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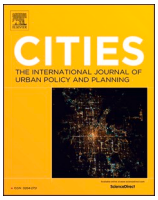

Rethinking urban street experiments through Lefebvre's rhythmanalysis: From vehicles and vibrancy to virtuosos

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ABSTRACT

Streets, vital for vehicular and pedestrian traffic, are increasingly repurposed to enhance urban vibrancy beyond transport needs. This paper explores intentional and spontaneous street experiments, drawing on Henri Lefebvre's rhythmanalysis. Streets are seen as hosts to intersecting rhythms shaped by daily routines and mobility, with users as performers in rhythmic interactions. While initially disruptive, these experiments strive to integrate innovative elements for cohesive urban compositions. Through a musical metaphor, the paper promotes a holistic approach to identifying rhythms influenced and introduced by street experiments. It examines how these rhythms interact, presenting as synchronised dynamics, disruptive discordance, or coexistence in dissonant compositions. Combining rhythmanalysis with spatial discourse analysis, the study 'reads' and 'listens' to temporary spaces through historical records ($N = 55$) of seven street experiments in Hong Kong from 2016 to 2020. Findings uncover the overly abstract agendas of these experiments — exemplified through narratives involving chairs, railings, and traffic signals — often oversimplify and exclude possibilities. The paper calls for open dialogue to capture power dynamics in street infrastructure and embodied lived experiences during the transition from vehicle-centred to people-oriented streets. It suggests rhythmanalysis as an initial tool for urban planners to envision streetscapes as symphonies, fostering sensitivity to time-space dynamics.

1. Introduction

Historically, streets were primarily seen as spaces for pedestrian activities. However, this perception underwent a significant shift with the advent of the automobile, particularly in the post-World War Two (WWII) era. Following WWII, streets gave way to roads prioritising automobility (Gartman, 2004; Henderson & Gulsrud, 2019; Schmucki, 2012) and various regulatory interventions collaborated to identify and oversee moving entities on the streets, within and across boundaries (Cresswell, 2010), prompting reflections on the intended and unintended consequences of mobility on freedom and unfreedom (Freudendal-Pedersen, 2016). The intricate relationship between motorised and non-motorised transport stems from a post-WWII paradigm shift in urban planning (Gartman, 2004; Henderson & Gulsrud, 2019; Schmucki, 2012). The contemporary urban landscape is predominantly shaped to accommodate cars, intentionally fostering their flexibility (Cox & Koglin, 2020; Koglin, 2017, 2015; Verlinghieri & Schwanen, 2020). However, this car-centric focus often compromises pedestrian and cyclist convenience (Soliz & Pérez-López, 2022), evident in detours, added time, effort, and safety risks (de Hartog et al., 2010; Heinen et al., 2010; Xu et al., 2024).

In response to contemporary challenges, there is a growing interest among scholars and policymakers in reimagining streets as more than mere conduits for traffic. This involves integrating non-traffic functions and services to foster convivial and sustainable urban environments (Creutzig et al., 2020; Karndacharuk et al., 2014; Villani & Talamini, 2021). This transformation poses challenges for contemporary transport planning, urging the adoption of innovative approaches to tackle the issues arising from rapid urbanisation and evolving urban dynamics. Tactical urbanism has emerged as a pivotal strategy, emphasising short-term, cost-effective interventions to prototype planning ideas, thereby influencing long-term urban development strategies (Marcheschi et al., 2022; VanHoose et al., 2022; Zhao et al., 2024). At the core of this approach are street experiments, reshaping urban mobility and promoting streets that prioritise people over motorised traffic (Smeds & Papa, 2023; VanHoose et al., 2022; VanHoose & Bertolini, 2023; Verhulst et al., 2023; Zhao et al., 2024). This global shift is evident in initiatives such as the Oxford Street experiment in London (Turner & Giannopoulos, 1974), showcasing the potential of pedestrianisation to address conflicts between pedestrians and vehicles. Cities like Madrid,

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Helsinki, and Oslo actively restricting private vehicles in city centres exemplify the trend towards prioritising pedestrians and creating more liveable urban spaces (Filippi, 2022; Nieuwenhuijsen, 2021). Despite positive strides, street experiments face challenges in balancing diverse transport modes and non-mobility functions (Bertolini, 2020; Verlinghieri et al., 2023). Successful experiments require collaboration among stakeholders and authorities (VanHoose & Bertolini, 2023). Scholars advocate for a natural experiment approach, leveraging disruptive events like health pandemics (Glaser & Krizek, 2021; Lu et al., 2021; Verhulst et al., 2023; Villani & Talamini, 2023a; Zhao et al., 2024), social movement (Chan & Zhou, 2021; Talamini et al., 2022), or new transport infrastructure (Sun et al., 2020; Sun & Du, 2023), to address urban mobility challenges and bring systemic change. Despite numerous street experiments, many have failed to transform the current streetscape.

The paper posits that the success or failure of street experiments extends beyond policy support (VanHoose & Bertolini, 2023; Villani & Talamini, 2023b) and governance of transport experiments (Verlinghieri et al., 2023) and is shaped by the disharmony between users' embodied rhythms of movement and the tangible expressions of rhythms, such as experimental interventions. It advocates for a deeper understanding of the intricate and ambiguous nature of street experiments, emphasising the examination of nuanced socio-temporal patterns defining micro-level experiences. In contrast to existing literature on street experiments (cf. Bertolini, 2020; Kinigadner et al., 2024), this paper distinguishes itself by delving into the finer details of temporality and spatiality by approaching rhythmanalysis as a 'strategy of inquiry' rather than a rigid method. Specifically, it focuses on socio-temporal rhythms in temporary arrangements, departing from broader discussions on longer-term change (VanHoose et al., 2022). Similarly, the spatial exploration concentrates on specific streets within locales, eschewing the usual emphasis on transition and diffusion-centric strategies for citywide or systemwide impacts (Bertolini, 2020; Zhao et al., 2024).

Drawing inspiration from Lefebvre's (2004) rhythmanalysis, streets are viewed as dynamic hosts for intersecting polyrhythms (Fig. 1). Street users actively engage as performers, partaking in rhythmic street pieces. Street experiments, resembling musical interventions, introduce innovative rhythms to the urban landscape. While these interventions are initially disruptive, their ultimate aim is to contribute to cohesive and harmonious urban compositions. This rhythmic perspective provides a distinctive strategy for understanding the dynamic interactions among urban spaces, inhabitants, and experimental interventions, envisioning the cityscape as a living symphony guided by rhythmic patterns. The study employs a musical metaphor to promote a holistic view of identifying diverse street rhythms, including those influenced and introduced by experiments. It delves into how these rhythms interact, giving rise to harmonious or discordant street compositions. Employing a temporally, multisensory, and rhythmically oriented approach, along with multi-source data, the investigation utilises embodied sensory perceptions to navigate the intricacies of street experimentation, blending theoretical insights with practical applications.

Findings from Hong Kong, known for its high-density urban environment and efficient transport system (Chan, Xu, et al., 2023; Tsoi & Loo, 2021, 2023), suggest that while some street experiments align with rigid, abstract, and predetermined agendas, others, especially spontaneous ones, reveal hidden rhythms arising from dynamic human-environment interactions, potentially leading to longer-term changes. This underscores the importance of considering street spatial and temporal dynamics and emphasises the need for harmony in transitions from vehicle-dominating to people-centric streets. Rhythmanalysis is presented as a crucial tool for urban planners, fostering sensitivity to time and space and envisioning urban settings as symphonies or operas.

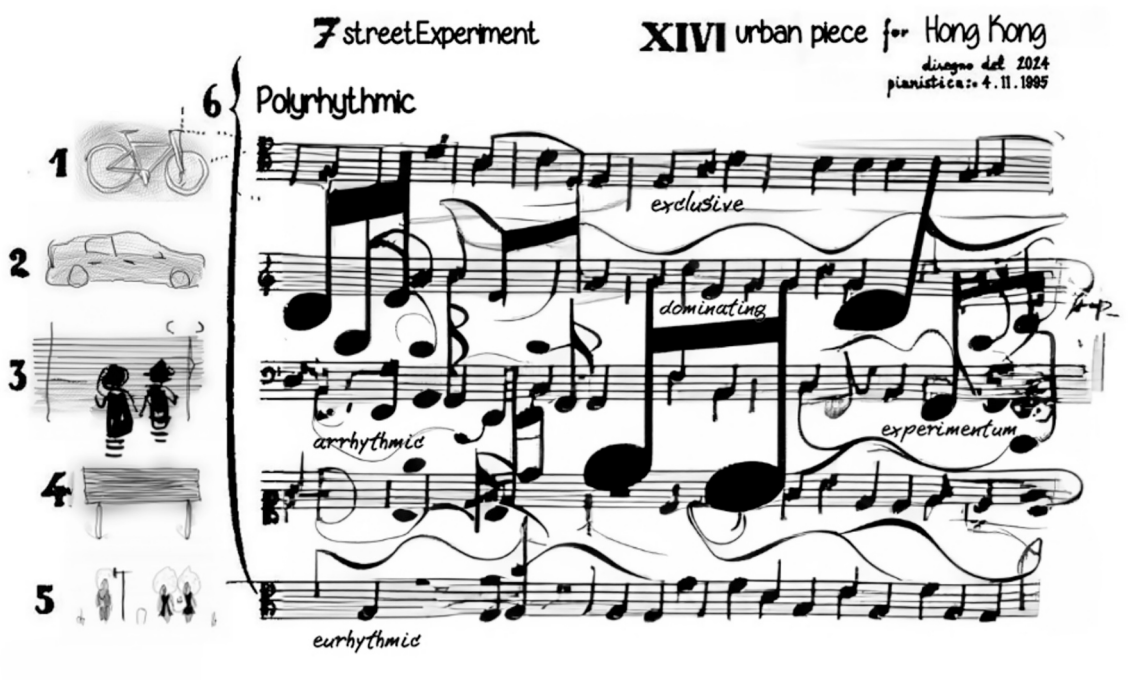


Fig. 1. Graphical abstract[1]. '*As music demonstrates, the question of rhythm raises issues of change and repetition, identity and difference, contrast and continuity*' (Elden, 2013, p. xii). In any street experiments, this paper advocates for open dialogues to capture embodied lived experiences, rather than adhering to abstract agendas that select, oversimplify, and exclude possibilities. '*Observe the street. Apply yourself. Note down what you see. Set about it more slowly, almost stupidly. Force yourself to write down what is of no interest. Don't write 'etc"* (Perec, 1974, p. 50).

[1]The graphic was created by the author, adapted from Deleuze and Guattari (1987, p.3). My intention follows the discussions by Bogue (2014) on how the music score guide readers in interpreting the author's 'performance' of the text.

2. Literature review

2.1. Lefebvre on rhythm

'[W]hat we live are rhythms' (Lefebvre, 1991, p.206). 'Everywhere where there is interaction between a place, a time and an expenditure of energy, there is rhythm' (Lefebvre, 2004, p.15). These rhythms create patterns of flow that contribute to a sense of continuity or disjuncture in everyday life (Edensor, 2016). He categorises rhythms into two main types: cyclical and linear repetition. Cyclical rhythms involve regular, repetitive patterns often tied to natural or social phenomena, such as daily routines or seasonal changes, providing a sense of stability in daily life. Linear rhythms, on the other hand, unfold progressively over time, leading to transformations or evolutions in situations and experiences. These rhythms can be associated with historical processes, societal changes, and individual life trajectories, including the monotony and alienation prevalent in everyday life within capitalist societies. Lefebvre's study of how human practices are rhythmically constituted, through both repetition and difference, aimed to explore the interplay between cyclic and linear rhythms in social time and space, particularly in urban settings.

However, it is essential to recognise that studying social change and transformation should not solely focus on linear rhythms. For Lefebvre, cyclical rhythms do not merely involve mechanistic reproductions of the same phenomenon but encompass a complex combination of repetition and novelty. Rhythms can take various forms, including corporeal rhythms (e.g., sleep-wake cycles), natural rhythms (e.g., daylight), institutionally inscribed rhythms (e.g., opening hours), and collective routines (e.g., commuting). Moreover, individuals often encounter and co-produce multiple rhythms simultaneously, resulting in cities (and streets) hosting intersecting rhythms, such as polyrhythmic (multiple), eurhythmic (harmonious and stable), isorhythmic (equal and in sync) and even arrhythmic (out of sync and disruptive), along with secret, public, internal, and external beats that together comprise the symphonic every day (Cresswell, 2016). By considering the interactions between both linear and cyclical rhythms, researchers can gain valuable insights into social phenomena and explore emancipatory strategies to counteract alienation and enhance the everyday experiences of individuals living in urban environments.

2.2. The rhythms of streets

In the street realm, conventional views, influenced by sedentarist ontologies of place, label streets as 'non-places', emphasising their transient nature (Auge, 1995; Cresswell, 2002). This perspective, prioritising stability, contrasts with recent research highlighting the emergence of places from mobility and social flows. Scholars have explored how mobility contributes to place constitution, infusing locations with meanings and cultural identity (Cresswell, 2016, 2002; Laurier, 2004; Massey, 2004; Urry, 2007). The concept of rhythm is a valuable tool for examining the interplay between place and mobility (Aldred & Jungnickel, 2012; Cresswell, 2023, 2016; Reid-Musson & Barber, 2021). Rhythm enables us to express the embodied experience of mobility over time and its role in shaping the perception of places (Cresswell, 2016). Our feelings and perceptions of places at different moments contribute to their significance to us (Gibert-Flutre, 2022). People's travel patterns, such as commuting (Edensor, 2008), are influenced by natural rhythms like daylight and institutional rhythms such as transit schedules and opening hours of amenities (Sun, 2022). Depending on their chosen mode of transport, individuals using the same street may experience mobile places differently. The collective routines and rhythms associated with various transport modes differ (Aldred & Jungnickel, 2012; Wunderlich, 2008). For example, bus travel involves time spent reaching and waiting at bus stops, leading to a stop-start rhythm while aboard the bus. Walking journeys can be either focused and solitary or meandering and sociable (Edensor, 2010). Cycling, with its flexible nature compared to cars, also exhibits diverse rhythms (Spinney, 2016).

Lefebvre's 'politics of space' provides a solid foundation for this exploration, challenging traditional planning by emphasising space's diverse uses and presenting a dynamic interaction between spatial practices, representations of space, and lived spaces (Lefebvre, 1991). Aligning with the paper's focus, streets transform from 'non-places' to dynamic spaces shaped by mobility and social flows. The concept of rhythm, introduced and further explored with rhythmanalysis in subsequent sections, underscores that places are influenced not only by transport modes and the environment but also by individuals' obligations and desires (Aldred & Jungnickel, 2012). Streets host an array of intersecting rhythms (Table 1), which can be polyrhythmic with separate pathways for different users, eurhythmic with harmonious coexistence of traffic and pedestrians in shared spaces, and isorhythmic at road crossings, where both traffic and pedestrians have synchronised crossing

Table 1
Lefebvre's concepts of rhythms.

Concept	Definition	Example on the street
Cyclic rhythm	Regular, repetitive patterns often tied to natural or social phenomena	Daily routines during travel
Linear rhythm	Processes unfold over time, leading to transformations or evolutions in situations and experiences	New transport infrastructure/interventions causing changes in travel patterns
Internal rhythm	Rhythms intrinsic to individuals or specific elements within the street	Pace of individual pedestrians, timing of traffic signals, regular intervals of street vendors
External rhythm	Larger, overarching patterns and structures within the urban context that shape the overall tempo and atmosphere.	Flow of traffic, patterns of public events, or the cyclical nature of daily activities of urban inhabitants
Embodied rhythm	Sensory and physical experiences of individuals, emphasising the connection between the body and the urban environment	Sensation of walking, sounds of footsteps, tactile experiences of the street
Disembodied rhythm	Abstraction of urban rhythms from personal experiences, patterns that exist independently of individual engagement	Statistical, data-driven street interventions that neglect the qualitative, experiential aspects contribute to disembodied rhythms
Natural rhythm	Inherent and cyclical patterns present in the natural environment	Daily rhythm of day and night, seasonal changes
Institutional rhythm	Structured and regulated patterns imposed by social institutions, organisations, or systems	Transit schedules, opening hours of amenities
Collective rhythm	Emerge from the shared practices, habits, and routines of a community or society, represent synchronised patterns of behaviour	Commuting at peak hours
Polyrhythmic	Multiple rhythms	Pathways for different users (e.g., drivers, pedestrians, cyclists; people with/out disability)
Eurhythmic	Harmonious and stable rhythms, balanced and coordinated, sometimes in parallel	Coexistence of traffic and pedestrians in (grade-separated) shared spaces
Isorhythmic	Equal and in sync, exhibit a regular or repeated pattern	Traffic light control for vehicular and pedestrian movements at road crossings
Arrhythmic	Irregular, out of sync and disruptive	Traffic incidents, transport service disruptions

times. Conversely, arrhythmic situations may arise due to regular conflicts, such as competition between cyclists and drivers for road space, leading to occasional incidents (Labelle, 2008; Laurier et al., 2008). Navigating these diverse rhythms, influenced by distinct interpretations and experiences of speed, time, and distance, is crucial for road users. Understanding these diverse rhythms on the streets and how they interact is vital in creating a harmonised street rhythm, fostering a more cohesive and efficient urban environment.

2.3. Applying rhythmanalysis on street experiment

Rhythmanalysis, as proposed by Lefebvre (2004), not only serves as a subject of study but also functions as a method of analysis. Its goal is to explore how time, space, and lived experiences intertwine, are influenced, and are shaped by diverse rhythms. Although Lefebvre's explanation of rhythmanalysis lacks specific practical details, researchers who have attempted to apply his ideas have used various methods. While rhythmanalysis may not yet have a well-defined and standardised methodology, several works have attempted to characterise its potential applications across different fields (Davies, 2023; Lyon, 2020).

Regarding street experiments, we can conceptualise them as disruptive interventions seeking to introduce new rhythms to the streets (Earl, 2023; Plyushteva & Schwanen, 2022; Sun, 2022). At first glance, street experiments involve hypotheses (i.e., expected rhythms) and aim to align their envisioned rhythms with their target audience(s). To comprehend this process, the concept of entrainment (Parkes & Thrift, 1979) proves useful. Entrainment refers to the synchronisation of certain elements that compel others to adopt or adjust to their rhythm. The strength of an element's entraining capacity determines how its effects will propagate through a polyrhythmic ensemble, resulting in greater rhythmic conformity, akin to an accordion effect. It is crucial to note that entrainment is not a deterministic, top-down, or hierarchical process emanating from a central authority; rather, it is open-ended, characterised by contestation, and emerges from local self-organisation. In the context of street experiments, unlike other regulatory interventions that impose total restrictions, agents are diverse and operate according to their own internal clocks, which adjust to one another's rhythms, at least in the short term. This perspective aligns with the observation that institutionally prescribed rhythms, such as the opening hours of facilities and public transport schedules, can influence the rhythms of various practices and individuals within a given location (Schwanen et al., 2012).

Assuming a successful street experiment results in a harmonised street rhythm, the key is how to integrate the diverse rhythms of the many. Firstly, it is important to recognise the existence of different rhythms on the streets, which requires a closer investigation of external (disembodied) rhythms through multimodal and metaphorical listening (Procházková, 2018). This involves engaging in spaces that includes observing, talking, feeling, smelling, seeing, and hearing to explore the intricate relationships between individuals, space, and society (Degen, 2008). Secondly, experimental interventions introduce new rhythms to the street and seek to establish rhythmic communication and exchange between the intervention and people. Users' bodily rhythms can be triggered by various sensory stimuli, such as sounds (e.g., musical performances) and visual or tactile elements (e.g., seating for rest), if the intervention aligns with their needs (Degen, 2008; Wunderlich, 2013). For instance, in a slow-paced, elderly-dominated neighbourhood, seating for rest might be more suitable than exciting facilities with a rapid rhythm. New rhythms can be characterised by slower rates of change that align with and complement existing rhythms. Sometimes, interventions may unexpectedly induce new rhythms, and in radical cases, attempts may be made to completely change the existing rhythm (see discussions on how these transformations are experienced everyday affecting the body-practice-environment relationship in Degen et al., 2010). The success of such interventions depends on their alignment with bodily rhythms rather than the revealed rhythms of the existing streets. This trial-and-error process is essential in conducting street experiments, as Lefebvre suggests, as a disembodied analysis of rhythm is insufficient. To appreciate external rhythms, one must listen to and understand their own bodily rhythms (Lefebvre, 2004), and sometimes necessitate creative methods to broaden perspectives on the relationship between senses, bodies, and the city (Buckingham & Degen, 2012).

Drawing on Henri Lefebvre's rhythmanalysis, this paper addresses two key research questions: (1) how to identify various street rhythms, including those influenced and introduced by street experiments, and (2) how these rhythms interact, either resulting in the formation of a harmonious street polyrhythm or introducing discordant rhythms that disrupt the existing fabric in an inharmonious manner. To achieve this, I utilise a musical metaphor to advocate for a comprehensive approach to identifying diverse street rhythms, encompassing those introduced and influenced by experiments. The core focus of the paper involves conducting a rhythmanalysis to examine the rhythmic effects of various types of street experiments.

3. Methodology

3.1. Research context

Hong Kong, a special administrative region of China, features a comprehensive public transport system comprising metro, buses, and minibuses, serving over 90 % of mechanised travel. In this context, walking is primarily regarded as the major mode of transport for the first/last mile transit access, designed for efficient connectivity and supporting vehicle and transit-oriented development (Chan, Ip, et al., 2022; Xu et al., 2022, 2024). Nevertheless, there have been ongoing citizen-led and state-led experiments on the streets, aiming to explore alternative uses of streets that go beyond merely serving as transport links for vehicles and pedestrians. These experiments recognise the potential of streets as places for various activities.

3.2. Research design

This study employs rhythmanalysis (Lefebvre, 2004) as its primary method, aiming to uncover the rhythms of everyday life in the context of street experiments that might otherwise go unnoticed or be taken for granted. This paper approaches rhythmanalysis as a 'strategy of inquiry' rather than a rigid method. Following Lefebvre's concept of 'receiving data from all the sciences' and 'receiving from the whole body and all senses' (Lefebvre, 2004, p.22), our method involves a multi-modal analytic approach that utilises multi-source, multi-sensory data to discern the various ways rhythms manifest, synchronise, accelerate, decelerate, or undergo strain in the context of street experiments for pedestrians. Both written field notes and reports, as well as videos of street experiments and interviews with participants and organisers, inside or outside the sites, are equally crucial in our rhythmanalysis. Historical videos are particularly valuable for researching participant groups and experimental investigators in situations where traditional (ethnographic) fieldwork is challenging due to restricted access or when events, such as street experiments, have already occurred (Lee, 2017).

Given the challenge of lacking first-hand experiences of historical events, spatial discourse analysis (Ravelli & McMurtrie, 2015) has been incorporated to address this data limitation. This approach starts from the premise that spatially informative texts—such as the documentation referenced in the next section—are composed of various communicative resources. This analysis investigates the interplay between language and space, examining how spatial attributes such as location, distance, direction, boundaries, and environmental characteristics influence communication practices and social dynamics. Spatial discourse analysis explores how individuals and communities utilise spatial references, metaphors, and narratives to organise their understanding of the world and to construct identities, power relations, and social boundaries. Simultaneously, rhythmanalysis complements spatial discourse analysis

by specifically focusing on the temporal dimensions of social reality and elucidating how time influences spatial practices within spatial-temporal materials and texts. The representation of both space and time emerges as a crucial aspect of both spatial discourse analysis and rhythmanalysis, encapsulating how spaces and rhythms are experienced, interpreted, and documented. This paper adopts an interpretative approach, recognising that individuals interpret and derive meaning from their experiences based on subjective perspectives, understanding phenomena from the rhythmic perspective. This approach encourages researchers to be reflexive and aware of their own biases, assumptions, and perspectives, acknowledging that the act of interpretation is influenced by the rhythmanalysts' background.

3.3. Research data

For the case studies, news searches are conducted to identify relevant online textual, audio, and video documentation published in local online newspapers and video-sharing websites, as these are major sources through which street experimental investigators often disseminate their work. Only materials in English or Chinese (both Cantonese and Mandarin) are considered. Specific search terms, such as 'street experiment' (街道實驗), 'community experiment' (社區實驗), 'community parlour' (社區客廳), and 'public space initiative' (公共空間活動), are utilised to identify cases of street experiments. However, distinctions had to be made as these terms can refer to different things in the context of Hong Kong. For example, 'community experiment' may encompass not only community space but also new work arrangements, and a 'community parlour' refers to a spacious activity space with or without community services. The term 'public space initiative' includes street spaces as well as parks and indoor spaces in malls and stations. In contrast to a systematic review, a purposive sampling strategy was intentionally opted for in our research (Campbell et al., 2020). This decision aligns with our goal of a targeted and exploratory approach, aiming to capture a diverse array of scenarios and contexts. By adopting purposive sampling, case studies that intricately align with the nuances and dimensions of our research question were actively sought out. This approach, though diverging from the traditional systematic review, better suits the exploratory nature of our study and aligns with our research objectives. It is crucial to acknowledge that our list (Table 2) is purposefully excluding non-street-related initiatives. My primary focus is on the (re) allocation of street space for experimental purposes, with a thorough examination of all relevant materials during our analysis (Appendix A).

3.4. Data analysis

Our qualitative inquiry relies on online documents and videos (notated as 'M' for quotation/reference in materials in Appendix A) to explore how street experimental investigators and existing transport systems shape the polyrhythmic nature of the city. Focusing on street experiments in Hong Kong, this paper analyses diverse online materials, including news articles, opinion pieces, reports, policy documents, videos, podcasts, blogs, and broadcasts, incorporating quotes from interviews, field notes/videos, and reflections from experimental investigators. This comparative analysis allows us to evaluate communication patterns and, consequently, social phenomena (Esser & Hanitzsch, 2013).

Beyond textual information from interviews, field notes, videos, and reflections, videos are essential as a reference point for reconnecting with locations, especially historical experimental sites (Paterson & Glass, 2020). Our analysis goes beyond video and interview text, integrating the walk/play in the street experiment. This inclusion allows us to 'imagine being there, experiencing … [the experiment] in three dimensions', incorporating various sensory elements and perceiving through virtual encounters within spatial-temporal informing texts and videos (Ravelli, 2019, p.210). The video playback enables the rapid sequencing of individual frames, providing insight into both the recorder's movement and the object's changes over time. Rhythm, characterised by a patterned recurrence of elements like beats or motions, contributes to an overall sense of flow or cadence. Instead of mere transcription, rhythmanalysis underscores the rhythmanalysts' reliance on their 'senses to receive data' (Lefebvre, 2004, p.22). This approach promotes a multisensory engagement, enhancing the overall experience and mirroring the intricate nature of real-life situations.

Furthermore, videos, considered as illusions rather than mere copies of movement and rhythm (Vannini & Vannini, 2017), create a 'quasi-suppression of distances in time and space' (Lefebvre, 2004, p.80). This perspective moves beyond passive observation, transforming viewers from mere *audience* to active participants with sensory and emotional responses. It also considers the pivotal role of the *editor*, emphasising engagement through actions like editing and sharing. This editorial process shapes the presentation of photographic stills and video frames, capturing dynamic rhythms within the videos. The reflective process of watching, feeling, and editing equips rhythmanalysts with a nuanced understanding of the temporal and spatial dimensions embedded in the videos. Recognising the analyst's subjective dual role as both observer and editor, this approach acknowledges that rhythmanalysts actively and creatively interpret the rhythmic qualities inherent in the videos. Adopting this embodied methodology enriches the subjective experience of conducting rhythmanalysis, complemented by participant interviews from both second-hand and first-hand sources, fostering a comprehensive understanding of the rhythms of place.

This paper employs the metaphor of streets as hosts to intersecting rhythms to facilitate an open-ended rhythmanalysis (Table 3). Viewing street users as performers, and experimental investigators as orchestrators, I explore the diverse tactics and material interventions aimed at creating cohesive urban compositions. This metaphor prompts a holistic perspective, encouraging the exploration of intricate relationships between rhythmic components, identifying materials introduced in street experiments and investigating their interactions with inherent and emerging rhythms. Utilising various data sources, this paper illustrates how this metaphor expands our understanding of streets as dynamic hosts shaped by myriad rhythmic forces, moving beyond their physical attributes.

The subsequent sections illustrate the key steps of our rhythmanalysis in the context of street experiments, including:

- *Identifying and understanding the existing* rhythms (Section 4): What sensory experiences are present on the streets, including what is heard, smelled, touched, and seen? What are the sources of these rhythms—are they from mobile elements like pedestrian and vehicular flow, or fixed objects like traffic lights, benches, or railings? How do these rhythms interact or coexist in parallel, and which rhythms form the main melody (domination) of the urban environment?
- *Intervening and destructing the existing* rhythms (Sections 4 and 5): What are the planned rhythms of experimental investigators, and how do they manifest? Which rhythms undergo change, and which remain unchanged? Are there any new or unexpected rhythms generated or induced as a result of the interventions? What triggers the activation of hidden rhythms, and to what extent are the introduced or induced rhythms disruptive?
- *Integrating a new poly*rhythm (Section 6): Can the rhythms induced during experiments be assimilated into the current socio-material setting, potentially influencing its own rhythm production? Are these induced rhythms acknowledged by authorities and stakeholders, within predetermined agendas? How can temporary polyrhythms persist if the experimental scene becomes 'permanent' – from linear to cyclic rhythms?

Through these key steps, this paper aims to illustrate a comprehensive analysis of the rhythmic dynamics inherent in street experiments, offering insights into urban compositions and the interactions among

Table 2
List of street experiments investigated.

No	Date	Location	Scope of experiment	Place for experiment	Duration	Reference
1	Sep 2017	Street railings	Call for the concept of street as place	Common street furniture in Hong Kong	1 day (3 sites)	Table 4h
2	Jun 2020	To Kwa Wan	Create common space for community services	Area of poor population with small living spaces	1 day	Table 4i
3	Mar 2016	Des Voeux Road	Reduce pollutions from transport by pedestrianisation	Business area with trams	1 day	Table 4a & 4b
4	Nov 2020	Sham Shui Po	Transform of certain areas into more enjoyable and playful spaces	School areas	3 days	Table 4c, e-g, k & l
5	Jul 2016	Paterson Street in Causeway Bay	Create informal public space to motivate such practice through practical initiatives	Densely populated area with limited recreational spaces	5 non-consecutive days	Table 4d
6	Sep 2019	Kwun Tong	Configuring queue zones for multiple bus lines and walkways	Crowded bus stops with proximity	Not available	Table 4m
7	May 2018	Central & Western District	Revitalisation of quiet streets for community use	Private streets with low pedestrian/traffic flow, spacious (long and wide)	In existence since 2018	Table 4j

Table 3
Metaphor of street rhythm performance techniques.

Metaphor	Technique	Example of rhythm intervention*
The basics		
Play	Musicians play rhythms on various instruments	Road usage
Arrange	Musicians and arrangers can arrange rhythms in a piece of music	Road management
Produce	Producers can produce rhythms in a recording studio	Temporary traffic and transport arrangements (e.g., plans for large-scale events)
Syncopate	Adding unexpected accents or beats to a rhythm, creating a more complex pattern	Incidents
Improvise	Musicians can improvise rhythms during performances spontaneously or without preparation	Emergency responses
The interventions		
Modulate	Changing the key of a piece of music, which impacts rhythms	Street repurposing
Sync	Musicians must sync their rhythms when playing together	Street furniture for pedestrians with different rhythms
Layer	Musicians can layer different rhythms to create depth and complexity	Grade-separated roadway, traffic zoning
Accentuate	Adding accents to specific beats can enhance the rhythmic feel	Road signage and symbols
Blend	Rhythms need to blend well together for a pleasing sound	Road intersections and crossing

* Rhythm interventions are not limited to single effects; the examples provided are drawn from envisioned and observed rhythms in our case studies. It is crucial to emphasise that the effects stem from the interconnectedness and co-constitution of social and material elements, shaping human experiences, practices, and understandings of the intervention, of which impact can vary across different geographical and social contexts.

polyrhythms.

4. The rhythmic intervention

Street experiments in Hong Kong involve diverse initiatives led by community organisations, collaborating with non-governmental organisations, government departments, or operating independently by residents. These experiments span various neighbourhoods and encompass different street spaces, from public and private streets to major and minor roads, local streets, loading areas, and even street furniture like railings, crossings, and signages. The durations of these experiments vary, lasting from a single day to a year (Table 2). This diversity offers insights into experimental area location within the transport network, proximity to community centres, user-friendly amenities implementation, potential visitor attraction, and street space utilisation for regional revitalisation.

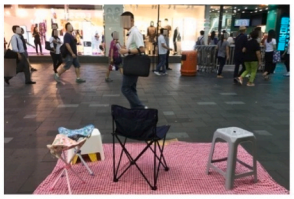
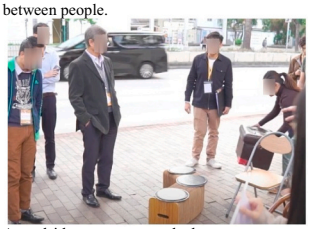
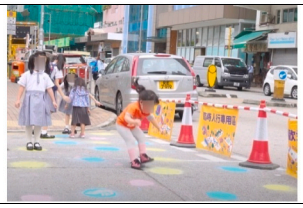
Some experiments align with the concept of tactical urbanism, emphasising temporary changes in street use with a focus on people-centric transitions within a broader urban context (Bertolini, 2020; Beukers & Bertolini, 2021). Motivations for these experiments include '*right now is all about efficiency [...] leaving little room for a pleasant pedestrian experience [...] it's time to make our city more enjoyable and vibrant*' (M4.1). Certain initiatives, like cases 1, 3, and 4, aim for diffusion-oriented outcomes, inspiring positive changes beyond their immediate locations. Others, categorised as 'place-based' visions (Lai, 2023), focus on specific areas without intending to extend their activities elsewhere. Street experiments can emerge in response to unmet local concerns (as in cases 2 and 6) emphasised by quotes like '*to discover and develop small public spaces within the To Kwa Wan area for diverse groups to organise activities*' (M2.1), or collectively from the public, especially residents (as in cases 5 and 7) as emphasised by '*originally, it wasn't a planned public space, but users have interpreted it in different ways*' (M5.2).

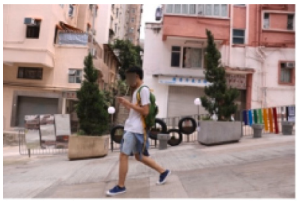
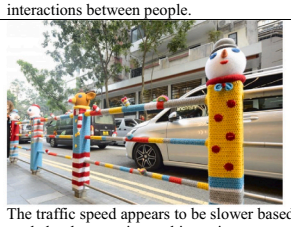
Instead of an exhaustive classification, this paper conceptualises street experiments as intentional initiatives integrating innovative elements into urban streetscapes. Regardless of their specific approaches, these endeavours collectively strive to reclaim the 'right to the city' and advocate for alternative urban designs that empower communities to assert control over public spaces (Castañeda, 2020; Middleton, 2018). This flexible perspective acknowledges the multifaceted nature of street experiments as dynamic interventions shaping the urban environment. Although they may temporarily disrupt the norm to spur reflection and debate (i.e., be arrhythmic), the ultimate goal is to achieve cohesive and harmonious urban compositions that align with inherent multiple rhythms over time—polyrhythmic and eurhythmic, a 'normal state' as termed by Lefebvre (2004, p.67). The following section explores rhythmic perspectives and interventions in street experiments, detailed in Table 4.

4.1. Street repurposing

Street repurposing is a transformative initiative challenging the conventional use of city streets, predominantly reserved for motorised traffic (Bertolini, 2020). Examining the case of street repurposing on a major traffic road in the Central business area (Table 4a), traditionally dominantly **played** by vehicular activity, reflects the rhythm of road

Table 4
Illustrations of the rhythm interventions.

Rhythm intervention	Rhythm*	
	Normal (before)	Experimental (after)
Street repurposing		
(a) One side of a 200m long section of traffic road transformed into a pedestrian zone, with numerous banks and restaurants lining the street (M3.5)	 Major roads with heavy and fast traffic, accompanied by a bustling pedestrian environment.	 Resting spaces free from traffic, promoting increased interactions between people.
(b) Children playing football on the "football field" in a temporary pedestrianised local street (M3.3)	 Minor roads with moderate traffic and pedestrian activity.	 A vibrant and interactive environment with increased social interactions.
(c) Playful facilities in the streets next to schools (M4.10)	 Minor roads with parking, moderate traffic and pedestrian activity.	 A vibrant and interactive environment with increased social interactions.
Street furniture		
(d) A picnic cloth, six chairs of different sizes, and a piece of cardboard with 'welcome to sit down' written on it (M5.2)	 A crowded and fast-paced pedestrian environment	 Pausing on a busy street with minimal social interactions between people.
(e) A rest area at roadside turning the spaces between the trees into a garden and somewhere to sit. (M4.12)	 A typical pedestrian pathway alongside the traffic road.	 A roadside rest area near the bus stop.
Pedestrian crossing facilities		
(f) Marking pedestrian crossings and prohibited parking areas with coloured dots and lines on the ground (M4.11)		

	Conflicts between traffic and pedestrians are common.	Make a slight improvement in the situation.
(g) Light strips on the ground for individuals using devices, elderly, and people with visual impaired (M4.3)	 Pedestrians using devices can be obstructive at times.	 Make a slight improvement in the situation.
Street railings		
(h) Railings with amusement mirrors, car tires transformed into bookshelves, fitted with potted plants and large wooden xylophone near sitting areas (M1.5)	 Local roads with slopes, slow traffic, and sparse pedestrians.	 Pausing on a quiet local street with minimal social interactions between people.
(i) Informal slow traffic zone with cartooned railings in school areas (M4.7)	 Traffic and pedestrian conflicts are common occurrences.	 The traffic speed appears to be slower based on observations made by the experimental investigator.
(j) Colourful railings with potted plants, greening, and plant exchange platform (M7.3)	 Residential private roads open to the public, with very few pedestrians and no traffic.	 Amenities that attract both residents and visitors to enjoy collective green spaces for relaxation.
Traffic zoning		
(k) Slow traffic zone with updated signages and speed limit in school areas (M4.4)	 Traffic and pedestrian conflicts are common occurrences.	 Traffic significantly slows down and improves the situation.
(l) 'Friendly path' for cart and wheelchair users (M4.3)	 Cart users are unwelcome on the streets; sometimes resort to walking on the traffic roads, affecting smooth traffic flows.	 Cart users choose the easiest path; pedestrians voluntarily walk on surfaces, maintaining a smooth flow of people and vehicle.
(m) Stick adhesive tape on the ground at the bus station, with each colour representing different bus routes, and indicate the queue direction (M6.1)	 Transit passengers are obstructing pedestrians and crossing, making passengers and pedestrians move and stop.	 Transit passengers are queuing up according to the floor's tape lines, without obstructing pedestrians.

*For the 'before' scenario, photos capturing the normal situation were sourced from Google Maps using the data-back function. For the 'after' scenario, photos were obtained from the specified sources.

usage. Road signage **accentuate** movement along major roads, with restrictions on vehicles turning into minor roads unless reaching junctions. This strategy **blends** the major traffic road with a network of local roads, creating a chessboard-like pattern. Pedestrian movement further complicates rhythms, as major roads divide the pedestrian network into the harbour and inner sides. The harbour side houses a significant bus and ferry terminal, with pedestrians and vehicles **layered** due to grade differences between pavements and traffic roads. Movements between harbour and inner sides are **arranged** by designated traffic signals, contrasting with pelican crossings **played** by pedestrians. Pavements accommodate diverse rhythms, including people walking, entering roads from local roads and alleys, exiting metro stations, waiting at bus stops, and engaging in various activities such as buying newspapers from temporary vendors.

The above rhythmanalysis elucidates 'the relationship between forces, which requires the domination of one force […] by a disassembly of times and spaces: of rhythms' (Lefebvre, 2004, p.68). We grasp the complex nature of the activists' statement on '*the car dominating city*' (M3.18) – how 'political power knows how to utilise and manipulate time, dates, timetables […] combin[ing] the unfurling of those that it employs (individuals, groups, entire societies), and rhythms them' (ibid, p.68). To fulfil the '*desire for a walkable city*' (M3.18), understanding 'the polyrhythmia of the social body that they set in motion' is essential (ibid, p. 69). This prompts a significant question about reconsidering the current balance that prioritises streets for vehicular movement, suggesting a potential reversal in favour of creating more public space and pedestrian-friendly areas. Inspiration drawn from the Occupy Central movement[1] (M3.5) influenced the initiator of a street experiment in the Central business area. This movement served as a natural experiment that **syncopated** the daily rhythms of the city for an extended period. The usual flow of time altered during protests, gatherings, and activities divergent from regular routines. People **improvised** and transformed public spaces into hubs for collective action and social interactions, providing newfound freedom for activities uncommon in bustling urban areas. This occupation of public spaces **modulated** a new rhythm, causing a gradual shift in spatial rhythms. Residents and workers in the heart of the demonstration observed positive changes like improved air quality and reduced commuting times. This highlights the importance of residents' lived experiences in engaging with the city's rhythms (Ballico & Carter, 2021; Bolderman, 2020). The extended duration of movement provided residents with the opportunity to contemplate urban design, emphasising the necessity for increased pedestrian-friendly spaces.

These interventions specifically target parking and loading/unloading areas, transforming them into open spaces for leisure activities, particularly for children. The enhanced conviviality of the streets attracts children, often overlooked in their need for open spaces, encouraging them to walk, as expressed by a primary school student participant (May 2022, M4.11): '*I usually prefer taking a car so that I can enjoy the scenery. But if the street has more quirky things to play, I would prefer walking instead*'. This also highlights the importance of assessing how bodily rhythms align with potential interventions in public spaces for designing street experiments, as emphasised by other participants:

> *Usually (the street) is very quiet. There are no pedestrians and it's boring. But today (the date of street experiment), there are a lot of things to play on the streets, so I want to stay.* (Primary school student participant, May 2022, M4.11)

> *Here, drawing on the ground is allowed, but drawing in the park is not. Here, you can play badminton, but it's not guaranteed that there will be people playing in the park.* (Primary school student participate, Nov 2020, M4.8)

These quotes illustrate how specific interventions or activities are permitted in certain areas but not in others, closely linked to the bodily rhythms and preferences of individuals using the space. The new open spaces allow overlooked road user groups to **play**, creating new rhythms within protected areas. Playful facilities, such as a football field (Table 4b) and playground markings (Table 4c), **layer** the areas for vulnerable groups and **accentuate** the sense of playfulness. This environment is shaped by **impromptu** actions, like drawing on the ground, underscoring the importance of open space, not only for its literal meaning but also as an open mindset allowing emerging behaviours of street users.

4.2. Street infrastructure

Some experiments adopt a cautious approach, centring on addressing societal challenges such as traffic safety and visual enhancement. A key tactic involves redesigning city streets, allocating space for different traffic types, pedestrian crossings, and parking areas. Notably, these innovative ideas do not solely originate from top-down approaches; they can also emerge collectively from the public, particularly from the residents themselves.

4.2.1. Street furniture

Street furniture, a varied assortment of strategically positioned objects along streets and roads, serves multiple purposes. Its primary objective is to **synchronise** with street rhythms, enhancing practicality and vibrancy in pedestrian spaces while offering amenities for public use. The diversity of street furniture, in design and function, is often tailored to harmonise with the distinctive characteristics of the surrounding area. For example, an experiment with a chair as street furniture can present distinct rhythmic narratives, influenced by its location and context within the urban environment:

> *I placed different items on the streets for three afternoons and observed people's reactions for 3-4 hours each day for 3 days. Causeway Bay attracts a diverse group of people, including tourists, students, and office workers, and the pedestrian walkway on Paterson Street is wide and unobstructed. […] However, the negative aspect was that despite setting up these facilities for everyone's use, not many people actually used them.* (Experimental investigator, Sep 2016, M5.2)

The open experiment conducted in the busy Causeway Bay area (Table 4d) examined the impact of placing items such as chairs or picnic mats on the streets during specific time periods. Despite its dense population and limited recreational spaces, Causeway Bay attracts diverse pedestrian traffic, with the Paterson Street pedestrian walkway serving as an informal public space. The experiment successfully demonstrated the feasibility of creating an inviting and functional informal public space, particularly on hot days in Causeway Bay, offering an alternative spatial experience by briefly **syncopating** the prevailing rhythms of the location. However, despite efforts to establish a space for everyone, the

[1] The Occupy Central movement, launched on September 24, 2014, aimed to advocate for a democratic electoral system for the Chief Executive. As a strategic move to exert pressure on the authorities, activists set up tents in business areas for prolonged occupations, ultimately transforming these spaces into more enduring living space lasting for 79 days. The occupied sites were socially 'repurposed' for public open spaces, leisure activities, and tourism destinations, although it faced criticism for the 'secularisation' of democratic ideals (Lau, 2014). The various forms of repurposing, along with accompanying photographs, are elaborated in HKPSI (2014) (available in Chinese only). Despite the critique, the movement had a significant impact on reshaping perspectives regarding space utilisation and power dynamics (Chen & Szeto, 2017; Wang et al., 2019). Furthermore, it brought about changes in the arrangement of public transport services in the aftermath of the movement (Loo & Leung, 2017). Similar effects were observed in another social movement, the Anti-ELAB movement of 2019, with a greater emphasis on the integration of digital and physical spaces (Au, 2022; Chan et al., 2021; Chan, Ma, & Zhou, 2023, 2022; Chan & Zhou, 2021; He et al., 2024; Stokols, 2023).

newly introduced facilities received limited engagement. This suggests that the idea introduced through the open experiment may not have fully **synchronised** with the existing rhythms and practices of the location. The unfamiliar intervention possibly disrupted established usage patterns and failed to resonate with the everyday activities and routines of pedestrians in that context. Lefebvre's rhythmanalysis underscores the importance of considering existing rhythms when introducing new ideas or interventions into the urban environment. An intervention that **disrupts** or clashes with prevailing rhythms may face resistance and limited acceptance, resulting in minimal engagement from the local community. Understanding and aligning with the specific rhythms of a place are crucial for successful urban interventions and the creation of meaningful and vibrant public spaces.

Offbeat rhythms find success when they **harmonise** with existing rhythms, resonate with daily practices, and enhance the sense of place and belonging (Bennett, 2015). Another experiment, conducted in a local residential area in an old district (Table 4e), exemplifies this concept:

> *We identified a key issue through listening to various street users: a lack of sufficient resting spaces and shading facilities. To address these issues, we plan to create nearby resting spaces for seniors by adding benches under the large banyan trees, providing natural shading spots.* (M4.1) *The rest area by the banyan trees serves two purposes: it turns the spaces between the trees into a garden or seating area, and it becomes a public space for people to gather and chat.* (Experimental investigator, Dec 2019, M4.11)

The problem-solving initiative involved engaging with seniors to gather ideas for an ideal street, with observations on Pratas Street revealing a lack of sufficient resting spaces and shading facilities. Their encounter with an uncle's expressed desire for '*more benches and shelters for resting and protection from the weather*' (M4.1) led to the identification of this key issue. The proposed solution includes creating resting spaces for seniors by adding benches under large banyan trees, providing natural shading spots. Additionally, music-themed designs and ground-level jumping games enhance the area, making it pleasant for both children and parents. This effort aims to **sync** with the street's rhythm by providing spaces encouraging relaxation, social interaction, and community engagement.

In both cases, the experimental addition of chairs or resting spaces contributes to the rhythmic narratives of the respective urban environments. Initiators conducted rhythmanalysis to assess whether the chair **syncs** with street rhythms, formulating 'hypotheses that serve as a starting point for rhythmanalysis' (Lefebvre, 2004, p.74). Seating areas can create new rhythms in pedestrian movement and social interactions, transforming spatial and social dynamics. Engagement with specific user groups, such as seniors, contributes to forming distinct rhythmic patterns catering to community needs. These experimental additions to street furniture illustrate how urban spaces continuously shape and reimagine, each addition adding a unique layer of rhythm to the city's daily life. This emphasises Lefebvre's idea of genuine presence over abstractions and representations from external sources like the media, which may mask 'time, diachrony' (ibid, p.81).

4.2.2. Pedestrian crossing facilities

Addressing safety concerns is widely supported by society, as '*prioritising human life is a shared value among the public, the authority, and the government*' (Experimental investigator, Dec 2019, M4.13). Initiatives targeting traffic safety, especially for pedestrian road crossing, recognise road crossing as a rhythmic dance between drivers and pedestrians, where their movements and actions seamlessly **blend** (Reid-Musson, 2018). This dynamic interaction involves a synchronisation of actions, perceptions, and rhythms as both parties negotiate the crossing.

One example of pedestrian crossings is the zebra crossing, which grants pedestrians the right of way without traffic lights (Fig. 2). Drivers **play** a pivotal role in this interaction, needing to recognise and respond to pedestrians' intentions while crossing. Studies indicate that experienced drivers tend to adopt a more conservative approach, often assuming a 'pedestrian will cross' judgment by focusing on the upper body to discern intentions (Chen et al., 2019). Conversely, pedestrians influence the crossing rhythm through their **play**. Jaywalking, for instance, involves **syncopated** actions that disrupts pedestrian movements, potentially reducing driver reaction time due to unpredictability (Zhu et al., 2023). Pedestrians' wait-and-go behaviour at marked crossings is influenced by factors like car speed, traffic density, and signals from drivers. Regardless of whether the crossing is formal or informal, a safe crossing requires pedestrians and drivers to familiarise themselves with each other's rhythm.

In the street experiment at Sham Shui Po (Table 4f), large vehicles and illegal parking disrupts the natural rhythm, causing hindrances to pedestrian crossing, particularly children (M4.13). This disturbance poses safety concerns, impacting children's ability to cross the roads safely to and from school. Their visibility is compromised, **syncopating** the rhythmic flow of their movements and elevating the risk of accidents. To address this issue, the proposal suggests marking prohibited parking areas with coloured dots and lines, introducing a new visual element to the space. These markers serve to **accentuate** the rhythm that communicates the off-limits zones to drivers, prompting them to become aware and **sync** their behaviours accordingly. Pedestrians '*generally found it easier and safer to cross the road without worrying about cars*' (M4.13), reflecting a positive shift in the rhythmic experience of road crossings in the area.

Fig. 2. Illustrations and global example of the colourful road markings (M4.13). Implementation in Hong Kong detailed in Table 4f.

On the contrary, vehicular and pedestrian rhythms are **arranged** by the traffic light-controlled crossing (Table 4g). In contrast to pelican crossings, where pedestrians can actively press the button to control the traffic light, the traffic light-controlled crossing is fixed, as it is **produced** by the design manual. Its primary goal is to **sync** the street rhythms with a designated pattern—the green light time. Accidents often occur when drivers or pedestrians deviate from this rhythm, attempting to cross the intersection when the light is red. As a solution for the experiment, the authority implemented light strips on the ground (M4.3) to accommodate individuals using devices, the elderly, and people with visual impairments. These light strips **accentuate** the rhythm, communicating designated crossing zones to pedestrians who become aware of off-limits areas and **sync** their behaviours accordingly.

For Lefebvre (2004), it is crucial to look 'beyond the horizon, other horizons loom without being present, so beyond the sensible and visible order, which reveals political power, other orders suggest themselves' (p. 32). Interventions at various crossings not only signify these orders but are also seen as 'products of a system' (ibid, p. 32). The authority appears to prioritise smooth vehicular flow, reinforcing the idea that pedestrians bear responsibility for accidents. In contrast, road markings align with activists' vision for a 'human-centric, less-car city' (M4.13), reflecting a critical perspective on societal structures and potential political influences shaping street experiment rhythms.

4.2.3. Street railings

Instead of placing new street furniture, activists also tried to adapt existing facilities on the street. Railings are everywhere in Hong Kong for functional use. They aim to **arrange** the flow of pedestrian and vehicular traffic, especially at intersections and crosswalks. They also enhance safety for pedestrians and drivers by **layering** and preventing them from accidentally wandering onto the road or crossing at dangerous locations. They are typically made of metal, which align with code of practice for standard shape and length. Activists are trying to improve their overall appearance and aesthetics of a street or roadway, starting with railings as public space (Fig. 3a and Table 4h) to generate non-traffic functions for community use, and they regarded it as 'small change' (Fig. 3b) that would not draw many opposing comments. As an experimental addition, it may exhibit distinct rhythmic narratives depending on its specific location and context within the urban environment:

The proposal (Table 4i) underscores the profound influence of visual transformations on people's perceptions and engagements with streets, subsequently shaping the rhythms of daily life and interactions. One transformative element involves the integration of public art, introducing novel visual components to the streetscape. Public art installations contribute to reshaping the environment's visuality, fostering creativity and expression (see also Edensor (2010) for a series of walks entitled railings with auditory rhythms). Consequently, attitudes and behaviours towards the streetscape may be influenced, potentially impacting interactions within the urban space. Public art installations can act as focal points and communal gathering spaces, encouraging public participation and fostering a sense of warmth and belonging in the community.

Moreover, the proposal emphasises the redesign of railings and the strategic placement of vibrant facilities along the street. These visually striking features '*create a noticeable colour transition in the street environment, alerting drivers that they are entering a school zone and prompting them to slow down*' (Experimental investigator, May 2020, M4.7), **accentuating** their entry into a school zone. This **synchronisation** prompts drivers to decelerate, impacting traffic flow rhythms. The altered visuality and the presence of these features contribute to shaping drivers' behaviour and the overall rhythm of movement within the urban space. The redesigned railing design has also '*greatly changed people's mostly negative attitude towards railings*' (M4.7), indicating a shift in the embodied, sensory rhythms of individuals within the urban space. The negative perception towards railings likely had its own rhythm of discomfort or indifference (i.e., out-of-rhythm), which the redesigned railings have **disrupted**. This positive shift signifies a harmonisation of the new design with the daily rhythms of the community, aligning with Lefebvre's idea of rhythmic **synchronisation** between the built environment and its inhabitants. This suggests that urban interventions, such as railing redesigns, hold the potential to influence not only the physical landscape but also the affective and perceptual rhythms of the community, fostering a more harmonious and positive relationship between people and their built environment.

While initiatives on public roads primarily address common societal interests, especially safety concerns, those on private roads are more tailored to specific community issues. The initiatives in Table 4j distinctly focus on community-specific issues or occasionally emerge spontaneously. The **arrangement** of a plant nursery and the addition of handrails to private street railings cater to the unique needs of these localities. Addressing concerns about pet waste, a form of **syncopation**, involves **impromptu** actions, such as hanging potted lemon-mint plants on railings. In contrast to temporary installations on public streets, this approach entails '*direct communication with property owners and the opportunity to understand residents' specific needs for the streets [and] these customised facilities can stay in place for an extended period*' (Director, Apr 2019, M7.3), highlighting a collective rhythm formed by active **play** and **sync** from residents to seamlessly **blend** with the community's daily rhythms. The decision to extend private streets facilitates direct

Fig. 3. A sign attached to the decorated railings highlighting (a) railings as public spaces that can be utilised (M2.1) and (b) its "small change" to the neighbourhood (M7.3).

communication with property owners, fostering a deeper understanding of residents' unique needs. Positive communication and support from property owners demonstrate the **synchronisation** of efforts between the community and the implementing group. This mutual understanding and collaboration reinforce the notion that these initiatives are attuned to the community's rhythms, emphasising the importance of local context and involvement in the planning and development process.

4.2.4. Traffic zoning

Streets exhibit polyrhythmic qualities, and traffic zoning aims to efficiently **arrange** roads and municipalities by **layering** diverse flows in different areas. The focus often lies in zoning between vehicles and pedestrians. Slow traffic zones emerge in local neighbourhoods and vulnerable zones like school areas, intending to restrict vehicular speeds for accident prevention. Streets within these zones are frequently **accentuated** with road signage and marking (Table 4k). Studies indicate that drivers tend to overlook road speed signage and marking when familiar with the road (Angioi & Bassani, 2022; Fiolić et al., 2023). From the rhythmic perspective, familiarity establishes a collective, cyclic rhythm of habits, potentially diminishing attentional focus on road signage. In response, the unusual design of road signage may **syncopate**, serving as a reminder of introduced interventions to drivers. Rhythmanalysis here encourages exploring ways to harmonise safety measures in slow traffic zones, fostering a **synchronised** rhythm that aligns with the primary goal of accident prevention, ensuring the safety of pedestrians and drivers alike.

Urban zoning extends beyond vehicular and pedestrian separation to interventions among pedestrians (Table 4l and Table 4m). These interventions aim to **harmonise** polyrhythms resulting from diverse street activities. The first addresses issues during '*busy hours [that] bus stops experience long queues, leading to confusion and passengers queuing in the wrong lines [and] congestion that blocks the streets for pedestrians*' (District Councillor, Sep 2019, M6.1). Clearly marked queues establish a **layered** rhythm for waiting passengers, with each colour representing a different bus route and tape indicating the queue direction. This can alleviate congestion, offering a more harmonious experience for pedestrians and public transport users during busy hours. The intervention **arranged** movements at bus stops, influencing daily commuting and waiting rhythms. The second experiment introduced "*1-meter-wide 'friendly path' on a 2.8-meter-wide sidewalk [and] improved it by using wooden boards for a flat and distinguishable pathway*" (Experimental investigator, Oct 2018, M7.2). Aimed at *accentuating* a rhythm **layering** cart and wheelchair users, it potentially alters established pedestrian flow patterns. Marking these pathways attempts to influence how people **play** and interact in shared urban spaces, impacting daily rhythms of walking and navigating streets. Both interventions use physical markings to alter spatial organisation and, consequently, the temporal rhythms of urban spaces. They seek to **synchronise** and harmonise diverse street user rhythms, whether waiting for buses or walking along narrow sidewalks. With substantial physical presence on the streets, both interventions **accentuate** specific rhythms without **syncopation**, contributing to more efficient, inclusive, and harmonious urban rhythms.

5. Whose rhythms do (not) align? Whose rhythms are changing?

5.1. Identifying the out-of-rhythm elements

> **EI:** I observed a gentleman standing in front of a fashion store for quite some time, probably waiting for a friend. "If there were more benches here, would you sit down?" I asked.
>
> "No, why would I sit down on the street?" He responded naturally, as if it were self-evident.
>
> **EI:** Then there was a young person eating an ice cream nearby. "Would you sit down?" I asked.
>
> "No, it feels strange, and it would block the street". He thought for a moment and replied.
>
> ***EI:** It turns out that we are all not accustomed to sitting on the streets. Ordinary citizens sitting on the street would attract curious looks, but we are used to seeing street performers, domestic helpers, and vendors sitting there* (Field notes from an experimental investigator (EI), Sep 2016, M5.2).

The presence of a chair on a busy street (Table 4d) can be considered an out-of-rhythm element, as noted in the quote. The experiment involved engaging passers-by, questioning their willingness to sit on the street if more benches were available. The initial response reflects the ingrained rhythm of the street, where sitting on a busy thoroughfare is not a **synchronised** action. This response signifies a familiar rhythm of constant movement and bustling activity, where standing and waiting appear more appropriate than sitting. Similarly, the young person's hesitation to sit with an ice cream in the second response is influenced by the established rhythm of the street, associated with transient movement. The chair exhibits low entrainment capacity, with little or no sedentary effects on **modulating** existing rhythms. However, it is essential to view this as an open-ended scenario marked by contestation, emerging from local self-organisation rather than fitting into the streets, which is a response, not a failure. The absence of people sitting on the street, as revealed by the experimental investigator's reflection: '*we, Hongkongers, never thought about sitting on the street ourselves*' (M5.2) – a collective social rhythm in Hong Kong. Despite the presence of street performers, domestic helpers, and vendors who sit, ordinary citizens seldom consider sitting on the street themselves. The social rhythm has established a norm perceiving sitting on the street as unconventional. The experimental investigator underscores the potential for a rhythm shift if more people embrace this action. Collective acceptance could dispel the strange or awkward feeling associated with **improvised** sitting on the street, allowing the street rhythm to adapt to a new behavioural pattern. The entrainment capacity of the chair is socio-materially constructed, influenced by social interactions and societal norms, as '*if more people are willing to sit down, and if we all do it together, it won't feel strange or awkward anymore*' (M5.2). Urban spaces, street designs, and infrastructure play a pivotal role in shaping entraining capacity, influencing how individuals move, interact, and engage with their surroundings. The lack of initiative among ordinary citizens to utilise public spaces reflects the prevailing rhythm discouraging such activities, even with the introduction of interesting installations. Insights from another experiment (Table 4e) indirectly contribute relevant perspectives:

> *When a person walks down a street, they don't necessarily need a chair to sit down. […] For example, people gathering around a trash bin to smoke turns that location into a social space. Similarly, walking down a street can evoke different feelings. […] The mirror hanging on the railing distorts the reflections of passers-by, and they may feel delighted and start moving their bodies. In just a few seconds, this adds a different moment to the street* (Experimental investigator, Jul 2019, M1.5).

The quote encourages us to consider how the street's rhythm is not solely defined by the movement of people but also by the interplay of activities, interactions, and creative interventions. The chair, being a more static object, can be seen as an element that does not fully align with the fluid and dynamic nature of the street's rhythms. Instead, the focus is on the spontaneity and diversity of activities and interventions that can disrupt and enhance the street's rhythmic patterns.

Another experiment also faced criticism similar to the above, as it deviated from expectations, resulting in the setting appearing obtrusive

and disconnected from reality (M3.10 & M3.21). To comprehend the dynamic nature of this street experiment, video recordings (M3.21) are utilised to capture fleeting moments of mobile experiences (Rose, 2016; Spinney, 2011). Within these recordings (Table 5), various **layer** of rhythms can be observed. For instance, one can envision people engaging in the rhythm of sitting and chatting at the site [Rhythm A], while others were immersed in the rhythm of walking [B] or witnessing a singing performance [C]. Additionally, nearby traffic signals [D & E] and passing trams with horns [F] introduced their own rhythms to the scene. This multiplicity of rhythms significantly deviates from the common expectation of a resting place for sitting and chatting. Two reasonable factors contributed to this deviation. Firstly, the experiment was limited to a single-day event, unexpectedly attracting a larger number of participants than originally planned, thereby **syncopating** the envisioned rhythms. Had it been a longer-term setting, the situations might have been more in line with the expected rhythm. This also led to the lack of **synchronisation** in accompanying facilities, some of which were superfluous (e.g., the traffic signalling) or had an unnatural appearance (e.g., temporary railings). Another factor contributing to the **unblended** rhythm was the presence of various random activities surrounding the site. The area encompassed resting spaces, playful zones, singing performances, crowded and bustling walking pathways with people standing in the middle, alongside tramways, metro exits, restaurants, and shops, creating a **cacophony** of rhythms that lacked coherence among them. The absence of harmony between these disparate rhythms further added to the sense of disconnection and disjointedness within the experiment.

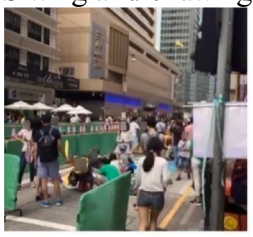
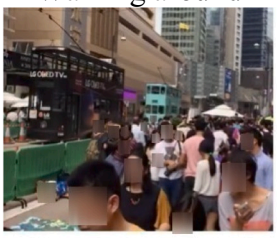
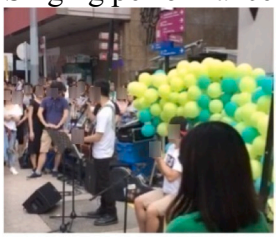
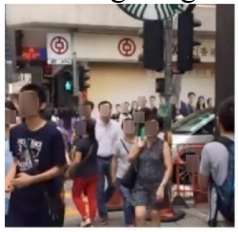
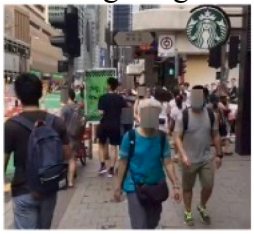
5.2. Listening to the hidden rhythms

Studying hidden rhythms, which can refer to the latent demand for a product that consumers cannot satisfy (Zerubavel, 1985), is a prevalent issue in designing various transport services (Kormos et al., 2019). While this investigation is commonly conducted using methods like choice experiments and model simulations, the concept of hidden rhythms is also applicable to street experiments. As Lefebvre (2004) stresses, 'there are no […] hidden, secret, rhythms, hence inaccessible movements and temporalities […] Everything knows itself, but not everything says itself, publicises itself' (p.17). He highlights the paradox that those who speak less about certain matters might possess more knowledge about them. Thus, street experiments give a short and temporary context for testing the hidden rhythms, with interactions and communications with the end users simultaneously – '*following them [the elderly] for a walk in the neighbourhood [and] talking to them*' (Experimental investigator, Dec 2019, M4.11). It is also noted that the period of experiment should not be too short, and such process of alteration and synchronisation of rhythms can be characterised by slower rates of change that align with and complement existing rhythms, as highlighted by the fact that '*the citizens were not very outspoken at first, or they didn't know how to express their desires. […] As we tested more prototypes and interviewed them further, they do think the street is a part or an extension of their home*' (M4.11). Understanding the bodily rhythms of this group and addressing their latent demand for comfortable resting places can contribute to the inclusivity and accessibility of the urban environment. In both cases, rhythmanalysis highlights the significance of recognising the diverse bodily rhythms and latent demands of different pedestrian groups. Planners should be proactive in gathering insights from various community members to understand their preferences and needs in public spaces, as remarked by an experimental investigator:

> *Additionally, we incorporated music-themed designs and jumping games on the ground to create a pleasant resting area for both children and their parents. This effort aims to make the community more comfortable and inclusive for all its residents* (Experimental investigator, Dec 2019, M4.1).

Such integrations of quiet and loud bodily rhythms illustrate a harmonious and stable piece on the street that create interventions that align with the desires of the community, ensuring that the urban environment becomes more engaging, inclusive, and enjoyable for all its users.

Table 5
Rhythmanalysis of a street experiment in Central business area.

Rhythm	A	B	C
Description	Sitting and chatting	Walking around	Singing performance
Frame			
Time	Throughout the video		
Rhythm	D	E	F
Description	Green light signal	Red light signal	Tram horn
Frame			
Time	3:26-4:00	3:32-3:38	3:38, 3:46, 3:49, 3:55, 4:00

6. Why have streets not transformed despite numerous street experiments? Orchestrated pieces versus spontaneous performances

To address the question of why streets have not transformed despite numerous street experiments, it is essential to understand the various ways in which these experiments interact with street rhythms. From the above analysis, we can discern at least four distinct modes of interaction: disrupting rhythms, changing rhythms, activating hidden rhythms, and (re)producing rhythms.

6.1. Disrupting rhythms

Street experiments are inherently disruptive, aiming to introduce new rhythms to urban spaces to enhance cohesion and harmony. However, certain street experiments may fail to achieve their intended goals, leading to what is perceived as 'unfavourable' outcomes (see Section 5.1). These initiatives often emphasise imposing linear rhythms on urban spaces, assuming individuals will conform to predetermined expectations set by experimenters. However, such efforts may overlook the complexities of spatiotemporal processes and existing cyclic rhythms, resulting in interventions that are ineffective or even disruptive. Illustrating this concept are narratives involving chairs placed in diverse contexts. For instance, a chair strategically positioned in a bustling area fails to establish a sedentary rhythm for fast-paced pedestrians, rendering it arrhythmic within the space.

6.2. Changing rhythms

The introduced rhythms tend to be linear as experiment planners, tend to abstract—select, simplify, and exclude—from the complexity of spatiotemporal processes, fixating on linear rhythms unfolding over time. However, Lefebvre advocates for a broader perspective on social change, urging a departure from exclusive focus on linear rhythms, the nature of intervention-induced rhythms, or those aligned with rigid, abstract, and predetermined agendas. It also involves attentiveness to existing cyclic rhythms associated with natural or social phenomena. Reflecting on street experiments aimed at creating resting spaces, it becomes apparent that individuals in busy areas are inclined to stand rather than sit – a sedentary rhythm, albeit eurhythmic, reflecting synchronised patterns within cyclic rhythms on a busy street. This underscores the necessity to break free from assumed agendas and attune to the present, acknowledging the ongoing rhythms of the city.

6.3. Activating hidden rhythms

Hidden cyclic rhythms may surface through spontaneous experiments devoid of a specific agenda (see Section 5.2). Initiators are more likely to recognise human-environment interactions that can transform seemingly insignificant interventions into practical additions or coexist harmoniously with existing rhythms. For example, placing a random chair at bus stops initially meant for casual rest leads to unforeseen developments such as the introduction of music-themed designs and jumping games on the ground. This evolution accommodates both elderly individuals and children frequenting nearby grocery stores and schools. The initial random thought becomes a note on the cyclic rhythms of commuting and essential trips, evolving into a successful street furniture that seamlessly integrates with the existing street rhythms. This narrative serves as inspiration for rhythmanalysis – a strategy of inquiry to exploring potential alternatives that strike a balance between envisioned transitions (top-down) and spontaneous actions (bottom-up). It considers the interplay of secret, public, internal, and external beats, collectively forming the symphony of everyday life.

6.4. (Re)producing rhythms

Street experiments are temporary interventions; however, they ultimately seek for longer term changes. Irrespective of the presence of a conductor, the street experiment revolves around the entrainment capacity, which could be various elements placed on the streets. The focus thus should be placed on understanding the properties of these elements, akin to a laboratory testing new substances. While hypotheses can be formulated, exemplified by the chair in the above contexts, experimenters examine socio-material properties under various social and material settings. The objective is twofold, which encompasses exploring material behaviours and assessing the extent of their impact within a polyrhythmic ensemble to foster harmonious conformity. It is crucial to note that entrainment capacity defies determinism, top-down imposition, or hierarchical control from a central authority (Parkes & Thrift, 1979). Instead, it is an open-ended, contested phenomenon emerging from diverse local social and material contexts. This aligns with Lefebvre's (2004) emphasis on measure (*la mesure*), highlighting that rhythm, although appearing natural, adheres to certain laws and obligations, implying a calculated and anticipated structure.

Numerous street experiments have been undertaken to revitalise urban spaces, yet they often fall short of achieving significant transformation. This shortfall may stem from the divergent approaches employed: those orchestrated by conductors versus spontaneous performances. Orchestrated experiments aim to disrupt and reshape rhythms, imposing linear structures onto urban environments with predefined agendas. However, these interventions often overlook the intricate spatiotemporal dynamics and cyclic rhythms inherent in city life. As a result, deviations from these predetermined plans may lead to ineffective or even disruptive outcomes, unfairly labelling unexpected rhythms as 'unsuccessful'. In contrast, spontaneous experiments hold the potential to activate latent cyclic rhythms, fostering unforeseen developments that seamlessly blend with existing street rhythms. These organic actions highlight the importance of breaking free from preconceived agendas and aligning with the ongoing rhythms of urban life. They have proven effective in integrating with existing street dynamics and nurturing harmonious interactions. By recognising the spontaneous emergence of cyclic rhythms, street experiments can unlock the potential for enduring transformations that resonate with the dynamic pulse of the city. This underscores the need for a balanced approach that embraces both top-down interventions and bottom-up spontaneous actions.

7. Becoming virtuoso urban planners

Rhythmanalysis serves as a strategy of inquiry for examining urban spaces as poetic entities, providing a methodological approach that goes beyond theory to shape forms, textures, and styles conducive to urban living. As Revol (2019) eloquently asserts, this urban poetics as 'a creative act steeped in knowledge, proceeds through experimentation, restores the rhythmic game that enriches our aesthetic experience of urban space and time' (p. 174). Our conceptualisation delves into street experiments as proactive and disruptive interventions, introducing novel rhythms termed arrhythmia by Lefebvre–disturbances in the urban system. In practice, this paper adopts a metaphorical lens and portrays streets as lived musical performances with street users as instrumentalists. In this metaphorical orchestration, street experiments actively modulate, layer, accentuate, and synchronise multiple rhythms to blend seamlessly. I argue that understanding the impact of street experiments involves identifying diverse rhythms on the streets, exploring their interactions, and culminating in the emergence of a harmonious street polyrhythm. I anticipate this to be an initial step for urban planners to evolve into 'future rhythmanalysts—professionalising […] and educating themselves to [be] more sensitive to times than to spaces […] without omitting the spatial and places' (Lefebvre, 2004, p.22). In the words of a rhythmanalyst, urban planners should be

capable of:

> *'listening to a house, street, a town as one listens to a symphony, an opera'* (Lefebvre, 2004, p.87).

Street experiments often have predetermined agendas, such as transitioning from car-oriented to car-reduced planning. This paper underscores the significance of considering both spatial and temporal dynamics during shifts from vehicle-dominant to people-centric environments. While the prevailing focus typically revolves around extracting 'lessons learned' for universal application, our work emphasises the importance of urban planners exploring the spatial dimensions of rhythms. Recognising how rhythm is intricately woven into the cultural and political fabric, with ties to the geographical imaginaries of a place, is crucial (Cresswell, 2023, 2010). Neglecting the spatiality of rhythms, as illustrated by the example of street furniture for rest, can lead to clashes between rhythmic practices from different places, such as sitting versus standing to rest. This concern extends beyond mere mobility (Cresswell, 2016) to everyday cyclical rhythms like sitting, standing to smoke (Marković, 2019), and eating/drinking (Sun, 2022) on the streets. This dynamic underscore the cultural and political implications inherent in street experiments, as highlighted in recent studies (VanHoose, 2023; Verlinghieri et al., 2023). These studies explore how rhythms from one locale may clash with those from another, introducing the radical notion that places can host alternative rhythms beyond the dominant global cadence. To enhance our rhythmanalysis, a wider reading of Lefebvre's work on the abstract space (Wilson, 2013) and politics of difference (Cresswell, 2023) provides a nuanced perspective that that facilitates a thorough examination of both macro dynamics, such as policymakers recognising dominant rhythms (VanHoose, 2023; Verlinghieri et al., 2023), and micro-level intricacies emerging from street encounters within the micro-spatialities of streets (Pile et al., 2023). This comprehensive approach contributes to a nuanced understanding of the politics of (poly)rhythm within the context of street experiments.

While this paper underscores the value of rhythmanalysis in evaluating street experiments, it also stresses the significance of considering how transport projects can shape novel mobility rhythms rooted in users' bodily experiences. This broader perspective is essential for appraising transport interventions. The challenge of representing rhythm analytically arises because it involves expressing something fundamentally rooted in embodied experience (Reid-Musson & Barber, 2021). The focus on walking mobility adds complexity, as it is a ubiquitous activity, but rhythms vary significantly based on social inequalities. To address this challenge, just as Lefebvre 'borrows and receives from his whole body and all his *senses*, so he receives *data* [*données*] from all the sciences: psychology, sociology, ethnology, biology; and even physics and mathematics' (Lefebvre, 2004, p.22, my italics), this paper adopts a multi-modal analytic strategy that integrates diverse data from multiple sources. Recognising the value of various data sources in rhythmanalysis is crucial, particularly given the brief durations of temporary street experiments. These short time frames present challenges in capturing the full temporal complexity using a single data source. Incorporating diverse data, including real-time observations, sensor data, and user feedback, allows for a nuanced analysis of temporal patterns (DeLyser & Sui, 2013). The multi-modal approach extends to multi-sensory experiences, exploring how rhythms manifest in the context of street experiments for pedestrians—whether practiced, synchronised, accelerated, decelerated, or strained. This inclusive approach broadens the scope of analysis to encompass sensory dimensions, enabling a comprehensive understanding of the multifaceted and polyrhythmic environments during these experiments.

CRediT authorship contribution statement

Tommy H.Y. Chan: Conceptualisation, Methodology, Formal analysis, Investigation, Data curation, Writing - Original Draft, Review & Editing, Visualisation, Funding acquisition.

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Data availability

Data will be made available on request.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.cities.2024.105175.

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