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Of Other Waterfront Spaces: Mixed Methods to Discern Heterotopias

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[Abstract]

In recent years waterfronts have progressively become the focus of local administrations, consultancy agencies, and private developers concerned with public health, city branding, and real estate development. Subsequently, they turned into central stages in which cities and societies can be *represented, contested, and inverted*. However, many questions remain unanswered concerning their capability to function as counter-spaces in the fast-changing dynamics of citizens' encounters and recreation in global cities. This paper employs mixed methods to examine the context-dependent association between space and behaviours. The comparative analysis of four waterfront parks in Venice, Shenzhen, Hong Kong, and New York sheds light on heterotopic sites' production and use. Two models

emerged: transient spaces of compensation and time-accumulating spaces of illusion. Beyond the novel research design, the significance of this study lies in validating Foucauldian-Lefebvrian heterotopology as an authoritative analytical paradigm for a critical interpretation of the urban.

[Keywords]

Waterfront; heterotopia; behaviour; Foucault; Lefebvre; landscape analysis; mixed methods; park; promenade; James Corner

Introduction

The garden is the smallest parcel of the world and then it is the totality of the world. The garden has been a sort of happy, universalising heterotopia since the beginnings of antiquity. (Foucault, 1986, p. 26)

Recent decades have seen the sprouting of a growing body of works on urban green and blue spaces based on rich scientific evidence of the health benefits associated with their vision, use, and interaction (Gascon et al., 2018; Labib et al., 2020; Subiza-Pérez et al., 2020). Furthermore, in an increasing global competition for human resources and foreign investments (Lu & de Jong, 2019; Ma et al., 2021; Ye & Björner, 2018), cities have progressively shown off waterfront green and blue provisions in association with shining contemporary cityscapes (Koelemaj, 2020). These spaces have become the objective of a real estate capitalization of their amenity value (Fageir et al. 2020; Lang & Rothenberg, 2017). Concurrently, coastal redevelopment is an increasingly necessary measure to prevent sea-level rise waterlogging (Bosselmann, 2018; Nicholls & Cazenave, 2010; Pethick, 2001). These are some of the critical reasons behind growing scholarly interest in waterfronts (Chan, 2020; Cheung & Tang, 2015; Macdonald, 2017; Porfyriou & Sepe, 2017). Recent studies have categorized and described waterfront parks based on physical or social features (Macdonald, 2017), the functional restructuring within the transformation of the cityscape (Cheung & Tang, 2015; Porfyriou & Sepe, 2017), and as part of a new mega-regional production of the public realm (Mitrašinović & Jachna, 2021; Porfyriou & Sepe, 2017). Nevertheless, some crucial questions remain unanswered: are waterfront parks of global cities other, in their conception and design, than conventional urban parks? If so, how are they perceived and used by the local population?

The COVID-19 pandemic offered an extraordinary occasion to record behavioural patterns during a period of global travel restrictions, in which the users of waterfront parks

were largely local. This peculiar condition revealed a gap between originally intended and actual uses, giving credit to the interpretation of the waterfront park in global cities as a contemporary heterotopia. The remainder of the paper is organized as follows. Section 2 critically reviews the notion of heterotopia. Section 3 introduces the research design, methods, and datasets. Section 4 presents and discusses the findings in seven subsections, focusing on waterfront park design intentions (4.1), landscape features (4.2 and 4.3), users/uses (4.4. and 4.5), and the association between landscape features and users' activities (4.6 and 4.7). Section 5 discusses the findings and their limitations. Section 6 concludes the article by addressing its significance for scholars, landscape architects, planners, and policymakers.

Heterotopia as a critical notion for a post-structuralist analysis of the urban

Initially a medical term, the notion of heterotopia was introduced to social science as an urban epistemology by Foucault in 1967 to describe the production of counter-spaces within the city fabric (Dehaene & De Cauter, 2008; Foucault, 1986; Sacco et al., 2019). The concept is deeply interwoven with the notion of deviance, a cornerstone of Foucauldian theoretical construction (Foucault, 2008). 'Heterotopias house all exceptions to the dominant city model' (Shane, 2005, p. 231). They are counter-hegemonic sites, by-products of the social and spatial ordering project named modernity, which aimed to regiment society through apparatuses for control and discipline (Hetherington, 1997). Notwithstanding their contemporary relevance and proliferation, heterotopias (1) are possibly found 'in every culture, in every civilization' (Foucault, 1986, p. 24); (2) are synchronic with their embedding culture, their function varying together with societal changes; (3) juxtapose several incompatible sites in a single real place; (4) operate a break with traditional time either by accumulating it (e.g. libraries, museums) or by an event-like transitory display (e.g. fairgrounds, vacation villages); (5) control access

through compulsory entrances or purification rites; and (6) are related to all the rest of the space as illusions (e.g. brothels) or compensations (e.g. colonies) (Foucault, 1986).

In contrast to utopias that ‘open up cities with vast avenues, superbly planted gardens’ (Foucault, 2005, p. xix), producing consoling yet chimerical narratives, heterotopias deconstruct the urban syntax (Tafuri, 1987). The vanishing of consoling modern utopian narratives coincides with the post-modern urban fragmentation driven by neoliberal forces following the 1973 oil crisis (Harvey, 2007). The disintegration of the urban fabric into fragments that are increasingly socially and economically polarized entails systems of simultaneous global connection and local exclusion, which in turn produce spatial marginalization and the juxtaposition of antithetical, often contradictory landscapes (Brenner & Keil, 2015; Brenner & Theodore, 2002; Marcuse & Kempen, 2000). The progressive conception of space as ‘relations among sites’ (Foucault, 1986: 23) proceeded at the same pace as the disembedding of social relationships from the local context and their restructuring on a global span across time and space (Castells, 2000; Giddens, 1991). Subsequently, the core of the global city is turned into a performative space where heterotopic sites are conceived and produced as simulacra to serve a non-resident global population (Baudrillard, 2016; Sacco et al., 2019; Yin & Qian, 2020). While initially overlooked, the Foucauldian formulation became a powerful notion for investigating the contemporary city, which has witnessed a vast production of heterotopias and the subsequent flowering of studies and publications concerned with their hermeneutics (Dehaene & De Cauter, 2008; Edwards & Bulkeley, 2017; Hetherington, 1997; Hook & Vrdoljak, 2002; Saldanha, 2008; Shane, 2005; Tafuri, 1987; Wesselman, 2013). Nevertheless, as suggested by Sacco et al. (2019), the Foucauldian notion is bound to a representational understanding of space and does not account for the ‘plurality of discourses and vocabularies’ (Lefebvre, 2003, p. 191) that constitute the situated dynamics of cultural and political appropriation of heterotopias. ‘Who is talking? Who is acting? Who is

moving in space?’ (Lefebvre, 2003, p. 191). Answering these questions enfranchises recognizing ‘the presence-absence that contributes to the population of urban space, of an elsewhere, a utopia’ (Lefebvre, 2003, p. 191). Following Sacco et al. (2019), the duality of the Foucauldian-Lefebvrian conceptualization offers a theoretical framework for disentangling the conflictual relations of powers in the production and the use of space.

This study is concerned with a particular type of heterotopia produced by the continuing process of urban renewal, economic rebranding, and social restructuring of the global city, namely, twofold-driven centrally located water-overlooking green sites for global repositioning and local real estate capitalization, based on cultural consumption and amenity value. These sites are increasingly taking space, both as *instagrammable* landscapes and as compensative embellishments of speculative development (Arts et al., 2021), and are conceived to serve a global population of young, highly educated professionals and cultural consumers. The halt of global travel due to the pandemic restricted the mobility of this population, allowing us to observe the ‘mythological machine’ of the waterfront park in an abnormal free-spin functioning (Jesi, 2000).

Materials and methods

This multimethod research combines quantitative and qualitative methods in an innovative research framework (Fig. 1). In-depth scrutiny of available empirical studies, data retrieved from Census, documentary research, and in-depth interviews enabled the compilation of datasets that serve as bases for comparison with primary data collected within the scope of this study. The overarching aim is to identify a multidimensional gap between the projected intention of space providers (administrative bodies and landscape architects) and the users/uses of the waterfront park.

The first comparative enquiry (Fig. 1, No. 1) concerns a systematic description of spatial qualities, focusing on the differences between generic urban park spaces and waterfront parks. Critical questions guide the investigation: ‘As for the heterotopias as such, how can they be described, what meaning do they have?’ (Foucault, 1986: 24). As proposed by Foucault, a systematic description is necessary to answer these questions: ‘We might imagine a sort of systematic description that would, in a given society, take as its object the study, analysis, description, and “reading” of these different spaces, of these other places’ (Foucault, 1986: 24). For this first level of inquiry, we relied on secondary data and in-depth interviews with knowledgeable informants.

Furthermore, as Lefebvre (2003, p. 191) advanced, ‘The description of isotopies and heterotopies goes hand in hand with the analysis of the acts and situations of these subjects and their relation to objects populating the urban space’. Subsequently, the second level of analysis (Fig. 1, No. 2) focuses on the population to investigate the different users/uses of urban parks and waterfront parks through behaviour mapping. Behaviour mapping is an empirical research method that builds on the unobtrusive observation of human behaviour to analyze and visualize behaviour patterns. It is often adopted to inquire into the association between users preferences and spatial features (Bechtel & Zeisel, 1987; Cosco et al., 2010; Elsheshtawy, 2013; Gehl, 1987; Goličnik Marušic, 2016; Mehta, 2009; Unt & Bell, 2014; Villani & Talamini, 2021; Whyte, 1980). It comprises three phases: the survey of spatial settings, the classification of activity types, and the geoprocessing of behaviour data for further analysis and visualization (Golicnik & Marusic, 2012). Behaviour mapping is typically carried out by employing on-ground data collection using snapshots or video recording. The dataset can be further processed and used for statistical analysis.

Lastly, the paper will analyze (Fig. 1, No. 3) the correlation between landscape features and uses to elicit the gap between design intentions and users’ preferences. This study adopts

descriptive statistics and Pearson's chi-squared test to illustrate and analyze the relationship between the categorical variables of landscape features and human behaviours.

< Figure 1 here >

Study areas

Four waterfront parks in Venice, Shenzhen, Hong Kong, and New York were selected as case studies, namely: *Giardini della Biennale* (GDB), Venice; Shenzhen Bay Park (SBP), Shenzhen; Kwun Tong Promenade (KTP), Hong Kong; and Domino Park (DOM), New York. This diverse selection intends to ensure the coverage of a variety of urban conditions of non-typical public parks. GDB was selected based upon considerations about its prototypical relevance as one of the first modern waterfront parks within an early global city. SBP and KTP were selected for their quasi-antithetical approaches and their regional significance as waterfront (re)development models within the Asian context. Eventually, DOM was chosen for its international standing, primarily linked with the notoriety of its designer. All four waterfront sites were developed on reclaimed land; nevertheless, GDB occupies the site of a pre-existing religious ensemble, KTP and DOM are post-industrial redevelopments, and SBP is located on newly reclaimed land. Moreover, the selection aims to cover Western and Eastern cases equally. Besides, the selected sites are some of the most famous green spaces of the four worldwide known cities in which they are located, and, as such, serve as landscape architecture references, whilst being visited by millions yearly.

Data collection and preparation

In order to collect first-hand qualitative information, seven in-depth interviews with knowledgeable informants were organized following a purposeful sampling. Two interviewees

were selected for each case. One informant was selected as a planning, design, and landscape architecture expert of the waterfront park except for DOM, for which relevant documentary and oral material was publicly available on the internet. For GDB the interviews were carried out in April 2021 with both an architect affiliated with Biennale (Interview #1) and a former Biennale operator and waterfront park user (Interview #2). For SBP we interviewed the head architect of the SBP competition-winning landscape project in May 2021 (Interview #3) and a Shenzhen landscape researcher and long-term waterfront park user in July 2021 (Interview #4). For KTP we interviewed the former director of the HKSAR Planning Department in September 2019 (Interview #5) and a habitual user in July 2021 (Interview #6). For DOM we interviewed a habitual user in April 2021 (Interview #7).

The on-site data collection focused on the publicly accessible area outside the GDB exhibition (ticketed) site and on a portion of SBP named Haiyun Park, located in the northern bay area adjacent to the Overseas Chinese Town (OCT) commercial and leisure mixed-use development, and well-known for its outstanding ocean-view. This study also covered the eastern part of phase two of KTP and the southern part of DOM, namely the ‘active recreation park’. The selected areas of the four sites were the objects of an investigation aimed at measuring the constituent landscape materials for a comparative examination and analysis of their association with human activities.

The degree of physical activity intensity was recorded as low, moderate, or high, based on commonly accepted standards (Piercy et al., 2018). Social interaction types were divided into two categories: social or individual. First-hand data were collected under similar climatic conditions (Table 1). The data were further processed using manual interpretation. Two trained assessors independently completed the geoprocessing; finally, the two datasets were compared, and, in case of incoherent interpretation, the observation was further investigated until an

agreement was reached. The resulting combined data set served the purposes of visualization and correlation analysis.

< Table 1 here >

Results

Results are presented in four levels of enquiry. The first section (4.1) follows Foucault's prescriptions in describing the four selected cases, focusing on the rationale for their production and original design; sections 4.2 and 4.3 analyze the landscape features of urban and waterfront parks and discuss the finding in light of the theoretical framework; sections 4.4 and 4.5 analyze users of urban and waterfront parks and interpret their difference; the last two sections (4.6 and 4.7) unfold the association between space and behaviours and its meaning.

Waterfront park design intentions

The four waterfront parks were designed in different periods and were driven by different goals.

GDB

The GDB accounts for about half the 120 ha of Venice's urban green space. The park's origins date back to 1807 when Napoleon Bonaparte decreed that an area at the eastern end of Venice be constructed consisting of an avenue with gardens to serve as a public pedestrian walk. The Italian neoclassical architect Gian Antonio Selva carried out the landscape design, which was an integral part of a vast plan for the city's modernization and regional infrastructural development driven by modern sanitary principles and economic growth goals. The public walk towards a small pavilion (in the original project to be crowned by a sculpture by Canova) on the top of the romantic Motta di Sant'Antonio (a small hill on the GDB eastern

side made from construction waste) was achieved through the demolition of a medieval religious site. Thus, the park epitomized the superimposition of a new French-born bourgeois spatial order over a former medieval one. By the middle of the century, the park had become a popular space of recreation for the Venetian population and, since 1895, has been partially used as the site of La Biennale Art Exhibitions (42 ha are currently leased to La Biennale, while the other 18 ha are for public use). GDB is a prototypical development of the 19th-century waterfront space that anticipated Frederick Law Olmsted's waterfront parks in Chicago and Boston by more than half a century. Noticeably, significant parallelism can be found in the GDB hosting the Venice Biennale in 1895 and the Olmstedian parks association with the Chicago Columbian Exposition of 1893.

Moreover, Olmsted's Wooded Island served as a naturalistic counterpoint to the formal neoclassical spatial structures of the rest of the exposition grounds (Schuyler, 2014). The naturalistic appearance of the Motta di Sant'Antonio was the only concession to the romantic approach in the neoclassical design of the Venetian gardens (Mulazzani, 2004). While the physical framework was determined since the original design over two centuries ago, pavilions were built over the years to function as national exhibition venues. After two centuries since its construction, the park is fully integrated within the city fabric and 'clearly identified as a public space' (Interview #1). However, its 'nineteenth-century spatial conformation' differs from the other urban parks whose 'spatial layout [is] defined by the stratigraphy of Venice and therefore by its original sediment from the Middle Ages onwards' (Interview #1). 'The layout of this public section does not really invite you to linger' (Interview #2).

SBP

The SBP is a 13-km-long waterfront park surrounding the Shenzhen Bay area, with 108 ha and 12 different themed areas, ranging from the ecological mangrove park (east) to the civic

and cultural park (south). Under the master plan by the government design institute, the China Academy of Urban Planning & Design, the decade-long project involved design collaboration with international firms such as SWA and AUBE. Part of the waterfront park was completed right before the opening of the 2011 Summer Universiade, providing lush settings to the Universiade main venue, the Shenzhen Bay Sports Centre. In the SBP, natural elements are emphasized in the Hongshulin Coastal Ecological Park at the eastern side of the waterfront redevelopment. The concept master plan was drafted by the American landscape firm SWA in collaboration with Shenzhen Beilinyuan Landscape & Architecture Planning & Design Institute (BLY). The project focuses on ecological restoration, a governmental vision for the coastal area, and the fast-changing demands of Shenzhen's rapidly developing districts (Qian et al., 2011). In an interview, David Thompson of SWA described the SBP as an example of 'how urban, high-density communities can give residents much-needed access to the outdoors while preserving native habitat and ecologies' (Business Wire, 2013, p. 2). A balanced ecological system that links humans and nature is the primary design intention for this project (Ren et al., 2010). In addition to the ecological aspect, the design was intended to establish a 'Bay Lifestyle' with 12 thematic areas to provide various landscape and activity zones, according to BLY's vice-president (Qian et al., 2011). The SBP is very popular for its uniqueness, lying in the exceptionality of this spacious waterfront space contrasting with the surrounding high-density urban core and allowing views of the Shenzhen skyline. However, the current landscape design of the park is perceived as 'relatively simple [...], not particularly attractive [...] and repetitive' (Interview #4). This opinion is corroborated by other Shenzhen inhabitants, who find the overall SBP design to lack quality (Interview #3). The limited connections between the park and the surrounding neighbourhood make SBP poorly accessible to users. Nevertheless, the recent establishment of a public transport station and the launch of an international comprehensive design competition have been carried out to upgrade,

reprogram, and redesign the whole SBP in the coming years. The winning design proposal aims to bring an ecological value to the park –restoring a mangrove wetland area– and to enhance its spectacular aspects linked to the creation of landscapes that will attract *Instagram* users: ‘they want their Instagram moments, you know, flashes of spectacular...’ (Interview #3). The winning design proposal aims to reconceptualize the landscape of the waterfront as a ‘collage’ with several themes and areas (Interview #3). The project may impact the character of the park, shaping it on the model of recent overseas cases.

KTP

The KTP is a 1-km-long waterfront public area facing the former Kai Tak airport redevelopment and the newly completed cruise terminal. This urban renewal operation followed the rezoning of the former industrial district of Kwun Tong as the city’s third central business district in 2001. The KTP is a government initiative under the Energizing Kowloon East Office (EKEO), designed by the Architectural Service Department and managed by the HKSAR Government’s Leisure and Cultural Service Department. The project comprised two phases, the 200-m pilot area adjacent to the existing Kwun Tong commercial district, opened in 2010, and an extension of 750 m adjacent to future residential development completed in 2015. Conceived as an open space of 3.4 hectares, phase two was built on a former cargo area decommissioned in 2011. It features a recreation zone with a boardwalk, a sitting-out area, and an open space with fitness stations. The transformation of Kwun Tong District from a manufacturing-based to a service-based economy influenced the design of the promenade, which aims to retain the district’s industrial heritage (Interview #5). Some design elements are repurposed industrial material (e.g. old drums are upcycled as perimetral railing; Interview #5). Although heavy industrial activities are still being conducted within the premises of KTP, the promenade mainly aims to attract families on holidays (Kwun Tong District Council, 2014)

through newly opened music fountains, interactive wet play areas, and an amenity lawn that would make KTP a leisure hot spot (HKSAR, 2021). Indeed, the KTP attracts users from all over Hong Kong who prefer to spend their leisure time outdoors and come with their families to play in the wet play areas during hot months (Interview #6).

DOM

Located in Williamsburg, Brooklyn, the DOM is part of a redevelopment project of the former Domino Sugar Refinery, which closed in 2004. Within 45 minutes travel from midtown Manhattan, the proximity to the city centre has made this waterfront site a crucial component of a real-estate operation carried out by the developer Two Trees Management, who purchased the disused industrial property for mixed-use redevelopment in 2012. Although the real estate properties are still under construction, DOM, positioned as a public park designed by James Corner, was opened in 2018. The linear park of 380 m is organized into three thematic zones: the ‘active recreation zone’, the ‘water square’, and the ‘passive recreation zone’. The park includes a dog park program, a flexible lawn, a volleyball court, and an ‘artefact walk’ that celebrates the industrial site’s heritage. The park can be interpreted as an attempt to create a sort of counter-space within the urban fabric. James Corner declared that post-industrial reclamations like the High Line are driven by the attempt ‘to theatricalise the everyday’ (Megson, 2017- Excerpted from Interview).

DOM is a well-aware attempt at a Baudrillardian (1996) Disneyesque exploitation of the historical attributes for real estate investing and city branding. Lisa Switkin, Senior Principal of James Corner Field Operations, declared: ‘The idea behind [the conservation of] things that were used to make and refine sugar, the idea was really to inspire a sense of wondering curiosity and also to create a real connection to the history of what was here’ (Bernal, 2018- Excerpted from Interview). Additionally, Corner emphasized the economic relevance of

these urban renewal operations from the perspective of feeding urban ‘economic machines’ with people: ‘Cities are economic machines, and they need people [...]. So they have to retain residents, businesses and tourists. Young people today have a choice. They could go and live in London or Chicago or Miami or Hong Kong, or Barcelona. So to keep them, you need public spaces that really appeal to them. We need to create desire’ (Megson, 2017- Excerpted from Interview). Against this backdrop, as put forward by Corner, landscape ‘encapsulates society, politics and our own existence on a planet where we’re bound by natural forces. It’s how we give form to our land and cities. Ultimately it’s how we identify with places’ (Megson, 2017- Excerpted from Interview). In contrast to the other green spaces in the neighbourhood, DOM ‘is attractive as a local option, resembles the Highline’. However, having ‘less trees, canopy, and nature than other parks, less organic growth... it’s mostly an intentional stopover when in the neighbourhood’ (Interview #7). Restrictions on bringing own drinks and food and design constraints are perceived as important limitations, making it ‘very inconvenient for people who want to organize a day in a park with friends’ (Interview #7).

Landscape: empirical analysis

Urban parks

Urban green space provision and design vary significantly in the four selected cities; Venice has the highest per-capita provision of green space (Table 1). Green urban areas acquired different functions through long city history (agriculture, decoration, leisure). The historical area of Venice (comprising the main islands of the lagoon) is punctuated with small private green spaces – courtyards and vegetable gardens – and large public urban parks accounting for about 2% of the urban area and providing crucial leisure space for the needs of inhabitants (Marzi, 1986). These vast green spaces are, in many cases, a Napoleonic legacy; they were conceived and constructed at the beginning of the nineteenth century under the

French occupation by demolishing and seizing public buildings as well as religious and private properties. Despite being public, most of the urban parks are fenced and guarded. The centrally located ones are often on tourist routes, while the peripheral ones serve the needs of the resident population.

Limited land supply in high-density urban environments such as Shenzhen challenges urban green spaces provision (Chen, Liu & Liu, 2016; You, 2016). The individual availability of green space in Shenzhen is 14.95 m², which is higher than the 9 m² recommended by the World Health Organization as the minimum per capita provision, but far from the ideal value of 50 m² per person (WHO, 2012). Green spaces are usually fenced and include several public grounds for recreation, culture, or heritage (Li et al., 2006). In line with Chinese tradition, they can be categorized into nature-dominant and architecture-dominant spaces (Li et al., 2006). These public open spaces of government provision are unequally distributed across the territory, with socioeconomically disadvantaged districts having more restricted access to urban parks (You, 2016).

Despite plentiful country parks, the availability of urban parks in Hong Kong is exceptionally scarce (the lowest among the four cities and one of the lowest worldwide), especially in the high-density urban areas of Kowloon and Hong Kong Island (Tang, 2017). Urban parks, particularly those with waterfront access, are more likely to be located near upmarket, low-density housing areas and commercial-business districts than high-density housing neighbourhoods (*idem*). Most of these spaces are relatively small in size and only partially planned to fulfil public recreation needs; a limited number of activities are permitted, often under the supervision of security staff. Recently, the HKSAR government has actively encouraged private-sector participation in place promotion and urban marketing through the production and management of privately owned publicly accessible spaces (Rossini & Yiu, 2020).

New York is quantitatively similar to Shenzhen in the provision of green space. Similar to Venice, the American city has a long tradition in park design and provision, with an outstanding legacy of green areas such as Central Park, Prospect Park, and Bryant Park, all planned in the mid-nineteen century. The most famous among them, Central Park, was planned as a large scale recreational green space by Fredrik Law Olstead and Calvin Vaux. The Department of Public Parks, a dedicated institutional body, managed, maintained, and improved the parks (Carr, 1989). Since the late 1900s, a progressive erosion of the public sector has increased private provision, ownership, and management of open spaces in the city (Cybriwsky, 1999). Overall, green spaces in New York show a geographically inequitable distribution (Maroko et al., 2009). Parks catering to wealthy consumers and tourists (e.g. the High Line and the Brooklyn waterfront greenway) are well kept to increase consumption, while parks catering to disadvantaged communities (e.g. immigrants) are neglected (Loughran, 2014).

Waterfront parks

< Table 2 here >

Descriptive statistics serve to illustrate the different distribution of landscape patches across the four case studies. The study areas of GDB and SBP strike a balance between non-vegetated surfaces and green areas. The GDB's long history is reflected in the extensive tree canopy and vegetated areas, where trees and shrubs have reached maturity. The two Asian waterfront parks have a similar percentage of soft surfaces whilst differing in the provision of other landscape patches. Eventually, the selected area of KTP is the most urban-looking, its impervious surfaces accounting for about 60% of the total area and the promenade offering a sizeable urban furniture presence. Noticeably, DOM performs quite differently from European

and Asian waterfront parks, being relatively well equipped with soft surfaces whilst having the smallest percentage of hard surfaces. Among them all, the area of DOM considered in this study is by far relatively the greenest (including all vegetated surfaces). Also, DOM and KTP are similar in the provision of shaded surfaces and built-up elements. These spatial characteristics are possibly ascribed to their recent completion (the tree canopy has not yet fully developed) and a more considerable investment of economic resources that allow a higher investment in maintenance.

Landscape: heterotopic sites?

< Figure 2 here >

Documentary analysis and seven in-depth interviews support identifying the selected waterfront parks as heterotopic sites. The four cases meet the six Foucauldian criteria, although in different ways: (1) belonging to different cultures and civilizations; (2) being synchronic with their embedding culture; (3) juxtaposing several incompatible sites in a single real place; (4) operating a break with traditional time either by accumulating it (KTP and DOM) or by an event-like transitory display (GDB and SBP); (5) partially filtering access (by poor connectivity and accessibility); and (6) being related to all the rest of the space as illusions (KTP and DOM) or compensations (GDB and SBP).

Using the Foucauldian theoretical prism, GDB and SBP can be interpreted as transient spaces of compensation. Contrariwise, KTP and DOM fall under a different category, namely time-accumulating spaces of illusion. GDB and SBP are similar in the materiality of their landscapes (Fig. 2), in their hosting fairground-type events, and in compensating dense urban areas: 'their role is to create a space that is other, another real space, as perfect, as meticulous, as well arranged as ours is messy, ill-constructed, and jumbled' (Foucault, 1986, p. 27).

Moreover, as ‘a kind of effectively enacted utopia’, these two sites ‘open up cities with vast avenues, [and] superbly planted gardens’ (Foucault, 2005, p. xix). Moreover, the case of GDB offers an illuminating account of the second Foucauldian criteria, perfectly representing the transmutation of the meaning of space from localization (medieval emplacement of the confined religious garden) to extension (the Galilean infinity of the Napoleonic boulevard), and finally to site (current condition of international exhibition ground).

Contrariwise, KTP and DOM accumulate time, repurposing their industrial history in a Baudrillardian theme-park simulacrum. These recent post-industrial regenerations of waterfront areas are driven by the will to boost a gentrification process in decayed districts through cultural commodification, and are also similar in terms of landscape patches (Fig. 2). Furthermore, all the considered cases contribute to the unequal qualitative distribution of green space across the four cities, possibly increasing urban spatial fragmentation and social polarization. As heterotopic sites, the waterfront parks *represent, contest, and invert* all the other sites (Foucault, 1986, p. 24). The grandeur of GDB’s boulevards counterposes the Venetian labyrinthic net of small alleys. The ecological richness of the SBP counterbalances Shenzhen’s unceasing *tabula rasa* urbanization. Analogously, the green KTP is a free-standing spot in an industrial grey field land, while DOM, a high-end safe pocket space, acts as a pioneering gentrifying element in one of New York’s lower-income boroughs.

Noticeably, there appears to be a parallelism between the nature and aspiration of the city and the type of heterotopia: both New York and Hong Kong are represented by time-accumulating spaces of illusion and Shenzhen, which aspire to be a global city, is currently restructuring SBP on such models to shape a thematic collage.

Users/uses: empirical analysis

This section introduces the demographic characteristics of the urban areas and the users of the urban parks in the four selected cities as emerging from secondary sources. Census data

were collected for the administrative unit of each study area (Table S2). Gender, age, ethnicity, and average household size information indicates comparable district-level compositions of the inhabitants living close to the four case studies. The gender compositions of the Venice and Hong Kong districts are similar, with more female than male inhabitants (52.36% and 53.44%, respectively). While the New York district shows a more balanced gender representation, with slightly more males than females (50.59%), the Shenzhen district has the highest percentage of male inhabitants (53.96%). The age profile shows polarising trends across the four cities districts. Venice has the highest majority of adults and seniors (40–79 years), followed by Hong Kong's district (55.83% and 50.23%, respectively). Shenzhen's district shows the highest percentage of young adults (20–39; 57.98%), New York's district shows the highest percentage of kids (21.18%) and a high percentage of young adults (42.92%). The ethnic composition varies for each city. New York's district is ethnically highly mixed, with 61.26% White, 24.95% Hispanic, and 6.56% Asian residents. Similarly, Venice has a variegated ethnical composition, with most of the non-Italian population (14.52% of the total population) coming from Europe (51.63%) and Asia (37.58%). Conversely, the ethnic compositions of Shenzhen and Hong Kong are more homogeneous, the majority being Chinese residents (97.74% Han Chinese and 96.10% Chinese, respectively). Finally, the average household size varies among the districts, ranging from 1.8 individuals in Venice to 2.8 in Hong Kong.

Urban parks

< Table 3 here >

Across all the cities considered, urban parks users were primarily male and were young adults or adults irrespective of gender (Table 3). Urban parks users' ethnicity, household, and habitual

companion characteristics were reported only in Mak and Jim (2019)'s study of Hong Kong, finding habitual users to be largely Chinese (87.5%), married (62.9%), and visiting the park in a group (62.6%). Reasons for visiting parks differ across the cities. In Italy, users reported using the urban parks for fun, relaxation, physical exercise, and observing nature (Marcheggiani et al., 2019; Ugolini et al., 2020). In Shenzhen, a recent study showed that reasons for visiting parks were childcare, playing cards, and sightseeing (Chen et al., 2016). The two most popular activities in Hong Kong parks were exercising and taking leisure walks (Mak & Jim, 2019; Wong, 2009), while in New York, it was playing with children, walking, and relaxing (Mak and Jim, 2019; Sonti et al., 2020; Wong, 2009).

Waterfront parks

< Figure 3 here >

< Table 4 here >

The gender, age and ethnicity information of waterfront park users were collected for the four case studies in Table 4. The gender composition of SBP, KTP, and DOM populations are similar, with more female than male users. In contrast, the GDB is the only waterfront park that displays slightly more male users than female ones (52.70%). The users' age profile shows similar trends across the four waterfront sites for the age group 0–14 (about 10% of total users) and 15–24 (about 10% of total users). GDB and DOM have the highest percentage of adults (25–44; 72.97% and 76.79% respectively), while SBP and KTP have fewer users in the same age group (60.58% and 55.17%, respectively). KTP shows the highest percentage of older users (44–64 and 65+), 19.40%. The users' ethnic composition varies for each park. DOM park's

users are ethnically highly mixed, with 51.19% White, 41.67% Black, 5.36% Hispanic, and 1.79% Asian users. A lower ethnic mix is observed in GDB, SBP, and KTP. In GDB, most of the users are European, 94.59%. In SBP, all the users are Chinese. Similarly, in KTP, most users are Chinese (92.24%) and 4.31% are Filipino (likely consisting of migrant domestic workers population).

< Table 5 here >

Descriptive statistics also show different activity intensities across the selected cases (Table 5). Low-intensity activities are predominant in all the selected waterfront parks, consistently over 60% of all observations, and reaching 83.33% of recorded behaviours in DOM. Moderate-intensity activities range from 16.66% (DOM) to 35.95% (SBP). Finally, high-intensity activities are relatively high in KTP, seldom found in SBP, and not present in GDB and DOM. Noticeably, the distribution of park users alone or in groups correlates with the differences in activity intensity. Overall, we found few low- and moderate-intensity users alone, reaching 19.96% and 30.58% of users, respectively. KTP performs differently in high-intensity activities, 64.52% of the high-intensity activities users alone in this study area. Despite the highlighted differences, the distribution pattern is quite similar across the four cases, and is almost identical in GDB and SBP. DOM users engage more in social interactions in low-intensity activities, whilst KTP exhibits a more significant portion of individual high-intensity activities. A deeper inquiry into the dataset sheds light on the group composition, which varies significantly across the study areas despite a similar average group size (Table 5). The percentage of families is the highest in SBP (71.05%), followed by KTP (61.40%), GDB (59.09%), and DOM (52.08%). Conversely, the proportion of friends is the highest in DOM and the smallest in SBP.

< Table 6 here >

Users/uses: heterotopic activities?

The second level of analysis sheds light on the difference in users/uses between urban parks and waterfront sites in the four case studies. Research has shown that most urban park users are males, while, except for GDB, most observed waterfront park users are females. Notably, we recorded a similar gender distribution for Venetian parks and the GDB different from the district composition. In Shenzhen and New York, urban park users and the district inhabitants show similar gender patterns different from those of the waterfront sites. Finally, in Hong Kong, the gender distribution found in KTP is similar to that of the district overall while differing from that typical of the urban parks. The findings may indicate that GDB is perceived as another Venetian park by the city inhabitants – as also emerged from in-depth interviews – while the other three waterfront sites are regarded as ‘other spaces’ than typical urban parks. Although the different categorizations do not allow a direct comparison for most cases, it is still possible to draw tentative inferences from collected data regarding age. Waterfront park users are younger than urban park users in all the case studies, and especially in Hong Kong. These findings are corroborated by information retrieved through in-depth interviews, reporting an increase of family users over other social groups: ‘Perhaps obviously, the presence of the older people is a little different, in the sense that the older people, obviously, in this year [of pandemic], have dramatically reduced their presence outside or at least limiting their movements’ (Interview #1).

Remarkably, the findings corroborate the assumption that users were local in the course of data collection due to the COVID-19 pandemic travel restrictions: with few exceptions, the ethnic compositions of the users’ populations resemble those of the embedding districts (See Table 4, Table S2). The absence of Asian users in GDB and their low presence in DOM, as well as the large portion of Black people in the American case, may be ascribed to particular

conditions (e.g. the Asian population in Venice is typically an economically active population with relatively low availability of leisure time on weekdays). Moreover, it falls outside the scope of this study to engage in ethnographic disquisitions, the ethnic data serving only to validate the posited COVID-19-related assumptions. On a different account, the waterfront park uses partially resemble the preferred urban park uses that emerged from the literature. In Venice, park activities are medium-intensity and individual-oriented; they are low-intensity and social-oriented in Shenzhen; medium/high-intensity and individual-oriented in Hong Kong; and medium-low-intensity and social-oriented in New York. However, unlike other urban parks, waterfront park activities were predominantly low-intensity and social-oriented, especially in DOM. These findings may be interpreted in light of the design constraints of the four waterfront sites, where aesthetic choices often prioritize symbolic or decorative elements over usability (Interview #6). Finally, the typological difference between transient spaces of compensation and time-accumulating spaces of illusion appears to have no impact on the users/uses of the four waterfront parks.

Landscape and users/uses: statistical analysis

The following sections report the findings related to the characteristics of the activities and their relationship with the spatial features of the studied areas, as illustrated in Figure 2. As proposed by Lefebvre, ‘The description of isotopies and heterotopies goes hand in hand with the analysis of the acts and situations of these subjects and their relation to objects populating the urban space.’ Subsequently, this third level of analysis inquires the association between landscape features and users’ activities.

Activity intensity by spatial features

Pearson’s chi-squared test was employed to analyze the independence of the categorical variables *activity intensity type* and *surface type*. The following conventions are used for the

interpretation of the association: ‘small’, ‘medium’, and ‘large’ were used for values of Cramer’s V of 0.1, 0.3, and 0.5, respectively (Cohen, 1988). The test was performed for the total sample and each case study. Results highlight a significant statistical association between activity intensity and surfaces for all the cases (Table 7). Overall, a moderate association is found for the total sample. The association between activity intensity and surfaces is noticeably strong in GDB and DOM, and moderate in SBP and KTP.

< Table 7 here >

The in-depth analysis demonstrates that moderate-intensity activities and hard surfaces contributed the most to the Chi-square statistics (Fig. 4, see Table S3). The contribution of these two categories is found to be particularly strong in SBP and DOM. However, in SBP, the difference between observed and expected counts is also notable for soft surfaces and built-up elements in low- and moderate-intensity activities. In SBP, vegetation is observed to have statistically significant associations with high-intensity activities. Low- and moderate-intensity activities accounted for the most considerable contribution in the association between waterfront park uses and surfaces in the KTP. Despite the relatively small sample size ($N = 810$), owing to the high significance ($p < 0.001$), it is safe to posit that there is a strong relationship between low- and moderate-intensity activities and hard and soft surfaces across all four cases.

< Figure 4 here >

Landscape and users/uses: heterotopic discourses?

The chi-square test showed a strong relationship between the categorical variables, indicating a notable difference between expected and observed distributions, supporting the existence of a gap between the designated functions and actual use of the waterfront spaces. The analysis also spotted different performances between transient spaces of compensation and time-accumulating spaces of illusion with built-up elements (i.e., urban furniture) having a greater impact on the first of the two categories. Despite the assumption of an intentional equal quantitative distribution of surfaces according to a designated activity intensity type being possibly questionable, still, the chi-square test sheds light on an uneven clustering of activities on different surfaces, potentially highlighting the imperfect fitting of space and behaviours. Notably, moderate-intensity, exertive physical activities are those with the most unexpected distribution across surfaces. Inference can be made on the deliberate and active appropriation of contemplative spaces. These results reveal the value of Frederick Law Olmsted's categorization of activities into *receptive* and *exertive* types for the design and study of (waterfront) parks. Moreover, the findings highlight the benefit of enlarging the semantic range of the notion of heterotopia to the meaning proposed by Lefebvre, as suggested by Sacco et al. (2019). The practice of everyday citizenship (Butler, 2012), which exercises the re-appropriation of the right to the city, is corroborated by statistical evidence and in-depth interviews. The COVID-19 pandemic may have stimulated the process of reclamation by citizens, particularly 'younger people, who see in these spaces, places of aggregation that have been denied [during lockdown]' (Interview #1). Therefore, the intrinsic exceptionality embedded within the Foucauldian conception ('some of the most spectacular buildings and skyline in Shenzhen along this park... If my friends or family members come to Shenzhen for the first time, I usually take them to this park' (Interview #3) – leaves space for the commoning practice of everyday life – 'it is close to where we live, kids can run, and parents can drink a beer' (Interview #6). Remarkably, low- and moderate-intensity social-oriented activities,

which account for nearly 80% of the observations (77.03% in GDB, 77.98% in SBP, 64.66% in KTP, and 76.78% in DOM), are those that contribute the most to the relationship between uses and space, possibly denoting a conscious collective attempt to sabotage the heterotopic machine. Indeed, the analysis of the situated dynamics of cultural and political appropriation of heterotopias showed heterotopic (misplaced) uses of heterotopic spaces.

Discussion

This paper established a new methodological framework to test the application of a Foucauldian concept in studying the production and use of waterfront parks. The COVID-19 pandemic fostered particular conditions in which users were primarily local, highlighting a gap between the projection of international design ideas into culturally rich, socially diverse urban districts and the final users' interpretations of the projected space. The merit of this work lies in the originality of the research design, which employs mixed methods to bridge the conceptual propositions of heterotopias proposed by Foucault and Lefebvre. Moreover, this study brings to the fore the urgency for a radical rethinking of the design of waterfront parks based on a post-pandemic scenario with changed users and uses. In this historical phase, heterotopias may have to integrate into the urban spatial and social fabrics, giving way to effectively enacted utopias.

Due to the limited geographic and cultural range of analysis, inferences regarding the equivalence between the waterfront park and the heterotopia cannot be drawn. However, we attempt to advance the view that a waterfront park may function as heterotopia only when it is a site. In the case of extensive waterfront developments that do not function as sites but as infrastructures (e.g. Vancouver waterfront promenade network), the notion of 'armature' (Shane, 2005) seems a much better fit.

Limitations

This study is not free from limitations. The choice of cases and data collected – hampered by COVID-19 restrictions – could have been more comprehensive to better account for a vaster geographic and temporal coverage. Intrinsic limitations in data collection hinder drawing strong inferences, particularly in the case of Venice. Remarkably, COVID-19 caused ‘distortions in the use of public space’ (Interview #1) that may undermine the comparative analysis of patterns of use in urban parks and waterfront sites. Specifically, the transformation concerned new dynamics in the use of public space beyond mere international mobility restrictions. Moreover, limitations in sample sizes and studied areas hindered the possibility of in-depth scrutiny of the association between landscape features and users’ activities. Nevertheless, this study’s primary aim is not to offer an evidence-based account of the waterfront park users/uses; rather, it is the definition of a novel analytical protocol for analyzing heterotopic sites. Subsequently, unavoidable limitations in the empirical component of the analysis are deemed acceptable within the scope of this study. Further research may use the same framework with an enlarged number of cases and users or propose a longitudinal study on the same four cases.

Conclusion

This study investigated the notion of heterotopia as applied to the interpretation of contemporary waterfront parks by proposing a new mixed-method approach and testing it on four case studies in global cities worldwide. The research design aimed to bridge the Foucauldian and Lefebvrian conceptualizations of heterotopia. The first phase of the investigation followed Foucault’s original prescription (systematic description), offering an in-depth understanding of the original design intention of the four selected cases. The second and third phases comparatively examined the difference between urban parks and the selected waterfront park within the same city; the second phase focused on landscape features whilst

the third on users/uses. The last phase of the investigation adopted a statistical hypothesis test for eliciting the association between space and uses. COVID-19 travel restrictions impacted the users of waterfront parks during data collection, resulting in a locally limited catchment area and a significant gap between (designer) expected and actual uses.

The results shed light on the production and uses of waterfront parks and demonstrated the feasibility of the proposed methodological protocol. Furthermore, they provided a solid ground for arguing that some of the most notorious waterfront parks in global cities are conceived as heterotopic sites, either as transient spaces of compensation or time-accumulating spaces of illusion. These heterotopic sites function as simulation apparatuses that provide ‘flashes of spectacular’ (Interview #3) and intend ‘to theatricalise the everyday’ (Megson, 2017- Excerpted from Interview). Despite the promoters’ intentions, users seem to reject the role of extras in contemporary Baudrillardian simulacra and exercise the right to their cities; in most cases, waterfront parks’ users and uses are found to be aligned with those of other urban parks. Moreover, time may also play a crucial role in how the sites are perceived; only the recently completed waterfront parks are regarded by users as ‘other spaces’ than typical urban parks.

The highlighted unresolved tension between strategies of production of heterotopias and reclamation of spaces for socialization contributes to the making of places in the global city during pandemic travel restrictions. Although the pandemic context is possibly transitory, it may still impact the use of public spaces for quite some time. Situating the design of waterfront parks in the local cultural and social contexts will reveal crucial for providing sensitive responses to end-users. Such a response should consider the exertive needs of users and prioritize usability over the employment of symbolic or decorative elements finalized to receptive uses. Thus, this study may serve as a reference to those concerned with the production of waterfront parks in the global city. Users voice their demand for less scenographic and more

integrated, accessible, comfortable, and usable spaces: ‘More space, more nature, less rules!’ (Interview #7).

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Table 1. Key geographic, environmental, and data recordings characteristics of the four case studies.

City	Geographic context		Case study data collection					
	City ID	Green space (m ² per capita)	Case ID	Date	Time	Temperature [C]	Humidity [%]	Heat index
Venice, Italy	VCE	26.5	GDB	6/8/20	13.57	27	58	28
Shenzhen, China	SZX	14.95	SBP	26/9/20	17.16	28	73	31
Hong Kong, China	HKG	2.66	KTP	4/10/20	17.48	29	74	33
New York, USA	NYC	13.6	DOM	2/8/20	18.00	31	63	36

Sources: Venice data are based on EEA (European Environment Agency) publicly accessible green space at the provincial level. Shenzhen data are based on (http://cgj.sz.gov.cn/sjfb/content/post_7953288.html). Hong Kong data are based on secondary data Hong Kong Council of Social Service (2021). New York City data based on Open Street Map and U.S. Census (available at <https://www.geotab.com/urban-footprint/>).

Table 2. Landscape patches: descriptive statistics

Type	Material	GDB		SBP		KTP		DOM	
		[m ²]	[%]	[m ²]	[%]	[m ²]	[%]	[m ²]	[%]
Study area		15370.82	25.62	5476.11	0.51	7205.99	17.16	1915.32	7.84
Hard surface		7474.85	48.63	2482.15	45.33	4249.95	58.98	538.66	28.12
	Wood	0	–	0	0	1653.2	22.94	0	–
	Stone	134.27	0.87	2482.15	45.33	2415.76	33.52	538.66	28.12
	Gravel	7340.58	47.76	0	0	0	–	0	–
	Rubber	0	–	0	0	180.99	2.51	0	–
Soft surface		2145.24	13.96	1642.64	30	2023.40	28.08	1164.52	60.80
	Sand	0	–	0	–	0	–	348.73	18.21
	Water	0	–	74.29	1.36	0	–	0	–
Vegetation	Grass	2145.24	13.96	1568.35	28.64	2023.40	28.08	815.79	42.59
	Shrub	5369.62	34.93	1345.31	24.57	545.37	7.56	164.61	8.59
	Tree coverage	2019.75	13.14	195.95	3.58	64.16	0.89	12.96	0.68
Built-up		3349.87	21.79	1149.37	20.99	481.22	6.68	151.65	7.92
	Furniture	436.99	2.84	25.06	0.46	455.47	6.32	58.20	3.04
	Building	123.51	0.8	25.06	0.46	455.47	6.32	58.20	3.04
		313.48	2.04	0	–	0	–	0	–

Table 3. Park users' socio-demographic characteristics

					VEN	SZX	HKG	NYC
Gender [%]								
	Male				55	53	55.2	58
	Female				45	47	44.8	42
Age [%]								
	VCE	SZX*	HKG	NYC				
	0-18	10-19	18-24	Adults	15.5	6.11	13.7	84
	19-30	20-29	25-34		50	37.77	19.2	
	31-50	30-39	35-44		20	26.77	24.8	
	50+	40-49	45-54		14.5	18.61	10.8	
		50-59	55-64	Seniors		6.61	13.2	16
		60+	65+			3.86	18.3	

Sources: VEN (Marcheggiani et al., 2019), SHX (Yang, 2016)*reported data are average of original data and do not add up to 100% , HKG (Mak & Jim, 2019; Wong, 2009) , NYC (Sonti et al., 2020)

Table 4. Waterfront park users' socio-demographic characteristics.

	GDB		SBP		KTP		DOM	
	[N]	[%]	[N]	[%]	[N]	[%]	[N]	[%]
Male	39	52.70	159	46.09	106	45.69	69	41.07
Female	35	47.30	186	53.91	126	54.31	99	58.93
Age								
0-14	8	10.81	44	12.75	36	15.52	16	9.52
15-24	10	13.51	60	17.39	23	9.91	17	10.12
25-44	54	72.97	209	60.58	128	55.17	129	76.79
45-64	2	2.70	26	7.54	39	16.81	6	3.57
65+	0	0.00	6	1.74	6	2.59	0	0.00
Ethnicity								
Europe	94.59		Chinese	100.00	Chinese	92.24	White	51.19
Asia					Filipino	4.31	Black	41.67
Africa	1.35				Indonesian	1.29	Native	
America	4.05				White	1.29	Asian	1.79
Oceania					Indian		Islander	
					Nepalese	0.86	Other	
					Pakistani		Two +	
					Thai		Hispanic	5.36
					Japanese			
					Other Asian			
					Others			

Table 5. Activity intensity and social engagement across cases.

Activities	Type	GDB		SBP		KTP		DOM	
		[N]	[%]	[N]	[%]	[N]	[%]	[N]	[%]
Low intensity		50	67.57	216	62.61	140	60.35	140	83.33
	indv.	13	17.57	47	13.62	26	11.21	23	13.69
	grp.	37	50	169	48.99	114	49.14	117	69.64
Moderate intensity		24	32.44	124	35.95	66	28.45	28	16.66
	indv.	4	5.41	24	6.96	30	12.93	16	9.52
	grp.	20	27.03	100	28.99	36	15.52	12	7.14
High intensity		0	0.00	5	1.45	26	11.21	0	0.00
	indv.	0	0.00	0	0.00	20	8.62	0	0.00
	grp.	0	0.00	5	1.45	6	2.59	0	0.00

Table 6. Group types: breakdown.

	GDB	SBP	KTP	DOM
Users in groups [N]	57	274	156	133
Users in groups [%]	77.03	79.42	67.24	79.17
Groups (Tot.) [N]	22	114	57	48
Families [N]	13	81	35	25
Families [%]	59.09	71.05	61.40	52.08
Friends [N]	9	33	22	23

Friends [%]	40.91	28.95	38.60	47.92
Min components [N]	2	2	2	2
Max components [N]	5	8	7	8
Mean size of group [N]	2.89	2.74	3.33	3.36
SD [N]	1.02	1.31	1.60	1.68
Total observations [N]	74	345	232	168

Table 7. Relationship between activity intensity (Low to High) and design surfaces per park. Chi-square test.

	Surface
Total	0.408***
GDB	0.720***
SBP	0.471***
KTP	0.430***
DOM	0.653***

*** indicates $p < 0.001$, ** indicates $p < 0.01$; * indicates $p < 0.05$

Figure Captions:

Figure 1. Research design: in grey, first-hand environment/behaviour data collection; dotted line, analysis on three levels.

Figure 2. Landscape patches across the four cases. N.B.: Vegetation is represented broken down into the two components of shrubs and tree coverage.

Figure 3. Dot distribution maps of low, moderate, and high-intensity activities across the four case studies

Figure 4. Variables' contribution to the chi-square statistic. Each cell's contribution value is equal to the square of the difference between the observed and expected values, divided by the latter.