

# Mapping Neighbourhood Outdoor Activities Space, Time, Gender, and Age

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## Abstract

This paper investigates spatial, temporal, age, and gender pattern of outdoor social activities in urban neighbourhoods and their correlation with properties of urban form. Informed by theories and mapping techniques in urban sociology, urban design, and behavioural research, it develops a methodology for mapping outdoor social activities and applies it to four case studies in London and Berlin. Findings demonstrate how different types of activities are spatially distributed, reflecting socio-spatial characteristics of the given neighbourhood. The paper elaborates the contribution of the research to ongoing debates such as gendered space and age-friendly communities and suggests methodological improvements for future research.

## Introduction

It has been widely claimed that compact urban form promotes social life and liveability within the public urban areas and outdoor spaces, and thus enhances social sustainability of communities. These claims include higher sense of safety, intense social interactions, frequent outdoor exchange, reduced social segregation, higher feeling of environmental quality, and lower violence, to name but a few (Jenks 2017; Aquino and Gainza 2014; Raman 2010; Jacobs 2000). However, scholars call for more scientific investigations and empirical evidence from across the globe in order to gain a fine-tuned understanding from the relationship between compact urban form and urban social sustainability (Jenks 2009; Burgess 2000).

This paper is part of a much larger project on social sustainability of compact neighbourhoods in two cities of London and Berlin, which aimed to contribute to the abovementioned scientific lacuna. Besides suggesting a conceptual framework for socially sustainable neighbourhoods, proposing an evaluation framework for measuring social sustainability indicators, and applying it to four neighbourhoods in London and Berlin, the project targeted to analyse social activities that take place at the outdoor spaces of the neighbourhood, and investigate their association with characteristics of urban form. This paper presents results of the mapping neighbourhood outdoor social activities. The main questions addressed included: What are typologies of outdoor social activities? How are these typologies spatially distributed? How are these activities correlated with different characteristics of urban form such as land use and street layout? What are the gender and age specifications of outdoor social activities? Is there any social logic behind spatial distribution of activities? And finally, what is the temporal pattern of these activities?

This paper sets out to empirically examine nature, character, and type of outdoor social activities, investigate their spatial pattern and configuration, and more importantly develop a methodology for mapping and analysing them. It first introduces theoretical and practical foundations of the methodology developed for mapping outdoor social activities. After a short introduction to four case study neighbourhoods in London and Berlin, the paper analyses and discusses typological, temporal, gender, and age patterns of outdoor social activities in the case study neighbourhoods and their spatial configurations. It concludes with research and practice implications of the findings and suggests some methodological improvements for future research.

### **Space, Society and Mapping**

In this study, the methodology, analysis and discussion regarding mapping outdoor social activity is built on three theoretical observations: space-society dichotomy, significance of outdoor activities, and mapping as a method of inquiry. An exhaustive discussion on these three topics would be beyond the confines of the paper. However, a review of the key theoretical observations would set the ground for the proposed methodology and following discussions and analysis.

The interaction and relationship between society and space in the urban planning discipline has been debated under the idea of environmental determinism or architectural determinism: the idea that to what extent individual and collective social behaviour is determined by the geographical or physical characteristics of the built environment and vice versa (Hillier 1996; Lang 1987). As Hanson and Hillier (1987) put it, debates on the relationship between spatial form and social activity have been oscillated between two arguments of correspondence and non-correspondence. While non-correspondence argument sees social grouping to a great degree independent from territorial demarcation, correspondence argument finds them structurally and fundamentally interlinked and interrelated.

Hillier et al. (1987) suggest a mediatory position where spatial configuration of the built environment only establishes a potential field of probabilistic co-presence and encounter. Hillier further explains that “the determinable effects of spatial form on people are both limited and precise. Spatial form, I argue, creates the *field of probable*— though not *all possible* – *encounter and co-presence within which we live and move*; and whether or not it leads to social interaction, this field is *in itself an important sociological and psychological resource*” (Hillier 1989, 13; original emphasis). In this sense, spatial layout only provides or precludes opportunities for interaction and socialisation, but does not cause such interaction to occur. This approach frees us from the deterministic approach and makes the question of interaction between space and society an area of scrutiny and empirical investigation.

Within the broader debates on the dialectics of space-society, outdoor spaces have been considered as one of the possible arenas for such interaction and hence as significant places for socialising and social activities. Gehl in his seminal works (Gehl 2011; Gehl 2010) underlines the importance of the life between buildings, and investigates the interaction between the physical environment and different activities that take place in outdoor public spaces. He also discusses basic outdoor activities such as walking, standing, sitting, seeing, hearing, and talking, and their spatial characteristics. The pattern of socialising, however, has been remarkably changed as the result of the modern life. As Oldenburg (1982) puts it, modern life has been increasingly narrowed down arenas of daily social engagement to two-stop model of home and workplace (office, shop, etc.), so that people have jobs and homes and very little in-between. To deconstruct the abovementioned two-stop model of existence, utilising places outside the workplace and home as potential arenas for social engagement becomes significant. These arenas, referred to as ‘third places’, play a vital role in promoting

social interaction and public engagement (Memarovic et al. 2014; Hickman 2013; Oldenberg 2007). This implies that it is extremely important to gain a better understanding from the nature, patterns, and dynamics of outdoor social activities. Mapping as a tool and method of inquiry helps us to obtain such an understanding.

Mapping practice and analysis, as a “spatial form of knowledge” (Harley 2001, 78), has gained growing recognition in both academia and everyday life (Roberts 2012). In academia, exploratory nature of mapping has been extensively used in many disciplines such as cultural and social studies, ethnography, geography, and urban planning, in order to investigate spatiality of the subject in question. Methods developed for behavioural mapping (Marušić 2016; Marušić 2011; Cosco, Moore, and Islam 2010), along with observation techniques utilised in sociology, urban ethnography, and urban design (Denzin 2017; Al-Sayed et al. 2014; Gehl 2010; Gehl 2011; Whyte 1980), informed with recent advances in GIS and ArcMap for data processing (Kytta et al. 2016; Ye and van Nes 2014; Coulton, Chan, and Mikelbank 2011; Schaick and Spek 2008), provide researchers with an efficient tool to map spatiality of social practices and activities in the built environment and dig into the space-society interaction. While behavioural mapping and observation techniques help us to study the environment-behaviour relationship, explore the distribution of behaviours throughout the place, and record the location and activity of subjects, GIS databases serve as an inventory tool to code multitude variables, process large data, and run multiple and integrated queries to gain in-depth and comprehensive knowledge about different activities in space.

These three theoretical notes pave the way towards developing an appropriate methodology through which the questions this paper raised in the introduction could be addressed.

## **Methodology**

To map outdoor social activities, it is necessary to develop a comprehensive methodology which address two key subjects: outdoor social activity, and mapping method. The question of outdoor social activity is about the space of activity (territorial realm in which social activities are investigated), the type of activity, and the gender and age of the actor. The mapping method aspect defines techniques of observation and the way collected data are being processed.

Informed by the literature and previous studies (Gehl 2010; Gehl 2011; Whyte 1980) and in accordance with the goals of the research mentioned above, this study defined outdoor spaces as areas within neighbourhood boundaries visible for the observer while passing through the publicly available routes and spaces. This included public and semi-public spaces such as streets, parks, communal gardens, and driveways. Every single case of outdoor social activity was conceptualised as an ‘incident’: a person of a certain gender and age doing a specific type of activity. Each incident contains three properties: type of activity, gender, and age. This was recorded as a three-component code of XYZ; X shows the activity type, Y refers to the gender, and Z indicates age of the actor. For the purpose of this research, drawing on Gehl (2011; Gehl 2010), following activity types were identified which normally take place at outdoor spaces: Walking (W), Sitting (S), Standing (I), Playing (P), Conversation (C), Cycling (Y), Running (R), and Fixing (F), the latter including different activities such as fixing a car, gardening, or cleaning. This approach to activity types is not perfect and in practice faces challenge of cross-categorisation, for example doing a conversation while standing or sitting. To address this, the observer recorded what seemed to be the main type of the activity; the incident of two walking gentlemen who talk to each other was mapped as Walking, while the incident of three teenagers talking together while waiting for a bus at the bus station was mapped as Sitting. In some categories such as Cycling it was not possible to map the purpose of the activity. For example, all the Cycling cases showed the activity

regardless of the purpose which could be leisure, commuting to work, etc. Moreover, the type of activity may change frequently so that one may run to a café then sit outside for a drink and then walk back to home. In this research, activities were mapped at the time of observation. Gender was recorded as F for female and M for male. Since practically it was not possible to ask for the exact age of the observed people, only four main age groups were considered: persons up to 9 years (mainly infants and children) were coded as C, people aged 10-17 (mainly adolescent and teenagers) as T, people aged 18 - 70 (adults) as A, and people over 70 (elderly) as E. This age grouping helped the researcher to understand age difference in social activity types. Thus, an incident of a walking female adult was coded as WFA, a cycling boy who was teenager as YMT.

Temporal attributes and differences of outdoor social activities have both seasonal and weekly/daily specifications. Seasonality of outdoor activities implies that climate and weather conditions play a vital role in the intensity and diversity of outdoor activities (Tucker and Gilliland 2007; Biddle and Mutrie 2007; Merrill et al. 2005; Baranowski et al. 1993). Weekly/daily specifications of outdoor activities refer to different patterns of activities in different days of a week, and to the fluctuation of activity intensity over a single day from early morning to evening. To avoid any distraction because of the weather, observation was conducted in non-rainy days, non-winter period, with a comfortable temperature that allows different types of activities such as playing, running, and sitting outside. London cases were observed in late September and early October 2015, Berlin cases were observed in March and April 2016. Data collection and observation was conducted on a weekday – Tuesday, Wednesday, or Thursday – and a Saturday. Following Al-Sayed et al. (2014), empirical studies suggest that Mondays and Fridays show a different pattern of activities than other weekdays, and should be excluded. Overall, taking into account methodological restrictions of the proposed mapping method, such as activity cross-categorisation, and logistic restrictions such as limited observation days and not addressing seasonal differences, the results of the mapping should be considered as partial and not comprehensive, but representative.

The observer followed a pre-defined path which covered all the major routes of the neighbourhood. A booklet of detailed maps printed on A4 pages enabled the observer to localise every single incident with high precision. One complete observation round took place in each time-slot of 8am-10am, 10am-12 noon, 12noon-2pm, 2pm-4pm, and 4pm-6pm. Activities observable in the immediate surrounding of the observer were recorded on the relevant sheet using the defined codes, so that each time-slot was mapped on a separate booklet. The collected data were processed by ArcMap. Data sets were organised following a day and time-order structure. This created a rich database of observations that enabled running complex and multiple enquiries based on activity type, gender, and age for weekdays and the weekend. In total, 27800 incidents were mapped and processed.

As noted earlier, the study presented here is part of a larger project for which a household survey was conducted to investigate different social sustainability indicators. In this paper, when needed, the results of the household survey are utilised to explain and analyse results of the mapping study.

### **Case study Neighbourhoods: A general profile**

The case study area in Kilburn (size: 17 ha, population: 3,411) is located in the London Borough of Camden (see Fig. 1). 21 per cent of the plots are mixed use, mainly concentrated along with Kilburn High Road. Laid out over a connected network of Victorian streets, the area is well-connected to the city through the Kilburn High Road and served by different types of public transportation (over-ground, under-ground, and bus services). The majority of



the buildings are flats (83 per cent). Bethnal Green case study (size: 35.7 ha, population: 6,815) is located in the London Borough of Tower Hamlet (see Fig. 1). It accommodates a number of residential estates built in different periods after the Second World War. 17 per cent of the plots are mixed use. The area is well served by the public transportation including over-ground, under-ground, and bus services.

### Fig. 1 Here: Case study neighbourhoods (author)

The case study area of Samariterkiez (size: 49.5 ha, population: 13,853) is located in East Berlin, Friedrichshain district (see Fig. 1). 73 per cent of plots are mixed use, scattered across the neighbourhood. The study area has been developed following a gridiron-like urban pattern; public transportation is available within walking distance including over-ground (S-Bahn), under-ground (U-Bahn), tram, and bus services. Almost all of the residential units are flats, located in mainly 5-6 storey buildings. Klausenerplatz case study (size: 55.2 ha, population: 13,668) is located in the western part of Berlin, district of Charlottenburg. 60 per cent of plots are mixed use. Urban layout follows a gridiron-like pattern, with mainly 5-6 storey buildings divided into flats. Inhabitants have access to different public transportation means such as U-Bahn in the south, S-Bahn in the west, and bus services which cross north, east and west boundaries of the neighbourhood.

## Outdoor social activity: Analysis and discussion

### *Patterns of outdoor social activity*

Table 1 shows distribution of activities during the weekdays and weekend. While in Bethnal Green and Klausenerplatz there is no significant difference during the weekday and weekend, in Kilburn and Samariterkiez the difference is considerable. Kilburn High Road with a high concentration of commercial land uses serves as a regional hub for shopping and attracts people from the surrounding areas, and this could be the reason for higher number of activities during the weekend. In Samariterkiez, the number of activities is 10 per cent less at the weekend than the weekday, which could reflect the family-oriented structure of the neighbourhood so that families spend their time either at home or outside the neighbourhood space.

Delimiting the analysis to the total number of activities, however, would be misleading, as the size and population of case study neighbourhoods are different. For comparative purposes, two concepts of 'population density of activities' (number of activity per person) and 'area density of activity' (number of activity per hectare) would be helpful. As Table 1 suggests, Kilburn has the highest population and area density of activities, which implies that despite small size and population, it accommodates more activities within the neighbourhood space. On average, population and area density of activities are higher in London neighbourhoods than Berlin ones. This is due to what could be referred to as 'High Street Effect.' Studies have shown that high streets across the UK, in many cases, serve as places of super-diversity, multiculturalism, ethnic minority retails, independent small shops, chain stores, and multiple forms of sociality (Vaughan 2015; Hall 2015; Hall 2011; Griffiths et al. 2008; Guy 1998). Despite recent threat by online shopping, e-commerce, out of town retail outlets, and the global economic crisis (Dixon and Marston 2002), high streets keep functioning as a socio-cultural and economic hub, and thus attract outdoor activities, accommodate them, and leave adjacent urban spaces less crowded and active. In a recent book (see: Vaughan 2015), authors have studied the shifting diversity pattern of London high streets over time, and analysed the significance of high street as an arena of communal identity, economic topography, and socio-cultural activity.

### Table 1 Here: Distribution of activities (author)

*Typological pattern of activities:* Typological pattern of activities studies distribution and intensity of activities by type (Table 2). Walking, as expected, is by far the dominant activity in all the neighbourhoods. This suggests that neighbourhood space is predominantly used for movement and mobility purposes; other activities are remarkably overshadowed by Walking. Difference in the level of Walking dominance between cities and neighbourhoods, however, is meaningful and indicative of socio-spatial differences. As London neighbourhoods have higher percentage of Walking activities than Berlin cases, this indicates that Berlin neighbourhoods accommodate more non-Walking, static activities than London neighbourhoods. Standing has the second place in Kilburn (16.1 per cent), Bethnal Green (12.9 per cent), and Klausenerplatz (16.1 per cent), while in Samariterkiez Cycling (13.68 per cent) occupies the second place. Site observation suggests that higher number of Standing activities are not necessarily the result of stopping and chatting, but take place around some specific areas such as bus stations and behind traffic lights where people have to wait. What appears remarkable is the higher intensity of Sitting, Cycling, and Playing activities across Berlin neighbourhoods compared to London neighbourhoods. This indicates that Berlin neighbourhoods are more comfortable places for cycling, provide spaces for sitting, and have safer locations for children and teenagers to play. Analysis of the spatial pattern of activities (see: spatial pattern of outdoor activities) will clarify reasons behind these differences. Overall, it could be said that the neighbourhood space is predominantly a space for moving/walking; activities which involve socialising and exchange are only a small part of the outdoor activities.

**Table 2 Here: Typological pattern of activities (author)**

*Temporal pattern of activities:* Temporal pattern of activities shows the fluctuation of activity intensity over time and explains how typology of activities is temporally bounded (Fig. 2 and Fig. 3). Overall, in both weekdays and the weekend, all the neighbourhoods follow a similar temporal pattern of activity. During the weekdays, intensity of activities grows and reaches its zenith in the afternoon. In the case of Bethnal Green, higher intensity of activity in the early morning (8-10am) compared to other cases is because of five large schools in the area (one Nursery School, one Primary School, one Secondary School, one Lower School, and one Special School), as the result of which one observes a crowd of students going to secondary schools, or parents taking children to nursery and primary schools. At the weekend, activity pattern is quite different than weekday in the sense that the number of activities is quite low in the early morning but remarkably rises up, reaching its zenith in the noon or afternoon.

**Fig. 2 Here: Temporal pattern of activities – weekdays (author)**

**Fig. 3 Here: Temporal pattern of activities – weekend (author)**

*Gender pattern of activities:* Gender pattern of activities explores gender differences in using neighbourhood space. This helps us to understand whether and to what extent typologies of activities are associated with gender, and how the neighbourhood space favours gender equity. As Table 3 depicts, there is a gender difference in outdoor activities, though this difference is not significant. Only in Kilburn female activities are higher than male activities (2 per cent). Bethnal Green has the highest gender difference; male activities are 16 per cent higher than female activities. This may reflect the socio-cultural structure of the Bethnal Green area (33 per cent Bangladeshis) which may suggest less presence of female inhabitants on the public space, and familial structure of the community with strong role of female inhabitants in the households, as the study by Dench and colleagues underlines (Dench, Gavron, and Young 2006). This gender difference, however, as will be illustrated later (see:

spatial pattern of outdoor activities), does not mean an obvious spatial segregation of gender in the public space.

**Table 3 Here: Gender pattern of activities during weekday and weekend (author)**

Overall, female activities during the weekdays are higher than weekend, but male activities are more intensive at the weekend. This may indicate that female inhabitants have more time during the weekdays to use neighbourhood space, but concentrate on household activities during the weekend, while male inhabitants have more free time during the weekend to spend at the neighbourhood area.

Table 4 provides a different perspective to the gender pattern of activities from the activity type point of view. Generally speaking, there is no significant gender difference in Walking, Sitting, and Standing activities, but in Playing, Cycling and Fixing. Cycling appears the most gender-oriented activity and deserves a closer investigation. While in London neighbourhoods there is a significant gender difference in Cycling and this activity is male-dominated (male cycling is 48 and 42 per cent higher than female cycling in Kilburn and Bethnal Green respectively), in Berlin cases male dominance is only 10 per cent in Samariterkiez and 6 per cent in Klausenerplatz. Berlin case studies benefit from extensive traffic-calming measurements and designated cycling routes across the neighbourhood, what London cases lack, and this makes cycling in London less safe and attractive for female cyclists. Pucher and Buehler (2008) show how policy change in Germany after the mid 70s advocated provision of separate cycling facilities, which combined with traffic calming of the residential neighbourhoods made cycling a safe transportation mode. Other research studies and official statistics also confirm that in London Cycling is remarkably gendered. For example, in England during 2014-2016 males aged over 5 made about three times as many cycle trips as females (27 as opposed to 9 for females), and cycled around four times as many miles as females (87 as opposed to 20 for females) (Department for Transport 2017). In London, 70 per cent of frequent cyclists (those that cycle at least once a week) are men (Transport for London 2017). However, the ratio of female to male cyclists' deaths on London's streets is 2:1, which clearly shows that the city is less safe for women than men (Transport for London 2012). Overall, fear of the volume and speed of traffic, lack of proper cycling paths, concerns over personal appearance, psycho-social and cultural barriers, and harassment incidents have been reported to be a more serious barrier for women than men (Vandenbulcke et al. 2009; Parkin, Wardman, and Page 2007).

Moreover, there is a history, tradition, culture and society dimension to the use of cycling which would explain why cycling is more common and desirable in some countries, cities, or even population segments than others (Spotswood et al. 2015). For example, in 1950, cycling levels were higher in the UK (15 per cent of all trips) than they are now in Germany. Cycling in the UK, like many other countries including Germany, dropped from 1950 to 1975, but never recovered but continued falling to its current level (1.3 per cent of all trips). In contrast, in Germany cycling prospered remarkably due to policy change from car-friendly towards people-friendly cities.

**Table 4 Here: Gender pattern of activity types [note: mixed-gender Group Playing is not included in the table] (author)**

*Age pattern of activities:* As Table 5 suggests, adults are the most present age group in the neighbourhood (over 80 per cent of all activities), and elderly are the least present. This implies that these neighbourhoods prioritise adults' needs and serve as 'neighbourhoods for adults'. The low number of elderly people on the streets is consistent with this dominant

assumption that urban spaces are less appropriate for elderly people in terms of safety, addressing their basic needs, promoting social engagement, and maximising independence and easy movement (van Den Berg et al. 2015; Fobker and Grotz 2006; Burton and Mitchell 2006). This calls for creating age-friendly communities for which outdoor spaces are one of the main domains of concern (Menec et al. 2011; Lui et al. 2009; World Health Organization 2007).

A slightly higher presence of children in Berlin cases is due to the larger number of playing grounds across the neighbourhood which encourages children to play outside, and the special design of streets and traffic-calming measurements which make streets safer places for children (Elshater 2017; Bishop and Corkery 2017; Nordström 2010). The conducted household survey also suggests that inhabitants of Berlin case studies rate the feeling of safety for children within the neighbourhood space relatively higher than London cases. While in Kilburn and Bethnal Green 42.1 and 44.7 per cent of the participants feel that their children are very safe on the streets respectively, this figure is higher in Berlin neighbourhoods (61.9 per cent in Klausenerplatz and 47.8 in Samariterkiez).

**Table 5: Age pattern of activities (author)**

### ***Spatial pattern of outdoor activities***

Spatial pattern of outdoor activities explores spatial distribution and configuration of activities across the neighbourhood space. It shows density, intensity, and organisation of different activities in terms of type, gender, and age. It also helps us to examine probable correlation between different properties of social activities (type, gender, and age) and properties of neighbourhood space (e.g. land use and street network). At the macro level, analysing spatial pattern of outdoor activities explores whether neighbourhoods experience any type of spatial segregation in terms of gender and age, or enjoy an acceptable spatial equality. At the micro level, for example at the scale of a residential complex, it helps us to identify critical locations, such as places segregated by gender, and guides us to develop ideas for environmental improvements.

*Spatial pattern of activity type:* Figure 4 demonstrates all Walking activities which have taken place during weekdays and weekend; each point represents a Walking incident (a Walking person of any gender and age). Overall, spatial pattern of Walking is of two types: concentrated and scattered. In Kilburn, as would be expected, one observes a high concentration of Walking activities along with Kilburn High Road as a local hub; inner areas have remarkably less Walking activities. Klausenerplatz has a scattered pattern, so that Walking takes place almost evenly across the neighbourhood space. Two cases of Bethnal Green and Samariterkiez are somewhere in-between: a moderate concentration of Walking activity along with important streets (e.g. Bethnal Green Road and Frankfurter Allee), but an average density across the street network.

**Fig. 4 Here: All Walking activities (author)**

A closer look at the spatial pattern of Sitting and Cycling sheds light on the spatial differences of activities across the case study neighbourhoods. It has been already depicted in Table 2 that the percentage of Sitting activity is higher in Berlin cases than London (2.2 per cent and 4.7 per cent in Kilburn and Bethnal Green, 15.9 and 12 per cent in Klausenerplatz and Samariterkiez). As Figure 5 depicts, there is also a significant difference in spatial pattern of Sitting in the case study neighbourhoods in terms of intensity and spatial distribution. While in Berlin cases much more Sitting activities could be seen distributed across the inner streets, in London cases limited number of Sitting activities are concentrated on some

particular points. Site observation confirms that in London neighbourhoods Sitting activities are mainly around bus stops where people wait, and the rest in public spaces where benches are provided. In Berlin neighbourhoods, Sitting takes place either in front of cafés and restaurants which are located in most of the inner urban blocks, or in playing grounds and green spaces where proper places for sitting are provided.

Obviously, different environmental qualities such as noise, cleanliness, and maintenance could also affect the intensity of outdoor activities such as Sitting. Data extracted from the household survey confirms that participants in Berlin neighbourhoods have overall a higher satisfaction with noise, cleanliness, and maintenance than London cases. To give an example, while in Kilburn and Bethnal Green 31.7 and 32.6 per cent of the participants are satisfied with the noise in the neighbourhood respectively, this figure is higher in Berlin case (43.3 per cent in Klausenerplatz and 37.9 in Samariterkiez).

**Fig. 5 Here: All Sitting activities (author)**

Another significant spatial difference appears in the Cycling activity. As Figure 6 depicts, London neighbourhoods have a very low density of Cycling incidents largely concentrated along with major streets, with only a few cases within the inner areas. This suggests that Cycling is not considered as a means of transportation for intra-neighbourhood purposes. On the contrary, in Berlin neighbourhoods Cycling is a major outdoor activity and is evenly distributed across the street network. Klausenerplatz appears as the most cycling-friendly neighbourhood among all the cases, as inner areas are heavily used for cycling. In Berlin cases, there are designated cycling paths across the neighbourhood, what London cases lack. Moreover, traffic-calming measurements in Klausenerplatz make streets more comfortable and safer places for cycling. This is consistent with the existing literature regarding the importance of cycling paths and traffic-calming measurement for encouraging cycling activity (Pasha et al. 2016; Wheeler 2013; Wegman, Zhang, and Dijkstra 2012). To this one should also add the tradition of cycling in Germany as a typical and favourable transportation means (Pucher and Buehler 2008; Pucher and Dijkstra 2003). Overall, cycling is popular in Germany: in 2014, cycling was 9.8 per cent of all traveling cases. It was used for different purposes: 10.7 per cent for work places, 13 per cent for schools, 9.8 per cent for shopping, and 11.2 per cent for recreational activities (Bundesministerium für Verkehr und digitale Infrastruktur 2016). In Berlin, split modal for cycling was 13 per cent in 2008, 3 per cent more than average in Germany (10.0 per cent) (infas 2010). The conducted household survey also shows that bicycle ownership in Berlin cases is approximately 2 times higher than UK cases. The percentage of households with at least one bicycle is as follows: 89 (Klausenerplatz), 82 (Samariterkiez), 37 (Kilburn), and 33 (Bethnal Green). This indicates that Berlin case studies have even higher bicycle ownership than average in Germany which is 80.9 per cent (Bundesministerium für Verkehr und digitale Infrastruktur 2016). London case studies, in contrast, have lower bicycle ownership than average in England which is 42 per cent (Department for Transport 2017), and the share of Cycling mode in London is about 2 per cent (Transport for London 2016).

**Fig. 6 Here: All Cycling activities (author)**

*Spatial pattern of gender:* As noted earlier, there is no significant gender difference in many of the outdoor activities, except for Cycling, Playing, and Fixing. For example, in Bethnal Green, as Figure 7 depicts, two gender-related differences are observable: female Cycling is considerably less than male Cycling, and male Cycling is quite observable in inner-neighbourhood areas but female Cycling not. Table 4 has already shown that male Cycling in Bethnal Green is 42 per cent higher than female Cycling; however, Figure 7 also demonstrates that Cycling is spatially-bounded in the sense that females are reluctant to use



less crowded parts of the neighbourhood and prefer primary routes, probably for safety reasons. This is not the case in Samariterkiez, as one sees a similar spatial pattern of Cycling in terms of gender. These findings about the spatial pattern of gender correspond with the literature on 'gendered space' and 'spatiality of gendered space' which argue that urban space is spatially encoded with ideas of gender (Beebeejaun 2017; Andrews 2016; Doan 2010; Fenster 2005; Scraton and Watson 1998; Massey 1994; Spain 1992). Studies show that not only urban space in general, but also cycling as a social activity could be gendered: barriers to female cycling has been widely documented in the literature (Pucher and Buehler 2012; Steinbach et al. 2011; Garrard, Rose, and Lo 2008).

**Fig. 7 Here: All Cycling activities in Bethnal Green (author)**

*Spatial pattern of age:* As noted earlier, adults are the most present age group across the neighbourhood space. For children and elderly people, outdoor activities have a particular spatial pattern. As Figure 8 shows, in Kilburn, children are less present at the inner areas, and more concentrated along with Kilburn High Road which indicates that they are accompanying their parents. In other neighbourhoods, since there are a number of green spaces and playing grounds available within the neighbourhood, children are relatively evenly present across the neighbourhood space. Elderly people are the least users of neighbourhood space. They either use the high street for shopping and socialising purposes, or prefer quiet and non-traffic places inside the urban blocks where they feel safer and more comfortable.

**Fig. 8 Here: All activities of children (author)**

#### ***Outdoor social activity, land use, and street layout***

It has been widely argued that mixed land use promotes social life in urban space (Brown and Lombard 2014; Duany, Plater-Zyberk, and Speck 2010; Welsh and Farrington 2009; Grant 2002). Overlapping outdoor social activity maps with mixed land use map would be helpful to examine these arguments in the case study neighbourhoods. As Figure 9 demonstrates, there is a significant spatial correlation between mixed land use and social activity density: areas of mixed land use accommodate higher densities of social activities. Comparing four neighbourhoods one also realises that mixed land use pattern determines typological and spatial pattern of social activities. A concentrated pattern of mixed land use, for example in Kilburn, results in a concentrated pattern of social activities along with major arteries, while a scattered pattern of mixed land use, for example in Klausenerplatz, spreads social activities across neighbourhood space and leads to an even use of outdoor spaces. Land use also encourages activities with social significance, such as Sitting and Conversation, as areas of mixed land use more likely accommodate places of collective nature such as restaurants and cafés, particularly during the summer period.

**Fig. 9 Here: Overlap of all activities and mixed land use [Note: dark plots are mixed land use] (author)**

#### **Conclusion**

This paper developed a methodology to map neighbourhood outdoor social activities and analysed its application to four case studies in London and Berlin. The remainder of the paper underlines how the findings communicate with three theoretical arguments of the research as introduced earlier, and elaborates on the research and practice contribution of the findings to urban planning, urban design, and related disciplines.

Regarding the space-society dialectics, findings of this study prove an explicit and strong correlation between land use and outdoor social activities, so that urban areas with mixed

land use pattern show higher intensity and density of outdoor social activities. This is consistent with a large number of studies that provide evidence for such a correlation (Brown and Lombard 2014; Duany, Plater-Zyberk, and Speck 2010; Desyllas, Connolly, and Hebbert 2003; Leyden 2003; Grant 2002). The findings, however, do not support environmental determinism or architectural determinism, but advocate the ‘opportunistic approach’ which, as explained earlier, suggests that spatial layout and physical characteristics of the environment provide or preclude opportunities for interaction and socialisation, but do not cause such to occur. To give a concrete example, despite the existence of green space and well-designed open spaces within the estates in Bethnal Green and Kilburn which potentially promise being utilised by the inhabitants for socialising and entertainment, these areas are the least used outdoor spaces across the neighbourhood. To position this debate within the longstanding question of appropriate urban form one could argue that compact environments which are normally identified with higher rate of mix land use, connectivity, and population density, provide opportunities for outdoor interaction and socialisation, and thus could potentially enhance social sustainability, but do not cause such to occur.

Moreover, spatial distribution of activities in London cases registered itself as remarkably influenced by the existence of high street at the border of urban neighbourhoods as the places where diverse ethnic retails, land uses, cultural presences, and urban services are accommodated (Vaughan 2015; Hall 2015; Hall 2011; Griffiths et al. 2008; Guy 1998), what was referred to as ‘High Street Effect’. It has been discussed that in both Kilburn and Bethnal Green the accumulation of diverse land uses and services within a multi-ethnic social context along with the high street space significantly manipulates spatiality of outdoor activities, and this provides empirical evidence to the High Street Effect literature. Capineri’s (2016) recent empirical survey which explores dynamics of everyday urban life using volunteered geographic information (VGI) technique in the Kilburn High Road shows different aspects of multiple identities, socio-spatial diversity, and growing local-global interaction Massey (1994) observed in the Kilburn High Road in the early 1990s.

Findings of the research also emphasise on the significance of ‘third places’ in the modern urban life, in the way Oldenburg and others have discussed (Memarovic et al. 2014; Hickman 2013; Oldenburg 2007). Social activities investigated in this study, and outdoor spaces which accommodate them, are a main component of the ‘third place’. This has also a practical planning and policy implication: since this analysis demonstrated a positive significant correlation between mixed land use and arenas of ‘third place’ such as shops, pubs, cafés, restaurants, and community centres, the concept of mixed land use can be introduced as a potential policy that provides opportunities for establishing ‘third places’ and promoting social life.

This study provided a detailed, though limited, understanding from spatial, age, and gender dimensions of the outdoor social activities. Urban space is dominated by Walking; other activities have only a minor share in outdoor activities. This proves the importance of urban space for movement and walking purposes, but at the same time problematises the weak presence of non-movement activities such as Sitting, Conversation, and Playing which endangers the social life. Uneven spatiality of social outdoor activities is not limited to activity type, it also includes age factor. Urban space is obviously a space for adults, so that other age groups are remarkably excluded (Carroll et al. 2015). As noted, challenge of safety and security, which is related to traffic, street layout, and urban facilities, jeopardises active presence of children and elderly people in the urban space.

Gender dimension also demonstrated itself as an area of concern in the studied urban neighbourhoods. Although at the macro scale no significant gender difference was observable

in the overall neighbourhood outdoor activities, at the micro scale the analysis explored remarkable gender differences in terms of type of activity and its spatial distributional pattern. For example, urban space in London case studies is significantly gendered for Cycling and Playing activities, and this reflects gender-related challenges regarding urban safety and urban landscape (Steinbach et al. 2011; Pucher and Buehler 2008).

The introduced mapping methodology proved itself as an appropriate tool to explore typological, temporal, gender, and age pattern of outdoor social activities and their spatial distribution, and thus supported the concept of utilising mapping practice and analysis as a spatial form of knowledge and a tool for research (Roberts 2012; Harley 2001) The proposed methodology has also significant practical implications. It can identify areas of concern and problem, and thus provide policymakers, planners, and designers with helpful, evidence-based information to address these challenges through different improvement schemes and re-development programmes. The practical implication of the introduced methodology is in line with the 'opportunistic approach' discussed above. Based on this approach, planner's and designer's task is planning, designing, or re-developing the built environment in a way that provides opportunities for socialising and interaction (Southworth et al. 2012; Arnheim 2009; Talen and Ellis 2002; Jacobs 2000).

Despite informative and diagnostic character of the proposed methodology, it has some limitations and would benefit from some improvements for the future research. Observation was limited to one weekday and one weekend period. A more comprehensive and reliable image from the outdoor social activities could be obtained provided that more days were observed and analysed. Moreover, to explore seasonal differences (Tucker and Gilliland 2007), it is needed to extend observation days over the period of year under different climatic conditions. Types of activity could be also revisited to make the spectrum of activities more diverse and avoid cross-categorisation as much as possible, such as adding Waiting to the activity types. This methodology does not include the time factor in terms of the duration of the activity; the length of activities is important for achieving liveable environments (Gehl 2010). Moreover, it is largely based on quantitative inputs and data, and thus limited in explaining subjective logic and rationale behind some findings. In other words, it carefully explores but not properly explains. To gain a holistic view to the outdoor activities, follow-up investigations which employ complementary qualitative techniques such as ethnographic interview and focus group discussion would explain rationale behind the typological, gender, and age pattern of activities and their spatial distribution, and nuance our understanding. Finally, mapping method was designed to include social activities observable at the public and semi-public urban areas. In this way, social activities which take place between neighbours, either in private realms or through modern communication tools, are excluded. Mapping indoor social activities necessitates in-depth ethnographic research.

As noted, due to methodological and logistic limitations of the research, the outcomes of the study are partial but provide us with valuable insights into space, gender, and age dimensions of outdoor social activities in the case study neighbourhoods. The arguments are place-specific and any kind of generalisation should be treated with ultimate caution. An improved methodology based on abovementioned recommendations applied to a larger number of case studies backed up with ethnographic surveys would culminate in more reliable, robust, and in-depth results.

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Table 1: Distribution of activities

	Kilburn			Bethnal Green			Samariterkiez			Klausenerplatz		
	All	Weekday	Weekend	All	Weekday	Weekend	All	Weekday	Weekend	All	Weekday	Weekend
Number of activities	5228	2360	2868	6075	3042	3033	9711	5359	4352	7498	3973	3525
Per cent	100	45	55	100	50	50	100	55	45	100	52	48
Population density of social activity	<b>1.53</b>	0.69	0.84	<b>0.89</b>	0.45	0.44	<b>0.70</b>	0.38	0.31	<b>0.55</b>	0.29	0.26
Area density of social activity	<b>307.52</b>	138.82	168.70	<b>170.16</b>	85.21	84.90	<b>196.18</b>	108	88	<b>135.83</b>	71.97	63.85

Table 2: Typological pattern of activities

Type of Activity	Kilburn			Bethnal Green			Samariterkiez			Klausenerplatz		
	All (%)	Weekday (%)	Weekend (%)	All (%)	Weekday (%)	Weekend (%)	All (%)	Weekday (%)	Weekend (%)	All (%)	Weekday (%)	Weekend (%)
Moving	<b>73</b>	45	55	<b>66</b>	51	49	<b>59</b>	52	48	<b>53</b>	56	44
Sitting	<b>2.2</b>	37	63	<b>4.7</b>	34	66	<b>12</b>	63	37	<b>15.9</b>	46	54
Standing	<b>16.1</b>	45	55	<b>12.9</b>	55	45	<b>8.11</b>	52	48	<b>16.1</b>	45	55
Playing	<b>0.09</b>	0	100	<b>0.31</b>	21	79	<b>3.10</b>	66	34	<b>4.44</b>	43	57
Group Playing	<b>0.24</b>	85	15	<b>1.39</b>	11	89	<b>0.10</b>	90	10	<b>0.02</b>	100	0
Conversation	<b>2.23</b>	40	60	<b>2.35</b>	48	52	<b>1.89</b>	54	46	<b>1.85</b>	46	54
Cycling	<b>2.98</b>	57	43	<b>6.89</b>	56	44	<b>13.68</b>	60	60	<b>14.7</b>	56	44
Fixing	<b>1.98</b>	75	25	<b>3.88</b>	53	47	<b>1.05</b>	45	55	<b>1.17</b>	59	41

Table 3: Gender pattern of activities during weekday and weekend

	Gender	Total number of activities	Number of activities weekday	Number of activities weekend
<b>Kilburn</b>	Female	2657 (51 %)	1175 (44%)	1482 (55%)
	Male	2508 (49 %)	1156 (46%)	1352 (54%)
<b>Bethnal Green</b>	Female	2493 (42 %)	1309 (52%)	1184 (48%)
	Male	3529 (58 %)	1708 (48%)	1821 (52%)
<b>Samariterkiez</b>	Female	4607 (48 %)	2635 (57%)	1972 (43%)
	Male	5000 (52 %)	2677 (54%)	2323 (46%)
<b>Klausenerplatz</b>	Female	3701 (49 .73%)	1984 (53%)	1717 (47%)
	Male	3740 (50.26 %)	1967 (47%)	1773 (53%)

Table 4: Gender pattern of activity types (note: mixed-gender Group Playing is not included in the table)

	Gender	Type of activity (percentage of all activities)						
		Moving	Sitting	Standing	Playing	Group Playing	Cycling	Fixing
Kilburn	Female	54	47	51	0	0	26	6
	Male	46	53	49	100	15	74	94
Bethnal Green	Female	45	41	40	57	7	29	14
	Male	52	59	60	43	83	71	86
Samariterkiez	Female	51	44	42	50	0	45	20
	Male	49	56	58	50	80	55	80
Klausenerplatz	Female	52	48	47	51	0	47	28
	Male	48	52	53	49	100	53	72

Table 5: Age pattern of activities

	Percentage of activities by age-groups			
	Adults	Children	Teenager	Elderly
Kilburn	84	8	4	3
Bethnal Green	81	8	8	3
Samariterkiez	86	10	2	2
Klausenerplatz	80	13	3	4

Fig. 1: Case study neighbourhoods (author)



Fig. 2: Temporal pattern of activities – weekdays (author)

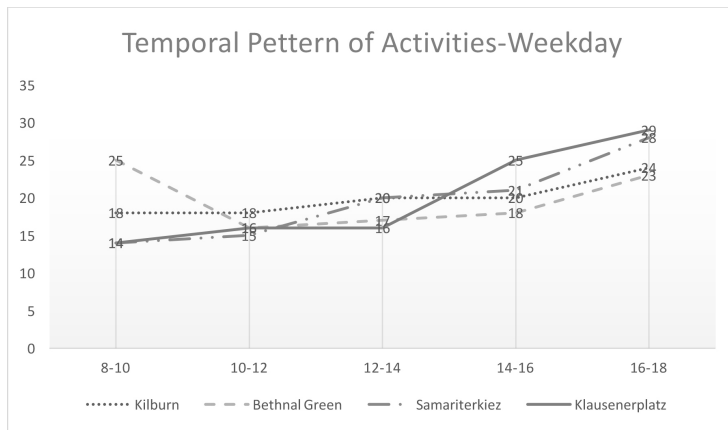


Fig. 3: Temporal pattern of activities – weekend (author)

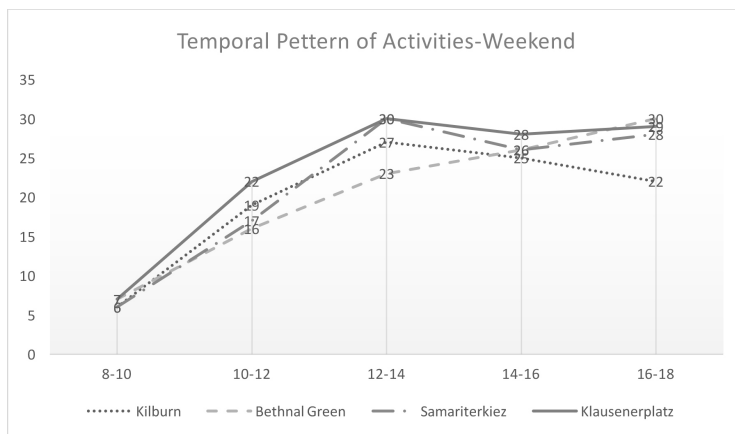
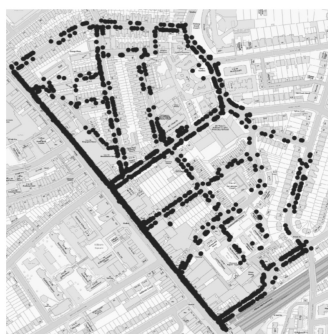
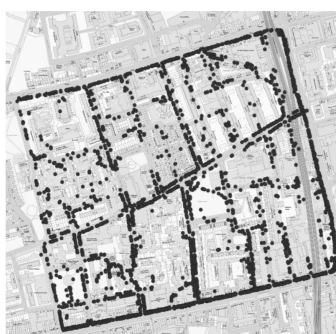


Fig. 4: All Walking activities (author)



**Kilburn**



**Bethnal Green**



**Samariterkiez**



**Klausenerplatz**



Fig. 5: All Sitting activities (author)

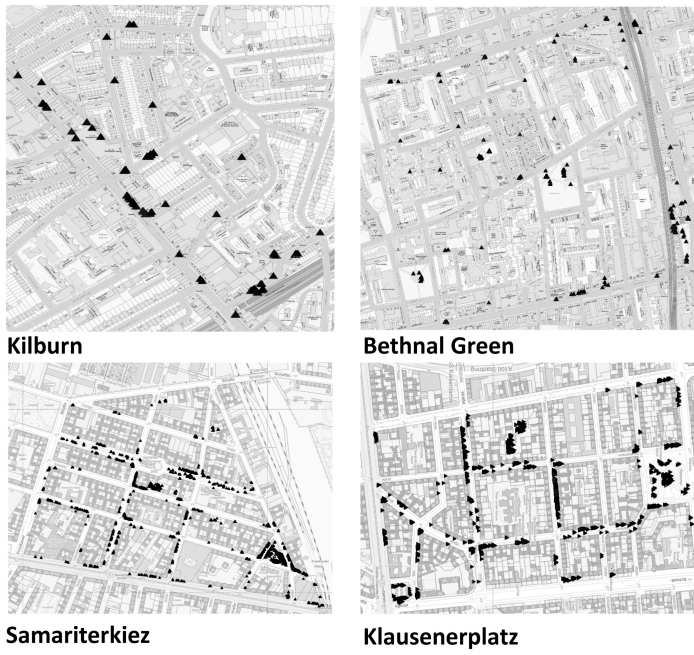


Fig. 6: All Cycling activities (author)

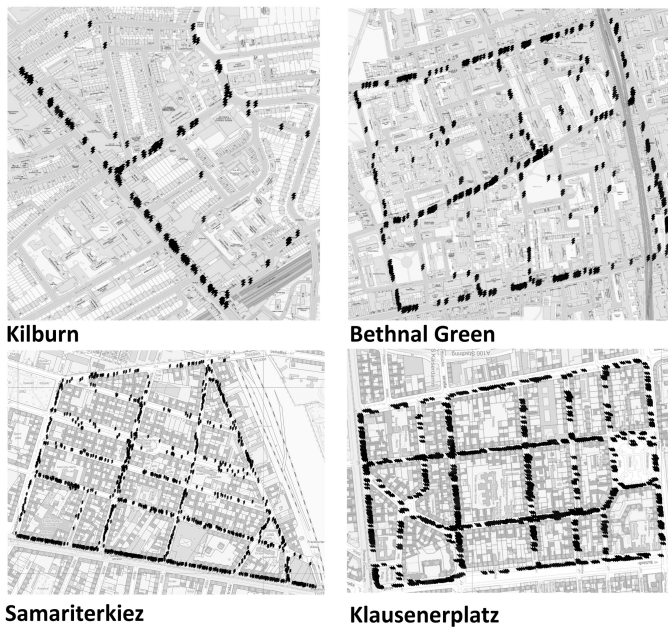


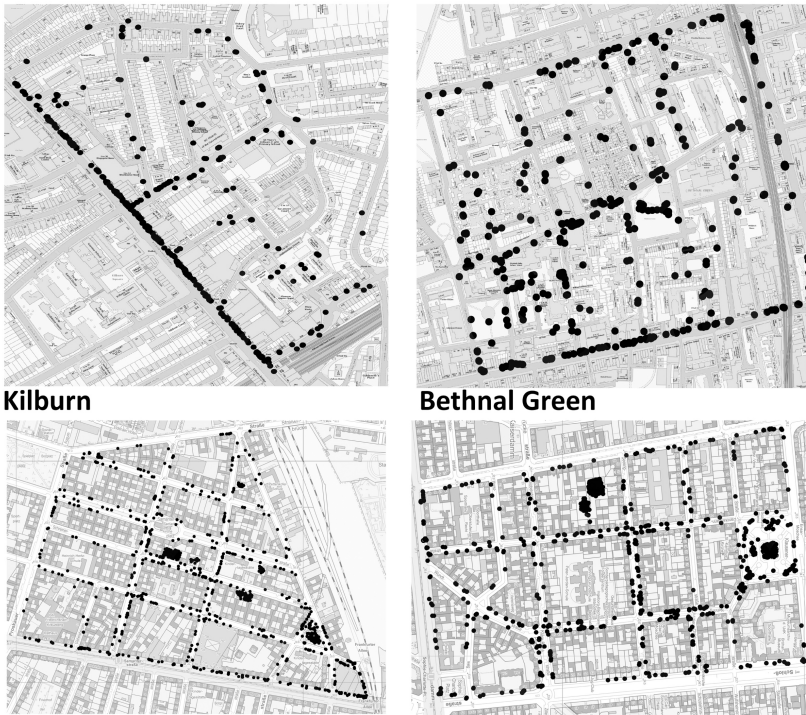
Fig. 7: All Cycling activities in Bethnal Green (author)



Bethnal Green, Female Cycling

Bethnal Green, Male Cycling

Fig. 8: All activities of children (author)



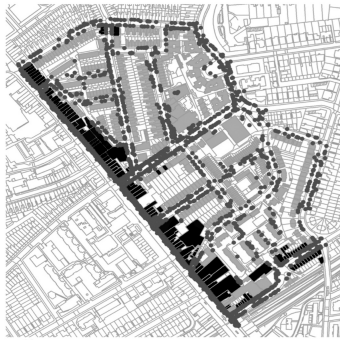
Kilburn

Bethnal Green

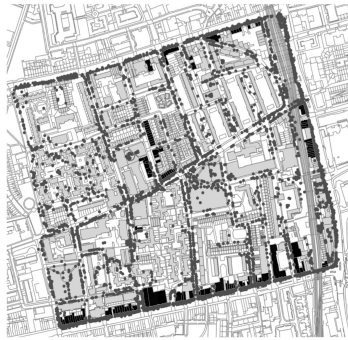
Samariterkiez

Klausenerplatz

Fig. 9 Here: Overlap of all activities and mixed land use [Note: dark plots are mixed land use] (author)



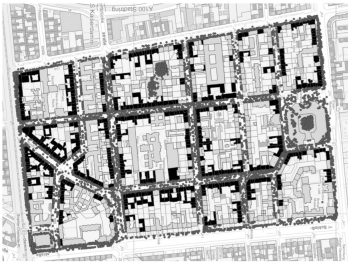
**Kilburn**



**Bethnal Green**



**Samariterkiez**



**Klausenerplatz**