Kapoor, N. (2009b). Interrogating segregation, integration and the community cohesion agenda. *Journal of ethnic and migration studies*, *35*(9), 1397–1415.

Kamalipour, H., Aelbrecht, P., & Peimani, N. (2023). *The routledge handbook of urban design research methods*. Routledge.

Karsono, B., Saleh, B. M., Chung, C. O., & Wahid, J. (2021). Place attachment in the riverfront public space case of malaysia. *IOP Conference Series*, 1–9.

Kearns, A., & Forrest, R. (2000). Social cohesion and multilevel urban governance. *Urban Studies*, 995–1017.

Khalilin, A., & Fallah, S. N. (2018). Role of social indicators on vitality parameter to enhance the quality of women's communal life within an urban public space (case: Isfahan's traditional bazaar, iran). *Frontiers of Architectural Research*, 440–454.

Khemri, M. Y., Melis, A., & Caputo, S. (2020). Sustaining the liveliness of public spaces in el houma through placemaking. *The Journal of Public Space*, 129–152.

Kim, H., & Yang, S. (2017). Neighborhood walking and social capital: The correlation between walking experience and individual perception of social capital. *Sustainability (Switzerland)*, 1–16.

Kim, J., & Kaplan, R. (2004). Physical and psychological factors in sense of community: New urbanist kentlands and nearby orchard village. *Environment and Behavior*, 313–340.

Kingdon, J. W. (1995). The policy window, and joining the streams. In J. W. Kingdon & A. Agendas (Eds.), *And public policies* (pp. 165–195). HarperCollins College Publishers.

Kirwan, R. M. (1989). Finance for urban public infrastructure. *Urban Studies*, 285–300.

Kitchin, R., Lauriault, T. P., & McArdle, G. (2015). Knowing and governing cities through urban indicators, city benchmarking and real-time dashboards. *Regional Studies, Regional Science*, *2*(1), 6–28.

Kiverstein, J. D. (2024). The sociomaterial theory of affordances. In *The modern legacy of gibson's affordances for the sciences of organisms* (pp. 26–41). Routledge.

Knight, C., Conn, C., Crick, T., & Brooks, S. (2023). Divergences in the framing of inclusive education across the UK: a four nations critical policy analysis. *Educational Review*, *0*(0), 1–17. https://doi.org/10.1080/00131911.2023.2222235

Kodinariya, T. M., Makwana, P. R., et al. (2013). Review on determining number of cluster in k-means clustering. *International Journal*, *1*(6), 90–95.

Komac, U. (2016). Public space as a public good: Some reflections on public space to enjoy solitude. *Athens: ATINER'S Conference Paper Series, No: ARC2016-2008*.

Konsti-Laakso, S., & Rantala, T. (2018). Managing community engagement: A process model for urban planning. *European Journal of Operational Research*, 1040–1049.

Korllos, T. S. (1994). Uncovering simmel's forms and social types in social settings. *International Social Science Review*, *69*(1/2), 17–22.

Kotzebue, J. R. (2016). The eu integrated urban development policy: Managing complex processes in dynamic places. *European Planning Studies*, 1098–1117.

Kyttä, M., Oliver, M., Ikeda, E., Ahmadi, E., Omiya, I., & Laatikainen, T. (2018). Children as urbanites: Mapping the affordances and behavior settings of urban environments for finnish and japanese children. *Children's Geographies*, *16*(3), 319–332.

Langen, D. (1969). Ecological psychology. concepts and methods for studying the environment of human behavior.

Langstraat, F., & Melik, R. V. (2013). Challenging the 'end of public space': A comparative analysis of publicness in british and dutch urban spaces. *Journal of urban design*, 429–448.

Lara-Hernandez, J. A., Melis, A., & Lehmann, S. (2019). Temporary appropriation of public space as an emergence assemblage for the future urban landscape: The case of mexico city. *Future Cities and Environment*, 1–22.

Larsen, E. L. (2013). People and place: The interrelated connections between interactions, perceptions and space. In *Neighbourhood structure and health promotion* (pp. 77–90). Springer.

Laurence, J. (2011). The effect of ethnic diversity and community disadvantage on social cohesion: A multi-level analysis of social capital and interethnic relations in uk communities. *European Sociological Review*, 70–89.

Lawrence, R. J. (2010). Urban areas in the context of human ecology. In *The routledge handbook of urban ecology* (pp. 62–71). Routledge.

Lawson, H. A. (2005). Empowering people, facilitating community development, and contributing to sustainable development: The social work of sport, exercise, and physical education programs. In E. a. Sport (Ed.), *And society* (pp. 135–160).

Lawton, M. P. (1974). Social ecology and the health of older people. *American Journal of Public Health*, *64*(3), 257–260.

Lawton, M. P. (1989). Environmental proactivity in older people. Springer Publishing Company.

Lawton, M. P. (1990). An environmental psychologist ages. In *Environment and behavior studies: Emergence of intellectual traditions* (pp. 339–363). Springer.

Lawton, M. P. (2013). Behavior-relevant ecological factors. In *Social structure and aging* (pp. 57–78). Psychology Press.

Lawton, M. P., & Nahemow, L. (1973). Ecology and the aging process. *American Psychological Association*.

Lebrusán, I., & Gómez, M. V. (2022). The importance of place attachment in the understanding of ageing in place:"the stones know me". *International journal of environmental research and public health*, *19*(24), 17052.

Leclercq, E., Pojani, D., & Van Bueren, E. (2020). Is public space privatization always bad for the public? mixed evidence from the united kingdom. *Cities*, *100*, 102649.

Lee, S., Yoo, C. J., & Seo, J. (2018). Are perceived neighbourhood built environments associated with social capital? evidence from the 2012 seoul survey in south korea. *International Journal of Urban Sciences*, 349–365.

Lefebvre, H. (1991). *The production of space*. Blackwell.

Lefebvre, H. (2014). The production of space. In J. J. Gieseking, W. Mangold, C. Katz, S. Low, & S. Saegert (Eds.), *The people, place, and space reader* (p. 5). Routledge.

Levasseur, M., Gauvin, L., Richard, L., Kestens, Y., Daniel, M., & Payette, H. (2011). Associations between perceived proximity to neighborhood resources, disability, and social participation among community-dwelling older adults: Results from the voisinuage study. *Archives of Physical Medicine and Rehabilitation*, 1979–1986.

Levitas, R. (2005). *The inclusive society?: Social exclusion and new labour*. Springer.

Levy, Y., & Ellis, T. J. (2006). A systems approach to conduct an effective literature review in support of information systems research. *Informing Science*, 181–212.

Lewicka, M. (2011). On the varieties of people's relationships with places: Hummon's typology revisited. *Environment and Behavior*, 676–709.

Lewis, H., & Craig, G. (2014). 'multiculturalism is never talked about': Community cohesion and local policy contradictions in england. *Policy and politics*, 21–38.

Leyden, K. M. (2003). Social capital and the built environment: The importance of walkable neighborhoods. *American journal of public health*, *93*(9), 1546–1551.

Leyland, A. H., & Groenewegen, P. P. (2020). Context, composition and how their influences vary. In *Multilevel modelling for public health and health services research: Health in context* (pp. 107–122). Springer.

Li, Q., Liu, Y., Yang, L., Ge, J., Chang, X., & Zhang, X. (2023). The impact of urban green space on the health of middle-aged and older adults. *Frontiers in public health*, *11*, 1244477.

Liang, D., De Jong, M., Schraven, D., & Wang, L. (2022). Mapping key features and dimensions of the inclusive city: A systematic bibliometric analysis and literature study. *International Journal of Sustainable Development & World Ecology*, *29*(1), 60–79.

Lindgren, J. (2010). Spaces of social inclusion and exclusion—a spatial approach to education restructuring.

Liu, Z., Tan, Y., & Chai, Y. (2020). Neighbourhood-scale public spaces, inter-group attitudes and migrant integration in beijing, China. *Urban Studies*, 2491–2509.

Lloyd, K., Fullagar, S., & Reid, S. (2016). Where is the 'social' in constructions of 'liveability'? exploring community, social interaction and social cohesion in changing urban environments. *Urban Policy and Research*, 343–355.

Lofland, L. H. (1998). *The public realm: Exploring the city's quintessential social territory*. Aldine de Gruyter.

Lomas, M. J., Ayodeji, E., & Brown, P. (2021). Experiences of place attachment and mental wellbeing in the context of urban regeneration. *Health & Place*, *70*, 102604.

López-Delgado, E. O., Villa-Navarro, F. A., & Winemiller, K. O. (2024). Functional diversity in relation to the longitudinal gradient of a species-rich neotropical river. *Journal of Tropical Ecology*, *40*, e22.

Lotfata, A., & Ataöv, A. (2020). Urban streets and urban social sustainability: A case study on bagdat street in kadikoy, istanbul. *European Planning Studies*, 1735–1755.

Low, S., & Smith, N. (2006). *The politics of public space*. Routledge.

Low, S. M. (2000). On the plaza: The politics of public space and culture.

Low, S. M. (2009). Towards an anthropological theory of space and place.

Lowndes, V., & Thorp, L. (2011). Interpreting 'community cohesion': Modes, means and mixes. *Policy & Politics*, 513–532.

Lund, B. (2007). Major, blair and the third way in social policy. *Social Policy Administration: An International Journal of Policy and Research*, 43–58.

Lynch, K. (2014). The city image and its elements (1960). *The People, Place, and Space Reader*, (1960), 50–55. https://doi.org/10.4324/9781315816852

Lysaght, R., Cobigo, V., & Hamilton, K. (2012). Inclusion as a focus of employment-related research in intellectual disability from 2000 to 2010: A scoping review. *Disability & Rehabilitation*, 1339–1350.

M. McPherson, J., & Jetz, W. (2007). Effects of species' ecology on the accuracy of distribution models. *Ecography*, *30*(1), 135–151.

MacKinnom, D. P., Cheong, J. W., & Pirlott, A. G. (2012). Introduction to statistical mediation analysis. In H. Cooper (Ed.), *Handbook of researcg method in psychology* (pp. 313–332). American Psychological Association.

MacKinnon, D. P., Fairchild, A. J., & Fritz, M. S. (2007). Mediation analysis. *Annu. Rev. Psychol.*, *58*(1), 593–614.

Madanipour, A. (1996). *Design of urban space: An inquiry into a social-spatial process*. John Wiley & Sons.

Madanipour, A. (2003). *Public and private spaces of the city*. Routledge.

Madanipour, A. (2006). Roles and challenges of urban design. *Journal of Urban Design*, 173–193.

Madanipour, A. (2019). Rethinking public space: between rhetoric and reality. *2*, *24*(1), 38–46. https://doi.org/10.1057/s41289-019-00087-5

Magalhães, C. D., & Carmona, M. (2006). Innovations in the management of public space: Reshaping and refocusing governance. *Planning Theory & Practice*, 289–303.

Mantey, D. (2015). The role of public spaces in creating place attachment (example of zacisze, warsaw housing estate). *Miscellanea Geographica*, 36–42.

Manuel, J., Vigar, G., Bartindale, T., & Comber, R. (2017). Participatory media: Creating spaces for storytelling in neighbourhood planning. *Proceedings of the 2017 CHI conference on human factors in computing systems*, 1688–1701.

Marans, R. W. (2015). Quality of urban life environmental sustainability studies: Future linkage opportunities. *Habitat International*, 47–52.

Markovich, J. (2015). 'they seem to divide us': Social mix and inclusion in two traditional urbanist communities. *Housing Studies*, 139–168.

Martindale, K. A. (2011). Sport and the city: The role of sport and recreation in planning and urban design. In A. C. Roibás & E. Stamatakis (Eds.), *Design for sport* (p. 22). Routledge.

Mateo-Babiano, I. B. (2012). Public life in bangkok's urban spaces. *Habitat International*, 452–461.

Mattei, P., & Broeks, M. (2018). From multiculturalism to civic integration: Citizenship education and integration policies in the netherlands and england since the 2000s. *Ethnicities*, 23–42.

Mazumdar, S., Learnihan, V., Cochrane, T., & Davey, R. (2018). The built environment and social capital: A systematic review. *Environment and Behavior*, 119–158.

Mazumdar, S., Qi, J., Thakker, D., & Goodchild, B. (2023). Understanding urban planning outcomes in the uk: Practitioner perspectives in outcome assessment. *International Journal of E-Planning Research*, 1–40.

McClimens, A., Doel, M., Ibbotson, R., Patridge, N., Muscroft, E., & Lockwood, L. (2012). Ow do the 'peace gardens' make you feel? public space and personal wellbeing in city centre sheffield. *Journal of Urban Design*, 117–133.

McGhee, D. (2003). Moving to 'our' common ground – a critical examination of community cohesion discourse in twenty-first century britain. *The Sociological Review*, 376–404.

McGinn, N. F. (2008). Education policies to promote social cohesion. In W. K. Cummings & J. H. Williams (Eds.), *Policy-making for education reform in developing countries: Policy options and strategies* (pp. 1–25). Scarecrow Education.

McLeroy, K. R., Bibeau, D., Steckler, A., & Glanz, K. (1988). An ecological perspective on health promotion programs. *Health education quarterly*, *15*(4), 351–377.

McMillan, D. W., & Chavis, D. M. (1986). Sense of community: A definition and theory. *Journal of Community Psychology*, 6–23.

Mcmillan, D. W., & Chavis, D. M. (2019). Perceptions of neighborhood environment, sense of community, and self-rated health: An age-friendly city project in hong kong. *Journal of Urban Health*, 276–288.

Mehta, V. (2014). Evaluating public space. *Journal of Urban Design*, 53–88.

Mehta, V. (2019a). The street: A fluide place of social cohesion. In P. Aelbrecht & Q. Stevens (Eds.), *Public space design and social cohesion: An international comparison* (pp. 315–375). Taylor & Francis.

Mehta, V. (2019b). Streets and social life in cities: A taxonomy of sociability. *Urban Design International*, 16–37.

Mehta, V., & Bosson, J. K. (2021). Revisiting lively streets: Social interactions in public space. *Journal of Planning Education and Research*, 160–172.

Mehta, V. (2009). Look closely and you will see, listen carefully and you will hear: Urban design and social interaction on streets. *Journal of urban design*, *14*(1), 29–64.

Ministry of Housing Communities & Local Government (MHCLG). (2019). National Design Guide, 70.

Mitchell, D. (2003). *The right to the city: Social justice and the fight for public space*. Guilford press.

Modie-Moroka, T., Dube, M. W., Setume, S. D., Kgalemang, M., Kebaneilwe, M. D., Gabaitse, R., Madigela, T., et al. (2020). Pathways to social capital and the botho/ubuntu ethic in the urban space in gaborone, botswana. *Global Social Welfare*, 231–243.

Montgomery, J. (1998). Making a city: Urbanity, vitality and urban design. *Journal of urban design*, *3*(1), 93–116.

Moore, G., Croxford, B., Adams, M., Refaee, M., Cox, T., & Sharples, S. (2006). *Urban environmental quality: Perceptions and*. Urban Regeneration; Sustainability, 785-794.

Morgan, D. L. (2007). Paradigms lost and pragmatism regained: Methodological implications of combining qualitative and quantitative methods. *Journal of mixed methods research*, *1*(1), 48–76.

Morrison, N., & Burgess, G. (2014). Inclusionary housing policy in england: The impact of the downturn on the delivery of affordable housing through section 106. *Journal of Housing and the Built Environment*, 423–438.

Mouratidis, K., & Poortinga, W. (2020). Built environment, urban vitality and social cohesion: Do vibrant neighborhoods foster strong communities? *Landscape and Urban Planning*, 1–9.

Mullenbach, L. E., Mowen, A. J., Baker, B. L., & Stanis, S. A. (2022). Can urban parks bridge deep divides? assessing the effects of inter-racial social interaction in parks and public spaces on trust. *Journal of Leisure Research*, 450–472.

Muminovic, M. (2017). Place identity and sustainable urban regeneration: Public space in canberra city centre. *International Journal of Sustainable Development and Planning*, 734–743.

Murphy, K. (2012). *The social pillar of sustainable development: A literature review and framework for policy analysis*. Science, Practice; Policy, 15-29.

Narayan, D. (2005). Conceptual framework and methodological challenges. *Measuring empowerment*, *1*.

Navarrete-Hernandez, P., Vetro, A., & Concha, P. (2021). Building safer public spaces: Exploring gender difference in the perception of safety in public space through urban design interventions. *Landscape and Urban Planning*, 1–13.

NCS. (2024, September 29). *About us* [Retrieved from National Citizen Service]. Retrieved September 29, 2024, from https://wearencs.com/about-us

Nelischer, C., & Loukaitou-Sideris, A. (2023). Intergenerational public space design and policy: A review of the literature. *Journal of Planning Literature*, 19–32.

Nguyen, H. (2019). From pedestrian thoroughfare to public space: The social life of the esplanade underpass. *The Journal for Undergraduate Ethnography*, 1–17.

Nguyen, T. V., Han, H., & Sahito, N. (2019). Role of urban public space and the surrounding environment in promoting sustainable development from the lens of social media. *Sustainability (Switzerland)*, 1–15.

Novy, A., Swiatek, D. C., & Moulaert, F. (2012). Social cohesion: A conceptual and political elucidation. *Urban Studies*, 1873–1889.

Noyman, A., & Larson, K. (2020). A deep image of the city: Generative urban-design visualization. *Proceedings of the 11th annual symposium on simulation for architecture and urban design*, 1–8.

Ntounis, N., Saga, R. S., Warnaby, G., Loroño-Leturiondo, M., & Parker, C. (2023). Reframing high street viability: A review and synthesis in the english context. *Cities*, 1–10.

Nyumba, T., Wilson, K., Derrick, C., & Mukherjee, N. (2018). The use of focus group discussion methodology: Insights from two decades of application in conservation. *Qualitative methods for eliciting judements for diecision-making*, 20–33.

O'Brien, P., & Pike, A. (2019). 'deal or no deal?'governing urban infrastructure funding and financing in the uk city deals. *Urban Studies*, *56*(7), 1448–1476.

Office, H. (2001). *Community cohesion: A report of the independent review team.*

Office, H. (2015a). *Counter-extremism strategy.*

Office, H. (2015b). *Prevent duty guidance: For higher education institutions in england and wales' of 2015.*

Office, H. (2023). *Prevent duty guidance: For england and wales.*

Oidjarv, H. (2018). The tale of two communities: Residents' perceptions of the built environment and neighborhood social capital. *SAGE Open*, 1–20.

Okoli, C. (2015). A guide to conducting a standalone systematic literature review. *Communications of the Association for Information Systems*, 879–910.

Oldenberg, R. (1989). *The great good place: Cafe´s, coffee shops, bookstores, bars, hair salons and the other hangouts at the heart of a community*. MA: De Capo Press.

Oldenberg, R. (2007). The character of third places. In S. Tiesdell & M. Carmona (Eds.), *Urban design reader*. Architectural Place.

Oldendick, R. W. (2012). Survey research ethics. In *Handbook of survey methodology for the social sciences* (pp. 23–35). Springer.

Orazani, S. N., Reynolds, K. J., & Osborne, H. (2023). What works and why in interventions to strengthen social cohesion: A systematic review. *Journal of Applied Social Psychology*, *53*(10), 938–995.

Ortiz, A., Garcia-Ramon, M., & Prats, M. (2004). Women's use of public space and sense of place in the raval. *Barcelona) Anna. GeoJournal*, 219–227.

Ortiz, C., Franco Calderon, A. M., Millan Franco, G., & Jaramillo Diaz, I. (2025). Spatialising intersectionality: An approach to public space design in self-built neighbourhoods in cali, colombia. *Urban Design International*, 1–16.

Orum, A. M. (1998). The urban imagination of sociologists: The centrality of place. *The Sociological Quarterly*, *39*(1), 1–10.

Paganoni, M. C. (2012). City branding and social inclusion in the glocal city. *Mobilities*, *7*(1), 13–31.

Paranagamage, P. A., Price, A., & Khandokar, F. (2010). Social capital in action in urban environments: An intersection of theory, research and practice literature. *Journal of Urbanism*, 231–252.

Park, Y., & Garcia, M. (2020). Pedestrian safety perception and urban street settings. *International journal of sustainable transportation*, *14*(11), 860–871.

Parker, D., & Karner, C. (2010). Reputational geographies and urban social cohesion. *Ethnic and Racial Studies*, 1451–1470.

Parkinson, J. (2013). Political public space: What it is, why it is special and why standard spatial nostrums mislead. *Policy and Politics*, 299–302.

Paterson, E. (2012). Urban design and the national planning policy framework for england. *Urban Design International*, 144–155.

Pavey, B. (2006). Human capital, social capital, entrepreneurship and disability: An examination of some current educational trends in the uk. *Disability & Society*, 217–229.

Pawson, R., & Tilley, N. (1997). Realistic evaluation.

Peace, S., Rowles, G. D., & Bernard, M. (2013). Social interactions in public spaces and places: A conceptual overview. *Environmental gerontology: Making meaningful places in old age*, 25–49.

Peel, D., & Parker, C. (2017). Planning and governance issues in the restructuring of the high street. *Journal of Place Management and Development*, 404–418.

Pemberton, S. (2008). Social inclusion and the 'get heard' process. *Implications for the horizontal and vertical integration of governance and policy in the UK. Public Policy and Administration*, 127–143.

Peng, Y., Feng, T., & Timmermans, H. (2019). A path analysis of outdoor comfort in urban public spaces. *Building and Environment*, 459–467.

Perovic, S., & Folic, K. N. (2012). Visual perception of public open spaces in niksic. *Procedia - Social and Behavioral Sciences*, *68*, 921–933.

Peters, K., & de Haan, H. (2011). Everyday spaces of inter-ethnic interaction: The meaning of urban public spaces in the netherlands. *Leisure/ Loisir*, 169–190.

Peterson, M. (2017). Living with difference in hyper-diverse areas: How important are encounters in semi-public spaces? *Social and Cultural Geography*, 1067–1085.

Petticrew, M., & Roberts, H. (2006). How to appraise the studies: An introduction to assessing study quality. In M. Petticrew & H. Roberts (Eds.), *Systematic reviews in the social* (pp. 125–163). A Practical Guide.

Petts, J., Owens, S., & Bulkeley, H. (2008). Crossing boundaries: Interdisciplinarity in the context of urban environments. *Geoforum*, *39*(2), 593–601.

Phillimore, J. (2012a). Implementing integration in the uk: Lessons for integration theory, policy and practice. *Policy and politics*, 525–545.

Phillimore, J. (2012b). Implementing integration in the uk: Lessons for integration theory, policy and practice. *Policy & Politics*, *40*(4), 525–545.

Piekut, A., & Valentine, G. (2017). Spaces of encounter and attitudes towards difference: A comparative study of two european cities. *Social Science Research*, 175–188.

Pieterse, E. (2004). Untangling 'integration' in urban development policy debates. *Urban Forum*, 1–35.

Piroozfar, P., Farr, E. R., Aboagye-Nimo, E., & Osei-Berchie, J. (2019). Crime prevention in urban spaces through environmental design: A critical uk perspective. *Cities*, 1–11.

Pittaluga, P. (2020). Pioneering urban practices in transition spaces. *City, Territory and Architecture*, 1–10.

Portegijs, E., Keskinen, K. E., Tsai, L.-T., Rantanen, T., & Rantakokko, M. (2017). Physical limitations, walkability, perceived environmental facilitators and physical activity of older adults in finland. *International journal of environmental research and public health*, *14*(3), 333.

Pot, F. J., van Wee, B., & Tillema, T. (2021). Perceived accessibility: What it is and why it differs from calculated accessibility measures based on spatial data. *Journal of Transportation Geography*, 1–11.

Pratt, A. C. (2010). Creative cities: Tensions within and between social, cultural. *City, Culture and Society*, 13–20.

Preacher, K. J., & Hayes, A. F. (2004). Spss and sas procedures for estimating indirect effects in simple mediation models. *Behavior research methods, instruments, & computers*, *36*(4), 717–731.

Priest, N., Paradies, Y., Ferdinand, A., Rouhani, L., & Kelaher, M. (2014). Patterns of intergroup contact in public spaces: Micro-ecology of segregation in australian communities. *Societies*, 30–44.

Pugalis, L. (2009). The culture and economics of urban public space design: Public and professional perceptions. *Urban Design International*, 215–230.

Punter, J. (1990). The privatisation of the public realm. *Planning Practice and Research*, 9–16.

Punter, J. (2007a). Developing urban design as public policy: Best practice principles for design review and development management. *Journal of Urban Design*, 167–202.

Punter, J. (2011). Urban design and the english urban renaissance1999–2009: A review and preliminary evaluation [20111357-4809 Print/1469-9664 Online/11/010001-41q2011 Taylor & FrancisDOI: 1-41], *16*(1), 1–41. https://doi.org/10.1080/13574809.2011.521007,

Punter, J. (2007b). Developing urban design as public policy: Best practice principles for design review and development management. *Journal of Urban Design*, *12*(2), 167–202. https://doi.org/10.1080/13574800701306195

Purcell, M. (2002). Excavating lefebvre: The right to the city and its urban politics of the inhabitant. *GeoJournal*, *58*(2), 99–108.

Purwanto, E., & Harani, A. (2020). Understanding the place attachment and place identity in public space through the ability of community mental map. *IOP Conference Series*, 1–11.

Qi, J., Mazumdar, S., & Vasconcelos, A. (2024). Understanding the relationship between urban public space and social cohesion: A systematic review. *International Journal of Community Well-Being*, 1–58.

Qiu, Z., Jin, B., Yun, B., Wang, Z., & Pu, X. (2025). Potential assessment and community environment support strategies for social interaction, based on the spatiotemporal behavior of accompanying elderly migrants: A case study in hangzhou. *Land*, *14*(5), 1043.

Quinn, A. G. (2008). Social capital: An assessment of its relevance as a conceptual and policy tool. *Centre for Civil Society*, 1–30.

Quinn, B., Colombo, A., Lindström, K., McGillivray, D., & Smith, A. (2021). Festivals, public space and cultural inclusion: Public policy insights. *Journal of Sustainable Tourism*, *29*(11-12), 1875–1893.

Raman, S. (2010). Designing a liveable compact city physical forms of city and social life in urban neighbourhoods. *Built environment*, 63–80.

Ratcliffe, P. (2012). Community cohesion. *Reflections on a flawed paradigm. Critical Social Policy*, 262–281.

Ravagnan, C., Rossi, F., & Amiriaref, M. (2022). Sustainable mobility and resilient urban spaces in the united kingdom. practices and proposals. *Transportation Research Procedia*, 164–171.

Ravazzoli, E., & Torricelli, G. P. (2017). Urban mobility and public space. a challenge for the sustainable liveable city of the future. *The Journal of Public Space*, 37–50.

Reynolds, L. (2021). Reconsidering place branding: 'connecting the dots' between placemaking, policy making and sustainable development. *Welsh Economic Review*, 14–22.

Rhodes, R. A. (1997). *Understanding governance: Policy networks, governance, reflexivity and accountability*. Open University.

Rishbeth, C., Blachnicka-Ciacek, D., & Darling, J. (2019). Participation and wellbeing in urban greenspace: 'curating sociability' for refugees and asylum seekers. *Geoforum*, *106*(August), 125–134. https://doi.org/10.1016/j.geoforum.2019.07.014

Robinson, D. (2005). The search for community cohesion: Key themesand dominant concepts of the public policy agenda. *Urban Studies*, 1411–1427.

Roche, M. (2004). Social policy and social capital: A clear case of putting merit before method? *Social Policy and Society*, 97–111.

Rucks-Ahidiana, Z., & Bierbaum, A. H. (2015). Qualitative spaces: Integrating spatial analysis for a mixed methods approach. *International Journal of Qualitative Methods*, 92–103.

Rutter, J. (n.d.). The state of us: Community strength and cohesion in the uk a foundational report by british future and the belong network to the independent commission on community and cohesion.

Salaza, K., & Wilxoc, M. (2013). Enhancing the value of public spaces. *Purdue University Extention*, 1–110.

Salimi, M., Foroutan, M., & Naghdi, A. (2019). Analyzing social cohesion in open spaces of multiethnic poor neighborhoods: A grounded theory study. *Journal of Architecture and Urbanism*, 1–13.

Sallis, J. F., Owen, N., Fisher, E., et al. (2015). Ecological models of health behavior. *Health behavior: Theory, research, and practice*, *5*(43-64).

Salvadó, M., Schmitt, C., & Bustamante, W. (2020). Tangible patterns and levels of belonging in the neighborhood's public spaces. *IOP Conference Series*, 1–13.

Sampson, R. J., & Raudenbush, S. W. (1999). Systematic social observation of public spaces: A new look at disorder in urban neighborhoods. *American journal of sociology*, *105*(3), 603–651.

Sampson, R. J., Raudenbush, S. W., & Earls, F. (1997). Neighborhoods and violent crime: A multilevel study of collective efficacy. *science*, *277*(5328), 918–924.

Sattarzadeh, D. (2018). The effect of designing urban public spaces on place attachment (case study: Tabriz, iran). *Space Ontology International Journal*, 53–64.

Scannell, L., & Gifford, R. (2010). Defining place attachment: A tripartite organizing framework. *Journal of environmental psychology*, *30*(1), 1–10.

Scheutz, M., & Mayer, T. (2016). Combining agent-based modeling with big data methods to support architectural and urban design. In *Understanding complex urban systems: Integrating multidisciplinary data in urban models* (pp. 15–31). Springer.

Schiefer, D., & van der Noll, J. (2017). The essentials of social cohesion: A literature review. *Social Indicators Research*, 579–603.

Schmidt, S., & Németh, J. (2010). Space, place and the city: Emerging research on public space design and planning. *Journal of Urban Design*, *15*(4), 453–457.

Schwanen, T., Lucas, K., Akyelken, N., Solsona, D. C., Carrasco, J., & Neutens, T. (2015). Rethinking the links between social exclusion and transport disadvantage through the lens of social capital. In *Transportation research part a: Policy and practice* (pp. 123–135).

Seamon, D., & Gill, H. K. (2016). Qualitative approaches to environment-behavior research. research methods for environmental psychology, 5.

Shirazi, M. R. (2019). Mapping neighbourhood outdoor activities: Space, time, gender and age. *Journal of Urban Design*, 715–737.

Sila-Nowicka, K., Paule, J. G., et al. (2016). Sensing spatiotemporal patterns in urban areas: Analytics and visualizations using the integrated multimedia city data platform. *Built Environment*, *42*(3), 415–429.

Sim, J., & Waterfield, J. (2019). Focus group methodology: Some ethical challenges. *Quality & quantity*, *53*(6), 3003–3022.

Simmel, G. (2009). *Sociology: Inquiries into the construction of social forms*. Brill.

Skaburskis, A. (2008). The origin of "wicked problems". *Planning Theory & Practice*, *9*(2), 277–280.

Smith, C., & Levermore, G. (2008). Designing urban spaces and buildings to improve sustainability and quality of life in a warmer world. *Energy Policy*, 4558–4562.

Soares, I., Weitkamp, G., & Yamu, C. (2020). Public spaces as knowledgescapes: Understanding the relationship between the built environment and creative

encounters at dutch university campuses and science parks. *International Journal of Environmental Research and Public Health*, 1–30.

Soopramanien, D., Daryanto, A., & Song, Z. (2023). Urban residents' environmental citizenship behaviour: The roles of place attachment, social norms and perceived environmental responsibility. *Cities*, *132*, 104097.

Southworth, M. (2014). Public life, public space, and the changing art of city design. *Journal of urban design*, *19*(1), 37–40.

Spierings, B., van Melik, R., & van Aalst, I. (2016). Parallel lives on the plaza: Young dutch women of turkish and moroccan descent and their feelings of comfort and control on rotterdam's schouwburgplein. *Space and Culture*, *19*(2), 150–163.

Stevens, Q., Daly, J., & Dovey, K. (2024). Designing for possibility in public space: Affordance, assemblage, and ant. *Urban Design International*, *29*(2), 94–104.

Stock, K. (2018). Mining location from social media: A systematic review. computers. *Environment and Urban Systems*, 209–240.

Stoklosa, J., Blakey, R. V., & Hui, F. K. (2022). An overview of modern applications of negative binomial modelling in ecology and biodiversity. *Diversity*, *14*(5), 320.

Stokols, D., Allen, J., & Bellingham, R. L. (1996). The social ecology of health promotion: Implications for research and practice. *American Journal of Health Promotion*, *10*(4), 247–251.

Subiza-Pérez, M., Vozmediano, L., & Juan, C. J. (2019). A systematic social observation tool to measure the restorative potential of urban settings. *Psychology: Bilingual Journal of Environmental Psychology*, 257–267.

Suri, H. (2013). Epistemological pluralism in research synthesis methods. *International journal of qualitative studies in education*, *26*(7), 889–911.

Sutton, L., Mueter, F. J., Bluhm, B. A., & Iken, K. (2021). Environmental filtering influences functional community assembly of epibenthic communities. *Frontiers in Marine Science*, *8*, 736917.

Talen, E. (1999). Sense of community and neighbourhood form: An assess- ment of the social doctrine of new urbanism. *Urban. Urban Studies*, 1361–1379.

Talen, E. (2000). Measuring the public realm: A preliminary assessment of th elink between public space and sense of community. *Journal of Architectural and Planning Research*, 344–360.

Tallon, A. R., & Bromley, R. D. (2004). Exploring the attractions of city centre living: Evidence and policy implications in british cities. *Geoforum*, 771–787.

Tashakkori, A., & Teddlie, C. (2010). *Sage handbook of mixed methods in social & behavioral research*. sage.

Taylor-Gooby, P. (2012). The civil society route to social cohesion. *International Journal of Sociology and Social Policy*, 368–385.

The Ministry of Housing, Communities and Local Government. (2024, September). *Guidance for the development of community led local development strategies* [Retrieved from GOV.UK]. https://assets.publishing.service.gov.uk/media/5af4008e40f0b622d7cc6d6c/ESIF-GN-1-018_Guidance_for_Development_of_CLLD_Strategies_v2.pdf

Thorsson, S., Honjo, T., Lindberg, F., Eliasson, I., & Lim, E. (2007). Thermal comfort and outdoor activity in japanese urban public places. *Environment and behaviour*, 660–684.

Tikly, L. (2022). Racial formation and education: A critical analysis of the sewell report. *Ethnicities*, 857–881.

Tosun, J., & Lang, A. (2017). Policy integration: Mapping the different concepts. *Policy Studies*, 553–570.

Touihri-Mebarek, D. (2023). Economic disparities in great britain during the covid-19 pandemic: The sewell report and the myth of a post-racial society. *French Journal of British Studies*, 1–18.

Trawalter, S., Hoffman, K., & Palmer, L. (2021). Out of place: Socioeconomic status, use of public space, and belonging in higher education. *Journal of Personality and Social Psychology*, 131–144.

Trillo, C. (2016). Quality of public spaces and sustainable urban development: Success and failures in fighting social exclusion. *Urban Regeneration and Sustainability*, 469–478.

Tuan, Y.-F. (1979). Space and place: Humanistic perspective. In *Philosophy in geography* (pp. 387–427). Springer.

Tudor, S. (2024, July). King's speech 2024: Devolved affairs [Accessed: YYYY-MM-DD]. https://lordslibrary.parliament.uk/research-briefings/lln-2024-0031/

Ujang, N. (2012). Place attachment and continuity of urban place identity. *Procedia - Social and Behavioral Sciences*, 156–167.

Ujang, N., Kozlowski, M., & Maulan, S. (2018). Linking place attachment and social interaction: Towards meaningful public places. *Journal of Place Management and Development*, *11*(1), 115–129.

Ujang, N., & Zakariya, K. (2015). The notion of place, place meaning and identity in urban regeneration. *Procedia-social and behavioral sciences*, *170*, 709–717.

UNDP. (2022, March 11). *Strenthening social cohesion: Conceptual framing and programme implications* [Retrieved from United Nation Development Programme]. Retrieved March 11, 2022, from https://www.undp.org/publications/strengthening-social-cohesion-conceptual-framing-and-programming-implications#modal-publication-download

UN-Habitat. (2015). *Global public space toolkit: From global principles to local policies and practice. united nations human settlements programme (un-habitat).*

UN-Habitat. (2018). *Sdg indicator 11.7.1 training module: Public space.*

Urquhart, C. (2022). Grounded theory for qualitative research: A practical guide.

Vale de Paula, P., & Manuel Gonçalves, J. (2024). Urban regeneration of water fronts: Literature review. *International Urban Planning Research Semina*, 1–14.

Valentine, G. (2008). Living with difference: Reflections on geographies of encounter. *Progress in Human Geography*, 323–337.

Wan, C., Shen, G. Q., & Choi, S. (2021). Underlying relationships between public urban green spaces and social cohesion: A systematic literature review. *City, Culture and Society*, 1–15.

Wang, X., & Liu, Z. (2022). Neighborhood environments and inclusive cities: An empirical study of local residents' attitudes toward migrant social integration in beijing, China. *Landscape and Urban Planning*, 1–10.

Ward, M. (2024, June 29). *Which areas have benefited from the levelling up fund?* [Retrieved from House of Commons Library]. Retrieved June 29, 2024, from https://commonslibrary.parliament.uk/which-areas-have-benefited-from-the-levelling-up-fund/

Ward Thompson, C., Aspinall, P., Roe, J., Robertson, L., & Miller, D. (2016). Mitigating stress and supporting health in deprived urban communities: The importance of green space and the social environment. *International journal of environmental research and public health*, *13*(4), 440.

Warwick-Booth, L. (2008). The role of social capital within regeneration; can building social capital benefit regeneration contexts? a review of the literature. *Social capital*, 35–52.

Watson, S. (2009). The magic of the marketplace: Sociality in a neglected public space. *Urban Studies*, 1577–1591.

Webster, C. (2007). Property rights, public space and urban design. *Town Planning Review*, 81–101.

Weedon, C. (2011). Identity, difference and social cohesion in contemporary britain. *Journal of Intercultural Studies*, *32*(3), 209–227.

Wells, P. (2018). Evidence based policy making in an age of austerity. *People, place and policy online*, *11*(3), 175–183.

Wessendorf, S. (2013). Commonplace diversity and the 'ethos of mixing': Perceptions of difference in a london neighbourhood. In *Identities: Global studies in culture and power* (pp. 407–422).

Westwood, A. (2011). Localism, social capital and the 'big society'. *Local Economy*, 690–701.

Wetherell, M. (2007). Community cohesion and identity dynamics: Dilemmas and challenges. In M. Wetherell, M. Lafleche, & R. Berkeley (Eds.), *Identity, ethnic diversity and community cohesion* (pp. 1–14). Sage.

White, J. T. (2015). Future directions in urban design as public policy: Reassessing best practice principles for design review and development management. *Journal of Urban Design*, 325–348.

Whitlock, J. (2007). The role of adults, public space, and power in adolescent community connectedness. *Journal of community psychology*, *35*(4), 499–518.

Whyte, W. H. (1980). *The social life of small urban spaces*. NY: Project for Public Spaces.

Wickes, R., Zahnow, R., Corcoran, J., & Hipp, J. R. (2019). Neighbourhood social conduits and resident social cohesion. *Urban Studies*, 226–248.

Winkel, G., Saegert, S., & Evans, G. W. (2009a). An ecological perspective on theory, methods, and analysis in environmental psychology: Advances and challenges. *Journal of Environmental Psychology*, *29*(3), 318–328. https://doi.org/10.1016/j.jenvp.2009.02.005

Winkel, G., Saegert, S., & Evans, G. W. (2009b). An ecological perspective on theory, methods, and analysis in environmental psychology: Advances and challenges. *Journal of Environmental Psychology*, *29*(3), 318–328.

Wise, A. (2011). 'foreign' signs and multicultural belongings on a diverse shopping street. *Built Environment*, 139–154.

Wolch, J. R., Byrne, J., & Newell, J. P. (2014). Urban green space, public health, and environmental justice: The challenge of making cities 'just green enough'. *Landscape and Urban Planning*, 234–244.

Woodcraft, S. (2015). Understanding and measuring social sustainability. *Journal of Urban Regeneration & Renewal*, 133–144.

Woolley, H. (2006). Freedom of the city: Contemporaryissues and policy influences onchildren and young people's use ofpublic open space in england. *Children's Geographies*, 45–59.

Worpole, K., & Knox, K. (2007). The social value of public spaces public. *Jesph Rowntree Foundation*, 1–15.

Worpole, K., & Knox, K. (2008). *The social value of public spaces*. Joseph Rowntree Foundation.

Wu, F. (2000). Modelling intrametropolitan location of foreign investment firms in a chinese city. *Urban Studies*, *37*(13), 2441–2464.

Wu, J. (1999). Hierarchy and scaling: Extrapolating information along a scaling ladder. *Canadian journal of remote sensing*, *25*(4), 367–380.

Wu, J. (2013). Landscape sustainability science: Ecosystem services and human well-being in changing landscapes. *Landscape ecology*, *28*(6), 999–1023.

Yassim, M. (2019). The wicked problem of social cohesion: Moving ahead. *Journal of Social Marketing*, 508–521.

Yu, . R., Wong, M., & Woo, J. (2019). Perceptions of neighborhood environment, sense of community, and self-rated health: An age-friendly city project in hong kong. *Journal of Urban Health*, 276–288.

Yu, . T., Sütz, B. S., & van Reeuwijk, M. (2023). Urban neighbourhood classification and multi-scale heterogeneity analysis of greater london. In *Environment and planning b: Urban analytics and city science* (pp. 1534–1558).

Zabetian, E., & Kheyroddin, R. (2019). Comparative evaluation of relationship between psychological adaptations in order to reach thermal comfort and sense of place in urban spaces. *Urban Climate*, 1–14.

Zamanifard, H., Alizadeh, T., & Bosman, C. (2018). Towards a framework of public space governance. *Cities*, 155–165.

Zamanifard, H., Alizadeh, T., Bosman, C., & Coiacetto, E. (2019). Measuring experiential qualities of urban public spaces: Users' perspective. *Journal of Urban Design*, *24*(3), 340–364.

Zeng, Y. (2023). The spaciality of public policy and urban space policy system from the perspective of sociology. *Advances in Applied Sociology*, 756–764.

Zerouati, W., & Bellal, T. (2019). Evaluating the impact of mass housings' in-between spaces' spatial configuration on users' social interaction. *Frontiers of architectural research*, 34–53.

Zhang, B., Song, Y., Liu, D., Zeng, Z., Guo, S., Yang, Q., Wen, Y., Wang, W., & Shen, X. (2023). Descriptive and network post-occupancy evaluation of the urban public space through social media: A case study of bryant park, ny. *Land*, *12*(7), 1403.

Zhang, W., & Lawson, G. (2009). Meeting and greeting: Activities in public outdoor spaces outside high-density urban residential communities. *Urban Design International*, 207–214.

Zhang, Y., & Dimitrijevic, B. (2025). Decoding socio-cultural spatial patterns in historic chinese neighborhoods: A pattern language approach from chengdu. *Land*, *14*(9), 1803.

Zhao, X., Lynch Jr, J. G., & Chen, Q. (2010). Reconsidering baron and kenny: Myths and truths about mediation analysis. *Journal of consumer research*, *37*(2), 197–206.

Zhu, Y. (2015). Toward community engagement: Can the built environment help? grassroots participation and communal space in chinese urban communities. *Habitat International*, 44–53.

Zhu, Y., & Fu, Q. (2017). Deciphering the civic virtue of communal space: Neighborhood attachment, social capital, and neighborhood participation in urban China. *Environment and Behavior*, 161–191.

Zordan, M., Talamini, G., & Villani, C. (2019). The association between ground floor features and public open space face-to-face interactions: Evidence from nantou village, shenzhen. *International Journal of Environmental Research and Public Health*, 1–19.

Zuur, A. F., Ieno, E. N., Walker, N. J., Saveliev, A. A., Smith, G. M., et al. (2009). *Mixed effects models and extensions in ecology with r* (Vol. 574). Springer.