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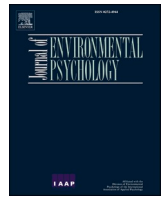
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Social interaction in public space: A meta-narrative review

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ABSTRACT

Understanding how people coordinate social interactions in public spaces is central to environmental psychology's study of human-environment relations, but research findings remain fragmented across disciplinary traditions with different epistemologies and vocabularies. This meta-narrative review synthesizes scholarship from ecological and environmental psychology, micro-interactional studies of public life, environment-behavior studies, and spatial justice and political recognition. We conducted iterative searches across Web of Science and Scopus (1908-2025), supplemented by forward-backward citation tracking; searching continued until new iterations introduced no new explanatory framework, citation lineage, or mode-relevant distinction. The final corpus comprises 119 key publications from 100 scholars that explicitly explore social interaction modes, types, or thresholds. Analysis reveals convergence on six recurring modes of public interaction: withdrawal, co-presence, co-attention, co-exchange, co-action, and assembly. The review compares how each tradition defines these modes and marks boundaries and shifts between them, preserving differences in explanatory approach. The framework provides a comparative vocabulary linking core concepts such as affordances, privacy regulation, joint attention, and attentional restoration to sociological, urban, and political accounts of public interaction. Analyzing spatial, normative, perceptual, and political conditions, the framework clarifies why similar spatial provisions can produce different interactional possibilities.

1. Introduction

Environmental psychology examines how physical settings shape behavior through human-environment relations, conceptualizing spatial arrangements as active constituents of psychological processes (Altman & Rogoff, 1987; Gifford, 2007; Stokols & Altman, 1987). Foundational research specifies how people regulate social interaction through interpersonal distance (Hall, 1966), privacy mechanisms (Altman, 1975), territorial marking, and crowding responses (Baum & Paulus, 1987), most clearly at the dyadic or small-group level. These frameworks explain how individuals manage accessibility, proximity, and arousal in relation to others. They do not, however, specify the forms through which multiple co-present strangers coordinate in shared public settings. No shared framework yet exists for describing and comparing those forms across the disciplines that study them.

Environmental properties shape where people linger, how they position themselves, what draws shared attention, and when coordinated action becomes feasible. Classic work demonstrates that physical-spatial arrangements organize activity patterns in behavior settings (Barker, 1968; Barker & Wright, 1955) and that design features structure

opportunities for contact (Gehl, 2011; Whyte, 1980). Recent work also shows that public-space experience depends in part on the ability to choose how to interact with others in the setting (Han et al., 2024; Lis et al., 2024). Related affordance-based design research also shows that architectural intention and adaptive user behavior do not align automatically, underscoring the need to distinguish spatial provision from the interactional forms that emerge in use (Mohammadi & Koutamanis, 2025). Yet much of this literature treats social interaction in broad terms, asking whether settings foster contact, sociability, or community, without showing which forms of coordination they support or where movement between them breaks down. This review addresses that gap by identifying recurring modes of public interaction as comparable descriptive units across disciplines.

1.1. Social interaction as a cross-disciplinary phenomenon

Social interaction is a situation of reciprocal influence in which each actor's behavior is reorganized by, and influences, the other's behavior (Turner, 1988, 2002). The literature relevant to this review can be distinguished, at a broad level, into two sets. One examines interaction

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as a socially organized process. The other examines the perceptual, ecological, and spatial conditions under which interaction becomes possible. This distinction matters because it separates perspectives that treat interaction as an accomplishment in its own right from those that focus on the conditions that enable or constrain it in shared settings.

Within the first set, microsociology examines ritual, face-work, and sequential organization, showing how social interactions become normatively accountable (Collins, 2004; Goffman, 1963; Lofland, 1998; Sacks et al., 1974). Related accounts trace how situations and others are typified (Mead, 1934) and how validity claims are negotiated in public discourse (Habermas, 1984). Social psychology has also classified interaction episodes and interpersonal situations, though its primary focus is interpersonal cognition rather than the spatial and organizational conditions of public coordination (Newcomb et al., 1965). Political theory extends this line by arguing that participation in public interaction is differentially authorized through recognition, rights, and entitlement to appear (Fraser, 1990; Young, 2000).

Within the second set, environmental psychology focuses on perception-action coupling, interpersonal affordances, distance regulation, and attentional organization (Altman, 1975; Gibson, 1979/1986; Hall, 1966; Patterson, 1982, 2014). Ecological psychology conceptualizes opportunities for engagement with others as social affordances, not only object-based ones (Valenti & Gold, 1991). Adjacent scholarship on settings and public-space use identifies spatial features, focal points, seating, permeability, and management conditions that scaffold observable interaction patterns (Barker, 1968; Gehl, 2011; Jacobs, 1961; Whyte, 1980). Recent bridging work (Horgan, 2019, 2020) links interaction-order concepts to affordance theory, showing that normative expectations and perception-action possibilities are jointly organized in public encounters.

These literatures illuminate different aspects of public interaction, but they do not yield a shared descriptive language. The same scene may be coded as an activity type, an involvement status, an affordance configuration, or a degree of publicness, depending on the tradition doing the analysis. Foundational work shows that people use spatial positioning, barriers, and distance regulation to manage accessibility and involvement, and that settings stabilize recurring patterns of conduct (Altman, 1975; Barker, 1968; Hall, 1966). Sommer's (1967) concept of sociofugal space further suggests that socio-material arrangements can stabilize low-demand public states. Yet this line of work has not been developed into a comparative account of how co-present strangers move between distinguishable coordination forms. In this article, modes of public interaction refer to recurring, publicly recognizable patterns through which co-present others organize their presence, attention, exchange, action, or collective assembly in shared space. The core person-environment question is not only whether socializing occurs, but which modes are organizationally possible, how they shift, and for whom.

Substantial bodies of research approach social interaction through their qualitative properties. They ask how encounters vary in duration, intensity, intimacy, and involvement (Argyle, 1969/2017; Patterson, 1982; Patterson & Edinger, 2014). They also examine how repeated contact can generate familiarity without necessarily developing into stronger ties (Milgram, 1972; Zahnow & Corcoran, 2025). Other work considers what such encounters produce socially, in terms of belonging, coexistence, neighborhood attachment, and public comfort (Neal et al., 2015; Valentine, 2008; Watson, 2006, 2009). These qualities are not evenly distributed. Status, surveillance, and power relations shape who initiates, who responds, and who can withdraw without notice (Anderson, 2011; Berger et al., 1972; Browne, 2015; Sharon & Koops, 2021). These are analytically important questions, but they concern variation within encounters once some form of interactional coordination is already in place. This review focuses on an earlier question: which recurrent patterns of public coordination hold, shift, or break down, and under what conditions?

1.2. The integration challenge in public interaction research

Recent work on public settings has exposed limitations in how social interaction is studied. Many observation protocols for parks and open spaces quantify physical activity and participant counts. SOPARC, for example, was designed to code park users and activity levels, not the organization of interaction among co-present people (McKenzie et al., 2006). As a result, social interaction is often captured indirectly through self-reports of contact or attachment, or through broader social outcomes such as social ties and neighborhood life (Maas et al., 2009). Other environmental-psychology work links urban mobility and public-space use to orientations toward the common good, but again without differentiating the coordination forms through which such orientations are organized or enacted (Schuster et al., 2023). Reviews of environmental psychology research have also tended to organize findings by setting type, not interactional forms (Giuliani & Scopelliti, 2009). This leaves a gap between evidence that settings matter and finer-grained accounts of how public interaction is organized.

Existing integrative frameworks are useful but do not resolve this problem. Building on Patten's (1932) participation categories, Chen et al. (2023) distinguish solitary presence, parallel co-presence, shared attention, and direct engagement in urban outdoor settings. This is an important advance, especially within environmental psychology. Yet these categories remain difficult to translate across literature because some are activity-based, others process-based, and others defined by interactional meaning or threshold (Hadley et al., 2022). Related work in urban studies and design often treats interaction as an outcome, whether framed through social infrastructure, encounter and belonging, or public-space quality (Amin, 2008; Carmona, 2019; Mehta, 2019; Tonkiss, 2005, 2014; Watson, 2006, 2009). Each is valuable, but none offers a shared way to compare how public interaction is organized across different bodies of scholarship. Research on hybrid public spaces makes a similar point. Public life cannot be understood through ownership or spatial provision alone, since access, use, exclusion, and public experience are shaped together through design, management, and wider conditions of authorization (Mohammadi et al., 2021; Mohammadi & Stevens, 2025).

Three gaps persist in the person-environment literature. First, no framework systematically compares how different disciplines define recurring modes of public coordination and the thresholds between them. Second, contextual models that analytically separate physical, social, and economic dimensions of settings (Winkel et al., 2009) have not been applied to specify how these dimensions jointly enable or constrain particular modes of public interaction. Third, the absence of such a framework helps explain why well-designed spaces may show increased occupancy without corresponding gains in interactional diversity. Here interactional diversity refers to the range of modes a setting reliably supports, not the demographic diversity of its users (Hampton et al., 2015).

1.3. Research questions and contributions

This review addresses two questions. First, what recurring modes of social interaction are distinguished across the literature that study public space? Second, how do the four research traditions describe the thresholds and enabling conditions for those modes, and how do their vocabularies, evidentiary standards, and analytic units differ in doing so?

Through a meta-narrative review of 119 publications across four research traditions identified by iterative searching, citation tracing, and conceptual mapping, this article develops a framework for modes of social interaction in public space. Meta-narrative review is appropriate where a topic has been conceptualized and studied across bodies of scholarship with distinct assumptions, methods, and standards of evidence (Greenhalgh et al., 2005; Wong et al., 2013). The review identifies six recurring modes: withdrawal, co-presence, co-attention,

co-exchange, co-action, and assembly. It compares how the four traditions describe their thresholds and enabling conditions. The framework contributes by identifying recurring modes across traditions, specifying the spatial, normative, perceptual, and political conditions that shape them, and providing shared descriptive units for cumulative analysis of public coordination.

2. Research methodology

This study used meta-narrative review because research on social interaction in public space spans heterogeneous literatures that do not share common vocabulary, theory, method, or evidentiary standard. The review reconstructed and compared research traditions rather than aggregating findings as if they came from a single cumulative field. In what follows, discipline refers to established academic fields such as psychology, sociology, geography, planning, architecture, communication, and political theory. Research traditions refer to the four analytic groupings developed through the review. Paradigm is used in the broader meta-narrative sense to describe differences in assumptions, vocabulary, methods, and standards of evidence (Greenhalgh et al., 2005; Wong et al., 2013).

The review was conducted in line with the core principles of meta-narrative synthesis, including pluralism, historicity, contestation, reflexivity, and peer review (Gough, 2013; Greenhalgh et al., 2011; Kim et al., 2021) (see Table 1). Each tradition was first reconstructed on its own terms before cross-tradition comparison began. The synthesis proceeded abductively rather than from a pre-given taxonomy (Timmermans & Tavory, 2012). It moved iteratively between the corpus and an emerging analytical map, asking which configuration of research traditions best accounted for recurring distinctions in public interaction without collapsing meaningful differences between them. A decision log tracked inclusion decisions, tradition assignments, boundary cases, and equivalence claims throughout. The final corpus comprised 119 key works spanning four research traditions (Table 2).

2.1. Search process and selection criteria

Initial scoping, database searching, and citation tracing were conducted iteratively rather than as a single linear search. Web of Science and Scopus were used as the principal databases, supplemented by Google Scholar and forward-backward citation tracing. Search terms and inclusion criteria were refined as the review progressed and key citation lineages and conceptual boundaries became clearer. Because the topic is dispersed across disciplines and indexed under different vocabularies, the aim was not exhaustive retrieval but systematic identification of the principal research traditions through which public interaction has been conceptualized and studied.

Two primary reviewers screened the corpus against the inclusion criteria. Potentially relevant texts were assessed first through title and abstract review and then through full-text reading where required. Anchor works were treated as the primary unit of extraction, while additional texts were consulted where necessary to establish citation lineage, clarify conceptual development, or resolve uncertain tradition placement. Difficult inclusion and boundary cases were discussed between the two primary reviewers, with further team discussion among three authors, where a decision had implications for the emerging tradition map.

Searching stopped when additional iterations yielded further material within already-identified traditions but introduced no new explanatory framework, citation lineage, or mode-relevant distinction (Kim et al., 2021). Four criteria guided inclusion.

- explicit engagement with modes, forms, types, levels, stages, or thresholds of social interaction in public space;
- theoretical significance within at least one research tradition, such as foundational formulations, major syntheses, or influential critiques;

Table 1
Six-phase meta-narrative review implementation.

Phase	Key Activities	Specific Methods	Outputs
1. Planning	Research framework development	Research tradition identification protocols, citation-lineage criteria	Research questions, inclusion criteria
2. Search	Iterative corpus development	Citation tracking (1908-2025), database searches	Final analytic corpus: 119 key works
3. Mapping	Research tradition identification and validation	Intellectual genealogy tracing, comparative conceptual scaffold	Four research traditions validated and bridging texts identified
4. Appraisal	Quality assessment and data extraction	Tradition-specific criteria, structured extraction fields	Scholar profiles, theoretical contributions
5. Synthesis	Cross-tradition analysis	Convergence identification, tension preservation	Framework development
6. Recommendations	Framework application	Framework implications, future research directions	The framework's comparative value

Table 2
Anchor works and authors included in the meta-narrative corpus, by tradition.

Tradition	Scholars
Ecological and environmental psychology	Altman (1975); Altman and Rogoff (1987); Argyle (1969/2017); Baggs (2021); Barker (1968); Barker and Wright (1955); Baum and Paulus (1987); Clark (1996, 2020); Costall (1995); De Jaegher et al. (2010); Di Masso (2012); Gallagher (2020); Gibson (1986); Hall (1966); Heft (2001, 2007, 2025); Kaplan and Kaplan (1989); Krueger (2011); McGann and De Jaegher (2009); Meagher (2020); Patterson (1982); Parten (1932); Rietveld and Kiverstein (2014); Sommer (1967); Tomasello (2009); Valenti and Gold (1991)
Micro-interactional	Arminen and Heino (2023); Baldor (2022); Baym and boyd (2012); Berger et al. (1972); Collins (2004); De Stefani and Mondada (2018); e Silva and Frith (2012); Fine (2010, 2012); Goffman (1959, 1961, 1963, 1971); Goodwin (2018); Haddington et al. (2012); Hampton et al. (2015); Hampton and Gupta (2008); Heritage (1984); Horgan (2019, 2020); Kendon (1990); Lofland (1973, 1998); Mead (1934); Milgram (1972); Mondada (2009, 2014); Mondada et al. (2020); Simmel (1908/1950); Smith (2011); Sutko and e Silva (2011); Swanson (1965); Turner (1988, 2002); Wirth (1938)
Environment-behavior	Aelbrecht and Stevens (2023); Bjerkeset (2025); Carmona (2015, 2019); Carr (2020); Carr et al. (1992); Cattell et al. (2008); Chen et al. (2023); Gehl (1971, 2011); Gehl and Svarre (2013); Heu and Brennecke (2023); Jacobs (1961); Legeby (2013); Loo and Fan (2023); Maas et al. (2009); Marcus and Francis (1998); Mehta (2013, 2019); Mehta and Bosson (2021); Oldenburg (1999); Peters (2010); Steier et al. (2015); Stevens (2007); Talen (1999); Tonkiss (2005, 2014); Whyte (1980); Widmer (2023, 2025); Williams (2005)
Spatial justice/recognition	Amin (2008); Anderson (2011); Arendt (1958); Blomley (2010); Butler (2015); Fraser (1990); Browne (2015); Landis (1935); Langegger and Koester (2016); Lefebvre (1991); Low and Smith (2006); Liu et al. (2025); Middleton (2018); Mitchell (2003); Neal et al. (2015, 2019); Robinson et al. (2024); Sennett (2018); Sharon and Koops (2021); Watson (2006); Young (2000); Zahnow and Corcoran (2025); Zukin (2012); Valentine (2008)

Placement of scholars' work into traditions reflects the dominant explanatory claim of the specific cited work, not the scholar's overall intellectual identity. Works whose arguments are also cited across identified tradition boundaries are discussed in Section 4 as bridging literature.

- landmark influence in introducing, consolidating, or revising a conceptualization relevant to the review questions;
- location within, or substantive bridging across, the research traditions identified during the mapping phase.

The resulting corpus combines foundational texts with contemporary contributions and preserves both divergence and overlap in how public interaction has been conceptualized. Table 2 lists the anchor works included in the final corpus.

2.2. Research tradition identification and validation

The four research traditions are analytic groupings rather than discrete fields or scholars' own self-descriptions. The primary assignment criterion was explanatory focus, understood as what each text treated as the main condition through which public interaction becomes possible, organized, or constrained. Citation lineage and methodological coherence provided additional support for each placement. On this basis, the review identified four principal traditions: ecological and environmental psychology, micro-interactional studies of public life,

environment-behavior studies, and spatial justice and political recognition. These are not offered as an exhaustive typology, but as the main research lineages visible through this review's questions and search strategy. A tradition was retained when it combined a recognizable explanatory premise, a traceable citation lineage, and sufficient methodological coherence to sustain a distinct research storyline. The traditions are not historically separate; some share foundational influences but develop them in different explanatory directions. Historicity was addressed by tracing foundational works, later refinements, and internal debates within each tradition.

Some concepts travel across traditions. Goffman's civil inattention can be treated as a perceptual-regulatory resource in ecological accounts and as a normatively accountable practice in micro-interactional ones. Hall's distance zones can function as perceptual thresholds in one tradition and as interactional markers in another. Kendon's F-formations can serve either as observational categories or as participation frameworks. Such overlap does not erase the distinction between traditions, because the same concept supports different questions, evidence standards, and explanations. In Table 2, primary placement follows the dominant explanatory claim of the cited work rather than the scholar's overall intellectual identity. Social psychology's person-perception literature is not presented as a separate tradition here, since its main analytic focus is the perceiver's inference. The present review, by contrast, centers on the organizational form of the encounter. Recent work linking person perception to racialized space (Bonam et al., 2017; James et al., 2023; Williams et al., 2016) connects it to the spatial justice tradition included here and points to a useful direction for future integration.

2.3. Review process, appraisal, and synthesis

The review proceeded iteratively. Initial scoping, searching, and first-round mapping were led by the first author with a second primary reviewer. Inclusion criteria, tradition boundaries, and difficult cases were discussed between the two primary reviewers throughout, with wider author-team discussion when decisions affected the developing tradition map. Because tradition assignment in meta-narrative review involves interpretive judgment, the review did not use formal inter-rater reliability statistics (Gough, 2013; Wong et al., 2013). Disagreements were resolved against the stated criteria of explanatory focus, citation lineage, and methodological coherence. Cases that remained genuinely cross-traditional were retained as bridging contributions and recorded in the decision log.

Appraisal followed the credibility standards internal to each tradition. No single universal evidence hierarchy was imposed. Publications were assessed for relevance and credibility within the standards of the tradition in which they operated. Data extraction focused on problem definition, key concepts, explanatory assumptions, methodological orientation, landmark contributions, and the text's role in distinguishing interactional modes or thresholds.

Analysis then proceeded in two stages. First, each tradition was reconstructed narratively to identify its key concepts, major lineages, and internal debates. Second, the traditions were compared across the review questions to identify recurring interactional distinctions and differences in thresholds between them. The six modes presented later emerged through repeated comparison of how traditions distinguished public interactional states and where those distinctions aligned, diverged, or only partially overlapped. This procedure allowed the review to develop a comparative vocabulary while preserving substantive differences between traditions.

3. Four research traditions

The literature on social interaction in public space did not develop as a single cumulative field. It emerged through four research traditions that approached the same broad phenomenon with different

explanatory priorities, conceptual vocabularies, and standards of evidence. What follows reconstructs those traditions on their own terms before bringing them into comparison in Section 4.

3.1. Ecological and environmental psychology

For ecological and environmental psychology, the key question is how social coordination becomes perceptually available in a populated environment. Environments offer affordances as action possibilities relative to an organism's capacities. Gibson's (1979/1986, p. 135) claim that "the richest and most elaborate affordances of the environment are provided by other people" established the decisive move; the environment is not merely a physical surround, but a populated field of socially charged possibilities. To perceive a setting is, in part, to perceive what it makes possible in relation to others who are already there.

From that starting point, the tradition developed along two related trajectories. One runs through ecological psychology and Barker's account of behavior settings as temporally and spatially bounded units that organize recurring participation formats through programs of action (Barker, 1968; Barker & Wright, 1955). Recent work argues that social psychology's historical neglect of the physical environment makes behavior settings and affordances necessary for any adequate account of socially embedded action (Meagher, 2020). The other runs through environmental psychology's work on interpersonal regulation. Hall's (1966) proxemics and Altman's (1975) privacy regulation theory show how people calibrate distance, shielding, and withdrawal to manage accessibility without necessarily exiting the setting. In this line of work, distance zones are not simply measurements of proximity; they are practical thresholds in involvement, attention, and interpersonal availability. Patterson (1982, 2014) extends this logic by showing how nonverbal conduct organizes information exchange, intimacy, service, and control through patterned shifts in gaze, posture, and spacing.

Later developments extend and refine these insights. Enactive and extended accounts recast face-to-face coordination as the active management of a shared interpersonal space sustained through expressive action, bodily orientation, and joint attention (De Jaegher et al., 2010; Krueger, 2011). Attention restoration theory adds an important further claim that low-demand environments do not merely reduce stimulation, but they can actively sustain withdrawal and minimal co-presence as legitimate and restorative public states (Kaplan, 1995; Kaplan & Kaplan, 1989). Across these developments, the tradition consistently treats public interaction in terms of perceptual availability, attentional organization, and the regulation of accessibility in populated environments. Its main value for this review lies in making the perceptual infrastructure of public interaction visible. This includes how availability is sensed, how attention is directed or withheld, and how settings become readable as inviting approach, orientation, participation, or retreat.

The overlap with the micro-interactional tradition is real, especially around Goffman's concepts of civil inattention and involvement shields, and Altman drew on Goffman explicitly. But the overlap does not dissolve the distinction. In ecological and environmental psychology, shielding and distance calibration are treated primarily as perceptual-regulatory mechanisms through which availability is managed in relation to arousal, attention, and spatial positioning. In the micro-interactional tradition, the same phenomena are treated as normatively accountable practices through which interaction order is achieved and repaired. The concepts travel, but they do different explanatory work. For all its strengths, this tradition usually leaves normativity and power in the background, although work on place attachment and the politics of public space begins to bring them more directly into view (Di Masso, 2012).

3.2. Micro-interactional studies of public life

Micro-interactional studies begin with a different problem, questioning how public interaction is achieved as an accountable

accomplishment. Its central premise is that co-presence among strangers is not a default condition but an organized achievement. Even minimal conduct in public depends on practical expectations about attention, distance, acknowledgment, and the management of involvement.

This tradition begins with urban sociology's early insight that reserve, distance, and limited regard are integral to city life and should be understood as practical social conditions (Simmel, 1908/1950; Wirth, 1938). Goffman (1963, 1971) gave this line of thought its canonical form in the concept of the interaction order. His distinction between focused and unfocused interaction, together with his account of civil inattention, made anonymity, acknowledgment, and involvement available for analysis as publicly organized practices. Just as importantly, dramaturgical distinctions between front and backstage conduct show how people manage accessibility and exposure in public situations. Involvement shields formalize the small objects and embodied displays through which withdrawal within co-presence becomes interactionally legible.

The ethnomethodological and conversation-analytic extensions of this tradition sharpened that claim. Heritage (1984) makes this premise explicit. Social order, in this view, is produced in situ as a practical accomplishment rather than imported ready-made from outside the encounter. From there, sequential organization becomes central to explanation (Sacks et al., 1974). Kendon's (1990) F-formations show that bodily arrangements encode readiness, inclusion, and withdrawal before speech begins. Later multimodal work demonstrates that gaze, posture, trajectories, and material configurations organize participation in mobile and distributed encounters (De Stefani & Mondada, 2018; Goodwin, 2018; Mondada, 2009, 2014). Horgan (2019, 2020) extends the tradition by showing that civil inattention is not just routine but moralized, so that infractions of attention can themselves become normatively accountable as uncivil.

Its strongest contribution to the present review is an account of the interactional work through which modes are produced, maintained, and shifted. It shows how co-presence remains unfocused, how openings are initiated or refused, how focused encounters are assembled, and how breakdowns are repaired through publicly accountable sequences. Its preferred evidence is not simple co-occurrence or spatial correlation, but what participants can be shown to orient to together in the unfolding situation.

The difference from the ecological tradition is not the absence of shared concepts but the difference in explanatory commitment. Here, civil inattention and involvement shields are normatively accountable practices through which interaction order is achieved, sanctioned, and repaired. In ecological and environmental psychology, related phenomena are treated as mechanisms of accessibility and arousal regulation. The units of analysis, the standards of evidence, and the account of what makes interaction possible are distinct. At the same time, this tradition tends to under-specify the perceptual salience, spatial configuration, and formal authorization under which its normative procedures can operate, precisely the conditions the other three traditions bring into sharper view.

3.3. Environment-behavior studies

Environment-behavior research treats public interaction as an observable pattern linked to built form, management, and programming. Its central concern is how spatial conditions shape visible outcomes. The tradition's storyline is empirical and observational from the outset. Jacobs (1961) argued from street-level evidence that the texture of sidewalk contact depends on the spatial arrangement of buildings, uses, and pedestrian flows. Whyte (1980) gave this approach methodological precision through systematic observation, showing that specific micro-features reliably generate social activity. He identifies triangulation as the process through which a shared stimulus shifts dispersed individuals from parallel presence into common orientation. Stevens (2007) extends this logic by showing how playful, weakly programmed

environments can catalyze movement from passing to pausing and joining. Gehl (2011) then consolidates the design-operational vocabulary through his distinction between necessary, optional, and social activities, linking comfort, amenity, and protection to visible patterns of sociability.

Further conceptual refinement comes with Mehta's (2013, 2019) distinctions among passive, fleeting, and enduring sociability. These categories are especially important for this review because they provide empirical markers for thresholds that map closely onto the distinctions between co-presence, co-exchange, and co-action. Tonkiss (2005, 2014) adds the useful formulation of "rubbing along," which captures calibrated co-presence that neither demands engagement nor excludes it and establishes minimal sociability as an analytic object in its own right.

For the present review, this tradition is most useful in diagnostic and practice-facing terms. It generates observable, countable categories that can be linked to spatial features, management strategies, and patterns of use. Empirical work on public spaces shows that social life depends not only on spatial provision but also on management conditions, permeability, and amenities that shape whether people linger, observe, or interact (Mohammadi, 2021; Mohammadi & Stevens, 2024; Widmer, 2023). That makes it especially important for translating abstract distinctions into empirically traceable public-space patterns. Its boundary with ecological and environmental psychology lies in its principal analytic move. Its central question is how spatial provisions shape observed interaction frequencies and distributions. Its boundary with spatial justice work is equally important. Environment-behavior studies may acknowledge exclusion, uneven access, or management bias, but their primary explanatory interest remains the spatial organization of observable activity. Political authorization usually remains in the background, instead of becoming a central analytic focus. Activity counts alone cannot show when contact is meaningful, safe, or equally available.

3.4. Spatial justice and political recognition

Spatial justice and political recognition scholarship shifts the problem to authorization by asking who may appear, linger, and assemble in public, on what terms, and at what risk. These capacities are not behavioral givens; they are politically structured through law, ownership, policing, and differential recognition. The tradition treats conditions of access to public space as a primary object of explanation.

Its lineage begins with philosophical accounts of publicness as constitutive of democratic life. Arendt (1958) made appearance among others central to political existence itself, while Habermas (1989/1989, 1984) theorized the communicative and institutional conditions under which claims become public. Lefebvre (1991) then transformed the question by showing that space is not a passive container for public life but a socially and politically produced condition of possibility for it. Feminist and radical democratic critiques pushed this further. Fraser (1990) showed that access to discourse and public visibility is differentially authorized, while Young (2000) showed that dominant publics routinely cast some bodies as out of place. A later turn centered on assembly and vulnerability. Butler (2015) and Mitchell (2003) demonstrate that collective presence is always conditioned by uneven legal protection and policing, so that even the capacity to gather and endure in space is differentially distributed.

Recent work extends these arguments into ordinary public life. Low-intensity co-presence, routine visibility, and everyday sharing of space can be politically consequential precisely because they are unevenly protected and differentially risky (Anderson, 2011; Browne, 2015; Watson, 2006). Research on person perception further shows that racialized space shapes how behavior is interpreted. The same presence or movement may be read differently depending on whose body occupies which setting (Bonam et al., 2017; James et al., 2023; Williams et al., 2016). Sharon and Koops (2021) sharpen this insight by showing how pervasive sensing and facial recognition undermine civil inattention as a

privacy-protecting mechanism, making disattendability more difficult for some bodies than for others. Its distinctive contribution is to explain why access to interaction modes is unevenly distributed. Who can initiate, withdraw without sanction, or assemble legitimately depends on race, class, gender, legal status, and surveillance. Thresholds of publicness and authorization are the primary analytic objects, not local encounter mechanics.

The overlaps with other traditions are again real but not flattening. Civil inattention is shared with the micro-interactional tradition, but here it appears as an unevenly distributed capacity to remain civilly disattendable. Lefebvre is also taken up in environment-behavior scholarship, but here the production of space is framed chiefly as a site of contestation. The primary explanatory unit is authorization and differential legitimacy, not the sequential mechanics of how ordinary encounters unfold. The limitation that follows is equally clear: by foregrounding contestation and access, this tradition can leave underdeveloped the perceptual and sequential mechanisms through which ordinary encounters begin, stabilize, and shift. Section 4 examines where they diverge and where, despite those differences, they converge.

4. Comparative analysis

This section examines how the four traditions conceptualize change in interaction. The analysis reveals a paradoxical pattern in which traditions with different theoretical and methodological foundations repeatedly converge on recognizably similar coordination patterns. We compare how each tradition names shifts, what counts as evidence for them, and how it explains them. Descriptions are functionally equivalent when they: (1) mark comparable shifts in interactional state, (2) require similar coordination, and (3) point to recognizably similar scenes. Functional equivalence is used here as an analytic device. It enables comparison without claiming theoretical agreement about what drives the patterns.

4.1. Divergence

The traditions diverge in three ways that matter for evidence and explanation. These concern explanatory priority, the analytic units through which interaction is differentiated, and the way change is modeled. First, they differ in explanatory priority. Environment-behavior research analyzes built form and management as conditions altering observable sociability. Micro-interactional research prioritizes accountability and sequential organization as mechanisms through which interaction is produced and sustained. Ecological and environmental psychology sets out perceptual availability and regulation as preconditions for coordination. Spatial justice and political recognition foreground authorization, exposure, and governance of presence.

Second, traditions employ different analytic units. Ecological and environmental psychology differentiates interaction through distance, trajectories, attentional states, and boundary regulation (Hall, 1966; Patterson & Edinger, 2014). Micro-interactional research differentiates through involvement statuses, participation formats, and sequential procedures that establish recognizable encounter types (Goffman, 1963; Kendon, 1990; Mondada, 2014, 2018). Environment-behavior research differentiates through activity and sociability categories designed to be observed, counted, and compared (Cattell et al., 2008; Gehl, 2011; Mehta, 2013; Mehta & Bosson, 2021; Whyte, 1980). Spatial justice and political recognition differentiate forms of publicness through thresholds and modalities of appearance, including the conditions under which presence is recognized as legitimate or removable (Fraser, 1990; Mitchell, 2003; Young, 2000). The same scene can be analyzed as an affordance configuration, an involvement status, an activity category, or a publicness threshold. Each analytic unit highlights a different dimension of interaction.

Third, the traditions diverge in how they model change. Environment-behavior and many perceptual accounts describe change

as gradational, where spatial and situational conditions raise or lower the probability of shifts toward more engaged encounters (Gehl, 2011; Stevens, 2007). Micro-interactive and political accounts often conceptualize change as threshold crossings that reconfigure rights and obligations, such as the shift from unfocused to focused participation or from co-location to public claim-making (Butler, 2015; Collins, 2004; Goffman, 1963). These change models imply different evaluative baselines, including whether minimal co-presence is interpreted as unrealized potential or substantive public accomplishments. Gradational accounts tend to evaluate settings by whether they realize higher-intensity interaction, while threshold accounts frame stable co-presence as a sufficient accomplishment (Tonkiss, 2005).

Environment-behavior studies often pursue post-positivist regularities linking spatial conditions to observable patterns of sociability, whereas spatial justice approaches draw on constructivist and critical accounts of how presence is authorized and contested. Micro-interactive work combines close observation with analysis of participants' displayed orientations and accountable meaning, while ecological and environmental psychology examines perception-action coupling and regulatory processes, including experimental approaches to causal mechanisms. Recent scholarship increasingly bridges these distinctions by treating public interaction as simultaneously perceptual, sequential, spatial, and politically conditioned. In environmental psychology, political dimensions of place reframe interaction as a question of emplaced entitlement and inclusion (Di Masso, 2012). In micro-interactive research, embodied practices make spatial arrangements and movement integral to participation (Goodwin, 2018; Mondada, 2014). In environment-behavior scholarship, assessments of sociability increasingly incorporate differential access and exclusion, treating uneven ability to initiate or sustain interaction as part of the phenomenon being explained (Aelbrecht & Stevens, 2023; see Table 3).

4.2. Convergent coordination patterns

Following the coding procedure described above, meta-narrative comparison indicates that accounts across traditions cluster around six recurrent coordination patterns. Although authors use different vocabularies (activity types, involvement statuses, perceptual states, and publicness categories), they mark comparable transitions.

Protected non-engagement: The capacity to remain present while declining engagement is supported by refuges and spatial positions permitting presence without invitation (Carr et al., 1992), civil inattention and involvement shields making non-engagement legible (Goffman, 1963, 1971), and accessibility regulation (Altman, 1975; Kaplan & Kaplan, 1989). This capacity is unevenly distributed under surveillance and racialized suspicion (Anderson, 2011; Browne, 2015).

Sharing space with minimal acknowledgment: Calibrated co-occupation involves passive contact and low-threshold sharing of space as routine conditions of public life (Gehl, 2011; Whyte, 1980). Glances, body angles, and monitoring maintain boundaries without escalating demands (Goffman, 1963; Lofland, 1998). Interpersonal distance regulates arousal and availability (Hall, 1966). Political theory frames co-presence as a democratic minimum (Young, 2000). Repeated

non-verbal recognition can generate belonging without exchange (Legeby, 2013; Milgram, 1972).

Coordinated attention without direct exchange: Traditions mark shifts from parallel occupation to loosely shared focus. Triangulation shows how an external cue draws dispersed individuals into common orbits (Stevens, 2007; Whyte, 1980). Trajectories and formations organize shared orientation around a common center (Kendon, 1990; Mondada, 2009). Joint attention and shared reference are stabilized by material anchors (Clark, 2020; Tomasello, 2009).

Reciprocal interaction and exchange: Low-commitment exchange tests availability and trust. Third places and encounter-supporting micro-settings provide conditions under which openings become plausible (Oldenburg, 1999; Whyte, 1980). Opening sequences and repair practices manage risks of initiation (Goffman, 1963; Mondada, 2014). Common-ground accounts clarify how mutual knowledge is built in interaction (Clark, 1996). Status, language, and surveillance shape who can initiate and whose openings are identified as legitimate (Anderson, 2011; Berger et al., 1972).

Collaborative action: Sustained joint action is distinguished by shared intentionality and mutual understanding (Gallagher, 2020; Krueger, 2011; Tomasello, 2009). Environment-behavior research points to task-ready layouts that scaffold coordination (Gehl, 2011; Mehta, 2013). Participation management includes entry, role allocation, and exit (Goffman, 1963). Repeated collaboration can sediment shared practices and trust (Fine, 2012). Collaboration often requires protection from disruption, particularly where cooperation is publicly visible (Butler, 2015).

Large-scale collective gathering: This is a qualitatively distinct configuration. Political theories conceptualize assembly as collective appearance, endurance, and claims-making under uneven protection (Butler, 2015; Mitchell, 2003). Interaction ritual theory adds collective rhythm and mutual focus in sustaining crowd coherence (Collins, 2004). Design research specifies spatial capacity, access, and conditions for dense co-presence (Carmona, 2019; Carr et al., 1992).

Across traditions, these six patterns are understood as dynamically related configurations whose boundaries and transitions matter analytically. Movement between them depends on organizational work, including openings, boundary negotiation, and protection from disruption, even where accounts are not explicitly sequential. The convergence claim rests on functional recurrence across traditions that differ in their standards of evidence. Environment-behavior research emphasizes spatial conditions, micro-interactive work specifies coordination work, ecological psychology foregrounds perceptual-attentional coupling, and spatial justice highlights authorization and protection. These recurrent patterns provide the basis for the framework developed in Section 5.

5. An integrated analytical framework

This section formalizes the six recurrent patterns as interaction modes. The framework identifies recurring organizational patterns across traditions while leaving disagreement about causal mechanisms intact. We analyze each mode across four dimensions: spatial

Table 3
Cross-tradition divergence in explanatory priorities, analytic units, and evidence.

Comparative focus	Ecological & environmental psychology	Micro-interactive	Environment-behavior	Spatial justice & political recognition
Primary explanatory focus	Perceptual availability/regulation; perception-action coupling; affordances	Sequential accountability; interaction order	Spatial configuration & management as conditions shaping sociability	Authorization; exposure/vulnerability; recognition/power
Typical analytic unit	Attention/distance states; interaction episode	Encounter; participation framework	Setting; activity/sociability categories	Publicness threshold; appearance/assembly
Evidence	Ecological validity; conceptual coherence/mechanism plausibility	Sequential adequacy; fine-grain organization	Observation/mapping; pattern association	Normative coherence; regulatory/institutional conditions

arrangements, normative organization, perceptual processes, and political authorization.

Across traditions, authors mark threshold crossings between modes and stabilization requirements for each mode. For example, co-exchange may be civil (brief greetings, helpful talk) or hostile (harassment, threats) without changing its organizational form. Assembly may be peaceful or violent. Evaluative judgments require additional criteria beyond mode identification. This keeps what is happening distinct from how it is experienced or judged.

- **Withdrawal** is maintained public presence under reduced engagement obligations. The term denotes present non-engagement rather than absence from the setting. It is sustained by spatial refuges allowing retreat without exit (Carr et al., 1992), normative signals deflecting attention claims (Goffman, 1963), and low-demand monitoring that enables attentional recovery (Kaplan & Kaplan, 1989). Withdrawal also requires protection from forced visibility and suspicion (Anderson, 2011; Browne, 2015).
- **Co-presence** is the mutually perceptible sharing of a public setting with calibrated distance and minimal acknowledgment. It begins when participants enter a practical range of mutual registration, such that others can be seen, heard, or otherwise noticed. Co-presence rests on spatial conditions supporting circulation and mutual visibility (Gehl, 2011; Whyte, 1980), normative protocols for managing anonymous proximity (Goffman, 1963; Lofland, 1998), and perceptual distance regulation (Hall, 1966). It also presumes political recognition of presence as a legitimate right (Arendt, 1958). This is consistent with accounts of space as communicatively accomplished through embodied position, mutual perceptibility, and deictic orientation, not given by physical proximity alone (Hausendorf, 2013). Milgram's "familiar stranger" shows how repeated co-presence can generate recognition without talk, producing public familiarity without demanding ties (Milgram, 1972). Co-presence sustains public order and toleration without intimacy, affiliation, or agreement. Across traditions, co-presence is identified by a stable organization of proximity and mutual monitoring that neither obliges interaction nor precludes it.
- **Co-attention** is orienting toward a common stimulus while weakly engaged with one another. It is catalyzed by spatial attractors that draw dispersed individuals into a shared field of orientation (Stevens, 2007; Whyte, 1980). Perceptual accounts specify mechanisms of shared reference and joint attention (Clark, 1996; Tomasello, 2009). Micro-interactional work shows how shared focus becomes publicly recognizable through embodied and sequential adjustments, including deceleration, gaze checks, and formation work (Kendon, 1990; Mondada, 2009). Co-attention is anchored in an event, object, or incident and often dissolves without developing into talk or collaboration. The defining transition is from parallel occupation to a publicly legible shared orientation.
- **Co-exchange** is a reciprocal interaction in which one participant's act normatively calls for uptake by another, through greeting, brief talk, a question-response sequence, or comparable accountable reply. It is typically low-commitment and does not require shared goals. Settings legitimating low-stakes contact and spatial positioning enabling openings are preconditions (Oldenburg, 1999). Normative opening and repair sequences manage entry, risk, and exit (Mondada, 2014). Exchange becomes fragile where lingering or informal contact is criminalized, or where openings expose groups to sanction. The diagnostic transition is from shared orientation to reciprocal address.
- **Co-action** is sustained joint action organized through shared intentionality, task alignment, role allocation, and mutual adjustment around a common practical activity. It requires spatial layouts supporting joint activity (Gehl, 2011; Mehta & Bosson, 2021), normative practices managing participation and accountability (Goffman, 1963; Goodwin, 2018), and cognitive coordination of attention to a

common project (Krueger, 2011; Tomasello, 2009). Co-action is more boundary-sensitive than co-exchange because task alignment requires clearer participation conditions. It is marked by an established joint project, including division of roles, sequencing, shared objects, or an explicit plan.

- **Assembly** involves large-scale gatherings enacting collective presence through sustained coordination. It requires spatial capacity, access, and crowd legibility (Carr et al., 1992), normative permissions supporting duration and collective rhythm (Collins, 2004), and crowd awareness sustaining coherence. Political conditions are decisive as assembly is enabled or pre-empted through legality, policing, and vulnerability (Butler, 2015; Mitchell, 2003). Assembly differs from co-action in scale, as coordination is organized at the crowd level and oriented to a collectively visible presence.

The non-reciprocal modes (withdrawal, co-presence, co-attention) organize presence, proximity, and shared attention without generating an obligation of reciprocal address toward a specific other. They support individual autonomy, restorative functions, and the perceptual and normative infrastructure on which all public interaction depends. The reciprocal modes (co-exchange, co-action, assembly) involve direct address, collaborative coordination, or collective organization in which participants' acts call for accountable responses, whether from a single interlocutor, a task partner, or a crowd. These groupings are not hierarchical. A setting that reliably supports withdrawal and co-presence is not interactionally poorer than one that supports co-exchange; it organizes different coordination demands and serves different social functions.

As interaction modes are interactional forms produced through publicly legible conduct, they leave observable signs that can anchor empirical identification in field settings (Goffman, 1963; Kendon, 1990; Patterson, 1982, 2014). These signs do not give access to inner states or intentions. They specify the minimum publicly available evidence by which each mode may be recognized. Table 4 summarizes these indicators based on the reviewed literature, which are diagnostic rather than exhaustive. These indicators should not be treated as a finished coding protocol.

Table 4
Indicative observable signs for recognizing social interaction modes in public settings.

Mode	Indicative observable signs
Withdrawal	Maintained occupancy of spatial refuge or boundary position; body orientation closed away from potential initiators; attention directed to private object or task; limited environmental scanning; no responsive uptake when others approach or gesture
Co-presence	Presence within shared perceptual field; calibrated spacing; brief non-sustained glance-return; peripheral monitoring without sustained gaze; stable anonymous proximity with no reciprocal address
Co-attention	Convergent orientation toward a common object, event, or scene; formation adjustment around shared referential field; synchronized looking; shared focus without turn-taking or direct address between participants
Co-exchange	Verbal or non-verbal exchange; greeting sequence; question-response pair; short turn-taking chain; reciprocal address with accountable uptake; opening and closing markers
Co-action	Established joint project; shared objects or tools; role differentiation; sequencing of contributions; mutual adjustment; visible repair when coordination falters; task-focused formation sustained over time
Assembly	Density exceeding small-group configuration; collective orientation toward shared focal point; coordinated movement or timing at crowd scale; publicly legible persistence as formation rather than dispersed co-location

Note: The table identifies observable markers by which the modes can be recognized. It identifies observable interactional patterns, not actors' intentions or feelings, and should not be treated as a finished coding protocol. Its purpose is to support more transparent identification of mode distributions, threshold crossings, and stalled transitions.

These indicators do more than support mode identification. They also help reveal where movement between modes occurs or stalls. For example, mutual perceptibility may exist without stabilizing as shared orientation, and shared attention may emerge without developing into reciprocal signs.

5.1. Dynamics of social interaction modes

Five properties recur across traditions in descriptions of how modes hold, shift, and break. First, the modes are distinct forms of coordination that serve different functions; they do not form a hierarchy. Withdrawal supports restoration (Kaplan & Kaplan, 1989). Co-presence sustains civility without intimacy (Tonkiss, 2014). Co-attention produces brief solidarities without requiring exchange (Peters, 2010). Intermediate encounters can be consequential in their own right, including as resources for coexistence and belonging, without presuming strong ties or sustained engagement (Neal et al., 2019; Zahnow & Corcoran, 2025). More interaction is not necessarily better. Encounter research cautions that routine co-presence and civility can sustain tolerance without respect; coordination patterns are organizational achievements, not guarantees of inclusion or attitude change (Valentine, 2008). Modes are publicly organized coordination patterns, not inner psychological states; psychological processes such as attention routing, privacy regulation, and restoration contribute to how modes are produced and shifted, but do not substitute for their interactional description.

Second, movement between modes is bidirectional and contingent (Fig. 1). Co-presence can shift to co-attention when a focal stimulus appears, or to withdrawal when discomfort arises. Assembly can disperse into co-presence under policing, or condense into co-action when logistics are organized. Threshold refers to a publicly legible reconfiguration in interactional organization. Shifts hinge on adjustments of bodies, gaze, and timing (Collins, 2004; Mondada, 2014). Material supports facilitate transitions, including playful surfaces and shared objects (Stevens, 2007). Recent work operationalizes interaction thresholds through a gaze-based typology, showing how co-presence can shift into accountable attention that may invite or impose engagement (Arminen & Heino, 2023). Modes can overlap within the same encounter as participants recalibrate their availability. Three further distinctions clarify how modes relate. First, some modes presuppose others as organizational conditions. For example, co-action presupposes co-presence, and co-attention presupposes co-presence. This is a constitutive relationship: co-presence is a structural ingredient of co-action, not a stage preceding it. Second, modes can co-occur empirically within a single encounter: co-action characteristically involves co-exchange, and assembly can contain co-attention, co-exchange, and co-action simultaneously. Third, transitions are not necessarily sequential or adjacent. A crowd can disperse directly into co-presence; co-presence can shift into co-exchange without an intervening co-attention phase. The transition labels in Fig. 1 identify common

coordination mechanisms between modes, not obligatory pathways. The groupings distinguish modes that do and do not require reciprocal address; they are visual aids rather than fixed stages or hierarchies. Fig. 1 shows recurrent modes of social interaction in public settings and common transition mechanisms between them. Arrows indicate possible shifts, not a fixed hierarchy or obligatory sequence.

Third, access to modes is uneven and selectively policed. Withdrawal is often denied through profiling and loitering/trespass enforcement (Anderson, 2011; Browne, 2015). Surveillance can render some groups hypervisible, reshaping co-presence and inviting interruption (Langegger & Koester, 2016). Co-exchange is tightened when lingering, solicitation, or street-level transactions are framed as sanctionable, raising the risk of openings for some groups and in some settings. Assembly is unevenly governed through permit regimes, protest zoning, and pre-emptive tactics (Butler, 2015; Mitchell, 2003). Socio-legal research shows how circulation-centered regulation frames stationary activities such as lingering, waiting, and assembling as sanctionable obstructions. Under those conditions, shifts from co-presence to exchange or assembly may depend on regulatory permission even in settings that appear to support them spatially (Blomley, 2010). The same place can enable different modes for different people. Distribution is therefore not separable from equity analysis.

Fourth, modes differ in their coordinative demands, so organizational work is required to establish and sustain each form. These differences are structural, not evaluative. Modes vary in the kind of coordinative work they require, not in social value or developmental status. Co-exchange relies on dyadic common ground and accountable uptake (Clark, 1996). Co-action relies on shared intentionality, role allocation, and sustained mutual adjustment (Tomasello, 2009). Assembly relies on crowd awareness and collective rhythm at a scale exceeding small-group coordination (Collins, 2004). Spatial arrangements differ in the participation cues they provide: the features of built space, furnishings, and design that suggest particular forms of approach, alignment, opening, and withdrawal (Hausendorf, 2013). These cues do not determine which mode occurs. The same counter, bench, or open forecourt can support different modes depending on how participants organize their attention and mutual availability within the setting. Each mode's organizational work is therefore shaped by, but not reducible to, the participation cues available. The differences between modes are specific and structural, not points on a single ascending scale.

Fifth, interactional qualities such as duration, intensity, intimacy, familiarity, and power shape how a mode is enacted without determining its organizational type. Co-presence among strangers and co-presence among long-term neighbors share the same basic organizational form, even though the distance kept, the ease of acknowledgment, and the felt meaning of that presence may differ. Repeated familiarity can lower the threshold from co-presence to exchange, while power asymmetries or prior hostile contact can make a mode formally available but difficult or risky in practice (Blokland & Nast, 2014; Milgram, 1972;

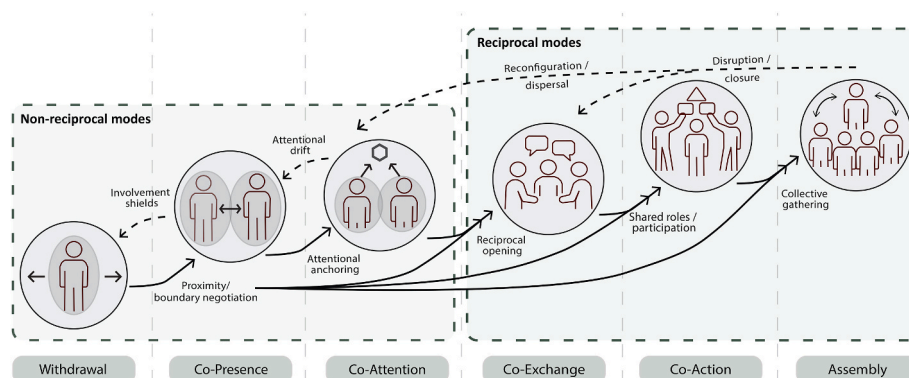


Fig. 1. Modes of social interaction in public spaces and their dynamics.

Valentine, 2008). Mode and interactional quality are distinct but closely related.

5.2. Reading contemporary challenges through social interaction modes

We illustrate the framework with two contemporary challenges. In each case, we identify which transitions become harder, which dimensions misalign, and why single-dimension interventions often fail.

Public spaces are routinely mediated by smartphones and social media. Personalized streams are inserted into shared settings, reshaping how attention is organized within the setting (Fig. 2). Classic accounts show how shared focal points pull individuals from co-presence into shared focus (Whyte, 1980). Location-aware apps and online feeds layer tailored content over shared space, so co-located people attend to different streams (Sutko & e Silva, 2011). The perceptual check that “we see the same thing” weakens because each person receives an individualized feed (e Silva & Frith, 2012). The fragile point often lies in the local verification of shared reference that stabilizes co-attention and lowers the threshold for openings into co-exchange. boyd (2010) describes this reorientation toward unseen online audiences as context collapse. Communication research describes this as socially mediated publicness, in which platform architectures and imagined audiences shape visibility and address even while people are physically co-present (Baym, 2015; Baym & boyd, 2012). The result is re-weighting of attentional obligations in the immediate setting.

Research shows that plazas did not empty with smartphone use (Hampton et al., 2015; Hampton & Gupta, 2008). Co-presence increased, but transitions from withdrawal and co-presence into locally shared focus and casual exchange became less frequent. The fragile point is the move into co-attention, co-exchange, and co-action. The misalignment lies in perceptual orientation, as attention is routed to remote content, and in normative address, as communication is calibrated to remote audiences. This helps explain why design changes alone, such as seating, often have limited effects unless attention is re-anchored locally.

Public-health measures during COVID-19 re-scripted everyday transactions and turned routine encounters into negotiated routines. Mondada et al. (2020) show how ordinary sequences for shopping were stretched and re-ordered. Face coverings suppressed cues supporting openings and repair, including expressions and lip-reading. Distance norms were recalibrated as health rules encroached on personal space. Regulations determined who could be present, for how long, and where to stand, and enforcement was uneven across places and populations (Robinson et al., 2024). Under pandemic conditions, co-exchange still occurred but became effortful. The rhythm of encounter was maintained

by adding steps (sanitizing, distancing, explicit confirmations) that made each move accountable. Assembly was reframed as a public-health risk. All four dimensions shifted simultaneously: spatial (barriers, taped lanes), normative (elongated turn-taking and confirmations), perceptual (masked faces and recalibrated distance), and political (orders setting the conditions of presence).

These examples show why single-dimensional interventions remain unstable. The same logic applies to other contemporary conditions discussed in the corpus, including intensified surveillance, privatized management, and event securitization, each of which reconfigures political authorization and perceptual visibility alongside spatial and normative organization.

6. Discussion

This review shows that six modes of public interaction recur across four research traditions despite divergent assumptions about what drives and sustains them. This convergence matters because it identifies interactional organization as a distinct analytic level with its own properties, situated between individual regulation and spatial configuration. The finding responds to longstanding calls for contextual frameworks that avoid collapsing physical, social, and economic dimensions of settings (Winkel et al., 2009), and it extends recent work on how environments shape group coordination as well as individual restoration.

For environmental psychology and related public-space research, the framework contributes a set of comparable descriptive units: modes, transitions, and four coordination dimensions. These make it possible to accumulate findings across studies that currently operationalize use or sociality in non-comparable ways. The framework also pushes analysis beyond activity-level classification by specifying what coordination work each pattern requires and where it fails. That, in turn, supports interaction mapping as a methodological tool focused on which coordination patterns a setting supports, where transitions occur, and where they are blocked. Instead of asking only whether a space is social, it becomes possible to ask which forms of coordination are present, which are absent, and whose access to them is enabled or constrained.

Empirically, the framework supports three cumulative claims. First, it captures variation in interactional form by specifying which modes predominate across micro-sites and times. Second, it assesses transition reliability by identifying which threshold crossings are easy, fragile, or systematically stalled. Third, it diagnoses dimensional misalignment by locating whether stalled change reflects unmet spatial, normative, perceptual, or authorization requirements. The four-dimensional lens keeps material arrangements, normative expectations, perceptual



Fig. 2. – Examples of Public interaction modes in a plaza.

conditions, and authorization within the same analytic frame, helping explain why place-making interventions can increase occupancy without expanding interactional diversity. Spatial change alone may leave normative rights, perceptual conditions, or political authorization unchanged. This is consistent with recent affordance research showing that public-space artefacts generate differentiated, user-shaped possibilities rather than fixed or uniformly perceived uses (Mohammadi, 2024; Widmer & Rérat, 2025). It also aligns with affordance-based design evaluation, showing that intended patterns of use and adaptive user behavior may diverge (Mohammadi et al., 2017; Mohammadi & Koutamanis, 2025). The framework therefore clarifies a key issue in affordance-based accounts: what supports co-presence may not support exchange, and what supports exchange among acquaintances may not do so among strangers.

For practitioners in urban design, planning, and public-space management, the framework explains why single-dimension interventions often underperform. Adding seating, improving lighting, or programming events can increase the probability of particular modes. But transitions may still fail if rights to initiate, perceptual conditions for shared reference, or authorization to linger remain unchanged. The framework leaves decisions about which modes a setting should support to normative and political judgment. It instead provides an analytic vocabulary for specifying what an intervention is designed to enable and what conditions must be met for that enabling to succeed. Effective design requires threshold flexibility, which refers to spatial arrangements that can accommodate the full spectrum of modes from withdrawal through assembly, without forcing particular interaction forms. The framework treats withdrawal and solitary co-presence as legitimate organizational forms, rather than as deficits to be corrected. This aligns with research on restorative environments showing that disengagement serves essential regulatory functions (Kaplan, 1995; Staats & Hartig, 2004). Settings that optimize for one mode (e.g., programmed events encouraging assembly) may inadvertently foreclose others (e.g., withdrawal, unstructured co-presence). The framework also foregrounds a distributional question often missed by evaluation metrics: who can access the modes a design makes possible, and under what conditions (Anderson, 2011; Browne, 2015)? In this sense, it extends recent work on intimacy and territory to the question of whose coordination is facilitated or blocked in contested public space (Meagher, 2026).

A key limitation is that convergence here indicates functional equivalence in interactional organization, not agreement about causal mechanisms. Descriptive overlap does not resolve whether ‘co-attention’ in perceptual research refers to the same phenomenon as ‘shared focus’ in micro-interactional accounts. Citation-trackable, accessible, English-language sources bound the corpus and may underrepresent embedded, practice-based, or non-Western knowledge about public coordination. Four absences warrant acknowledgment. The corpus may underrepresent (1) Global South scholarship with different classificatory distinctions, (2) practitioner knowledge outside citation networks, (3) non-English scholarship with distinct genealogies, and (4) emerging work on platform-mediated publicness that may require additional coordination dimensions. The four-dimensional lens is an abductive product of this review and may require extension in domains where other constraints are decisive, including institutional rhythms, infrastructural maintenance, or platform governance.

The framework opens four immediate lines of empirical and methodological development. First, empirical studies should test the portability of the six modes across cultural and governance contexts. The present corpus is weighted toward North American and European settings, and whether additional modes emerge elsewhere remains an open question. Second, future work should develop and validate observational protocols that use the indicators in Table 4 to assess mode distributions and threshold crossings across different settings and populations. This would move assessment beyond aggregate activity counts toward comparable, cross-study evidence on which coordinative forms a setting supports and for whom. Third, studies should examine

how interactional qualities (e.g., duration, intensity, intimacy, familiarity, and power) modulate transition thresholds across settings, and what qualitative variation within modes produces relationally and socially over time. Fourth, integrating the framework with the person-perception literature, particularly work connecting space-based stereotyping to how social behavior is interpreted, would address a significant adjacent line of inquiry that the present review identifies but does not synthesize.

7. Conclusion

This meta-narrative review synthesized research across four research traditions to develop an integrative framework for analyzing social interaction in public space. Across these literatures, we identified six recurrent modes (withdrawal, co-presence, co-attention, co-exchange, co-action, and assembly) despite divergent assumptions about what drives and sustains them. Their recurrence indicates that they capture robust organizational features of public life that extend beyond any single disciplinary vocabulary. For person-environment research, the framework offers a comparative vocabulary for linking psychological, sociological, design, and political accounts of public coordination. It shifts analysis from interaction frequency to organizational form and transition reliability, and it clarifies why similar occupancy levels can yield very different interactional possibilities. The four-dimensional lens helps diagnose those differences by locating whether the relevant constraints are spatial, normative, perceptual, or political.

Three practical implications follow. For researchers, the mode vocabulary supports systematic observation of coordination patterns across settings, moving beyond aggregate activity counts toward identifying which forms of interaction a setting supports and for whom. For designers and planners, it clarifies that enabling a particular mode requires more than spatial provision; it also depends on normative legitimacy, perceptual access, and authorization to participate. For policy, the four-dimensional lens brings distributional questions to the foreground: whether the interactional possibilities a setting affords are accessible to all users, or whether access is unevenly shaped through design, regulation, and enforcement.

The framework reframes social interaction as an observable feature of public life: patterns of coordination that can be specified and assessed, and that environments can support or constrain. This issue is increasingly salient as digital mediation and surveillance reshape who can appear in public space and on what terms, with effects that can operate simultaneously through spatial, normative, perceptual, and authorization conditions. The framework does not resolve disagreements about causal mechanisms. Instead, it provides shared descriptive units for comparing what different traditions observe, while preserving their theoretical differences about how coordination works. Whether the six modes remain robust across cultural contexts, governance regimes, and platform-mediated forms of publicness is an empirical question. Testing their portability is a necessary next step toward cumulative explanations of social interaction in public space.

CRedit authorship contribution statement

Mohammad Mohammadi: Writing – review & editing, Writing – original draft, Visualization, Resources, Project administration, Methodology, Investigation, Funding acquisition, Conceptualization. **Erwin Heurkens:** Writing – review & editing, Supervision, Resources, Project administration, Methodology, Funding acquisition. **Mohsen Mohammadi:** Writing – review & editing, Visualization, Validation, Methodology, Investigation, Conceptualization.

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