Sheffield Hallam University

The influence of neighbourhood equity on parkrunners in a British city.

HAAKE, Steve <http://orcid.org/0000-0002-4449-6680>, HELLER, Ben <http://orcid.org/0000-0003-0805-8170>, SCHNEIDER, Paul <http://orcid.org/0000-0003-3552-1087>, SMITH, Rob and GREEN, Geoff <http://orcid.org/0000-0003-3471-3917>

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The influence of neighbourhood equity on parkrunners in a British city

Steve Haake: hwbsh@exchange.shu.ac.uk
Geoff Green (corresponding author): sedgg@exchange.shu.ac.uk
Paul Schneider: p.schneider@sheffield.ac.uk
Rob Smith: rasmith3@sheffield.ac.uk
Ben Heller: hwbbh@exchange.shu.ac.uk

Original article

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Abstract

Physical activity benefits both physical and mental health. Specific events may augment participation in physical activity at a population level. Parkrun is a popular, free, weekly, timed 5 km run or walk in city parks located across five continents. However, these events may be distributed inequitably, possibly reinforcing inequities in health. We tested the hypothesis that participation in parkrun is influenced by the socio-economic characteristics of both parkrunners and their park. Two parkruns 4.5 km apart were selected in the city of Sheffield in the United Kingdom. Defined by indices of multiple deprivation, Castle parkrun is located in an economically deprived neighbourhood and Hallam parkrun is in a prosperous area of the city. Parkrunners were defined by applying the same indices to the neighbourhood of home registration. Results: (1) the prosperous Hallam catchment area produced over five times more parkrun participants than Castle; (2) compared with Castle, Hallam parkrun attracted more participants from both catchment areas; (3) consequently, Hallam parkrun had seven times more participants than Castle parkrun. Conclusion: establishing parkruns in deprived areas is a necessary but not sufficient prerequisite for equity of participation.

Key Words: physical activity, inequities in health, participation, neighbourhood

Lay Summary

Parkruns are popular, free, weekly, timed 5 km runs or walks undertaken in city parks across the world. They contribute to both mental and physical health. But they may also reinforce inequities in health insofar as participation differs according to the socio - economic status of runners and the attraction of park venues. Our pilot study tests this proposition by comparing two parkruns in the British city of Sheffield; one located in the city's deprived East End, the other in the prosperous West End.

INTRODUCTION

There is compelling global evidence supporting the role of physical activity in the prevention of chronic disease (World Health Organisation, 2010). Participation in all forms of physical activity, including leisure and sporting opportunities, benefits an individual's physical and

mental health (Lee *et al*., 2012). However, 39% of adults in the UK do not engage in sufficient physical activity to benefit (British Heart Foundation, 2017) and Worldwide, 3.2 million deaths each year are attributed to physical inactivity (World Health Organisation, 2013). An example of the mid-stream and proximal influences on health outcomes are shown in the energy balance model developed by colleagues (Whitfield *et al*., 2015) and reproduced in Figure 1.

[Insert – Fig. 1]

Critical to this simplified model are upstream (or distal) supportive physical and social environments (Bauman *et al*., 2015). Globally, environments such as these are provided by the parkrun organisation which operates in 1,885 parks in over 20 countries. Parkruns are free, weekly, timed 5 km runs or walks in parks. Qualitative research has shown that the aspects of parkrun that attract participants are its accessibility, inclusivity, the provision of an opportunity for personal fulfilment as well as the support of others. Here 'place' is of critical importance: the pleasant environment of the park itself, free access and the supportive social environment of the parkrun event (Stevinson *et al*., 2015).

Parkrun participation at a country level is probably influenced by the state of its development, with 17 of the current (2019) 20 host nations within the 'very high' ranking band on the United Nations Human Development Index and a median ranking of 15/189 (UN Development Programme, 2019). Though physical infrastructure in these developed nations probably provides the most supportive environments, this is not to deny the value of parkrun to lower ranked nations. In South Africa, for instance, the mean time to complete a 5 km parkrun is around 41 minutes, compared to around 29 minutes in the UK (parkrun South Africa, 2019; parkrun UK, 2019). With a smaller number of parkruns than the UK (222 c.f. 672) but larger average attendances (276 c.f. 206) the motivations for participating in South Africa are likely to be very different: many participants choose to walk in parkrun's relatively safe venue set within the challenging environment of many South African cities.

Parkruns are nested within a hierarchy of socio-economic and cultural spaces: in divergent countries, differing urban areas and diverse neighbourhoods. These are potentially multiple and complex levels of influence on participation. (Seefelt *et al.* 2002; Faskunger, 2012; Saffari *et al*. 2018). The parkrun Research Board (based in the UK) has identified higher socio-economic status and neighbourhood as probable influences on registering and participating in parkrun –

on both joining and sustaining commitment (Beenackers *et al*., 2012; Gidlow *et al*., 2006; Hunter *et al*., 2015).

Relevant to unlocking the nexus of influences on runners themselves are multi-level analytical tools developed by epidemiologists to explore the relative influence of neighbourhood 'composition' and 'context.' These seek to explain the relative influence on the health of individuals of (a) their embedded socio-economic and cultural attributes and (b) their neighbourhood context, always taking account of the wider determinants of health at a global, country and city level. The concepts of 'composition' and 'context' may also be applied 'upstream' to supportive environments which encourage participation and a healthy lifestyle (Figure 1).

Swedish studies, for example, have detected a small but significant 'neighbourhood contextual effect' on worry about neighbourhood disorder (Mellgren *et al*., 2010) and the sense of security (Lindstrom *et al*. 2003) derived from the social capital of a neighbourhood. Within a different tradition led by Pierre Bourdieu, sociologists have applied the concept of *habitus* to a sense of place - 'ingrained habits, skills and dispositions.' It is the way that 'individuals perceive the social world around them and react to it' (Bourdieu, 1977). For many participants in parkrun, their neighbourhood is part of their social world and an important contributor to 'sports habitus' which is formed in childhood and can be influenced by neighbourhood schools (Engstrom, 2008).

In their analysis of a million adults in England, Farrell and colleagues find 'local area deprivation is independently and strongly associated with inactivity, controlling for the local availability of physical recreation and sporting facilities.' (Farrell *et al*., 2014). Our article explores the influence of 'place' on participation with a pilot case study from the city of Sheffield, addressing the critical question of whether neighbourhood inequalities are associated with differential participation rates in parkrun.

Our study tested the hypothesis that participation in parkrun is influenced by:

1. The socio-economic characteristics of the parkrunners as a subset of the local population; and
2. The characteristics of the park and its immediate surroundings. A schematic model is shown in Figure 2.

[Insert – Fig. 2]

METHODS

Our delimited study focuses on descriptive statistics of participation and neighbourhood context for two parkruns in Sheffield, Castle and Hallam (Figure 3).

[Insert – Fig. 3.]

The socio-economic status of park settings was defined using the UK Government's Index of Multiple Deprivation (IMD) for Lower Level Super Output Areas (LLSOA). These are the smallest units from which Population Census data is compiled and onto which official data on socio-economic context is mapped by the Office of National Statistics (ONS, 2016). The IMD scores for England's 32,844 Lower Level Super Output Areas are grouped in deciles where *n* is approximately 3,300 and 1 = most deprived. Scores were calculated for both a combined IMD and for each of its seven domains (Department of Communities and Local Government, 2015). Domains of population attributes are income, education, employment and health. Neighbourhood 'contextual' domains are crime, housing and the living environment. The LLSOAs containing Castle and Hallam parkruns have combined IMDs of 1 and 10 respectively, while the median IMDs of the adjacent LLSOAs are 1 (n=8) and 9 (n=9) respectively.

Participants in parkrun register at their home address (although it is possible to run anonymously). This involves giving name, age, postcode, activity level and 'home' parkrun. The latter is the parkrun the registrant identifies with, either because it is the one they are likely to participate in most often, or because it is the closest to where they live. We assume a degree of correspondence between the characteristics of runners and their registered neighbourhood.

There are two methodological caveats. First, a few parkrunners will have moved away from their original registration address and second, parkrunners are in many ways exceptional and unlikely to exactly mirror the socio-economic composition of their neighbourhood population as expressed in the IMD domains of employment, income, education and health. On the other hand, they may experience the common neighbourhood context of crime, housing and living

environment, with Hallam participants enjoying better conditions than their Castle counterparts.

Participants at the Castle and Hallam parkruns were also classified as follows: (a) coming from the park LLSOA or an adjacent LLSOA (inner catchment area); (b) coming from the area of the city for which this parkrun is closest (catchment area) ; (c) registered in another parkrun catchment area less than 10 km away; and (d) registered over 10 km distant. The 10 km threshold was chosen to represent the approximate confines of the Sheffield City Region.

The catchment areas of the seven parkruns in the Sheffield City Region were defined as the shortest linear distance to the centroid of each park (Figure 3). The median IMD of the Castle and Hallam Catchment areas were 2 and 8 respectively. The population of the Hallam and Castle catchments were estimated by summing the population of their constituent LLSOAs.

The data analyst for parkrun provided the following data:

1. An anonymized list of all participants in the two parkruns for 5th, 12th, 19th and 26th May 2018;
2. The home (or 'favourite') parkrun, nearest geographical parkrun, and LLSOA IMD percentile for each participant, identified by postcode supplied at registration;
3. The number of parkrunners in Castle and Hallam's catchment areas and the parkruns they attended.

RESULTS

Number of participants at each parkrun

Figure 4 shows how participation at the Hallam and Castle parkruns has evolved over time, with our snapshot of May 2018 located by a vertical line. During this month, the average number of participants over four events was 78 at Castle and 717 at the longer established Hallam. Although participation at both venues has increased over time, Hallam nevertheless recorded much higher participation at every phase of its development.

[Insert – Fig. 4]

Table 1 shows the following: (1) the number of parkrunners in the catchment areas of Castle and Hallam parkruns; and (2) the parkruns they participated in (Hallam, Castle and other). The results show that 1,433 unique individuals participated in Hallam parkrun, while 205 participated in Castle parkrun. Thus, Hallam parkrun attracted 7.0 times as many parkrunners as Castle.

[Insert - Table 1]

Number of parkrunners in each parkrun's catchment area

The columns in Table 1 show that 1,377 individuals from the Hallam catchment area participated in a parkrun (anywhere) compared to 251 from the Castle catchment area. Thus, the Hallam catchment area produced 5.5 times as many parkrunners as the Castle catchment area. (It should be noted that the Hallam catchment population is approximately 8.5% larger than the Castle catchment area so that the ratio normalised by population would be 5.07

Attraction of each parkrun to parkrunners from the other's catchment area

Table 1 also shows that Hallam parkrun attracted 913 parkrunners or 66% of its own catchment total of 1,377. In contrast, Castle parkrun attracted 73 parkrunners or 29% of its own catchment total of 251. Hallam parkrun was 2.3 times as attractive (66%/29%) to its own catchment area as Castle parkrun was to its.

Hallam parkrun attracted 28 parkrunners from Castle's catchment area or 11% of its catchment total of 251. In contrast, Castle parkrun attracted 48 parkrunners from Hallam's catchment area or 3.5% of its total of 1,377. Hallam parkrun was 3.2 times as attractive (11%/3.5%) to Castle catchment parkrunners as Castle was to Hallam catchment parkrunners. Thus, Hallam parkrun was 2 to 3 times more attractive than Castle parkrun to parkrunners from their catchment areas.

Travel distance to each parkrun

Travel distance may also be important in choosing which parkrun event to attend. Figure 5 shows that 9% of parkrunners at Castle came from its inner catchment area compared to 16% for Hallam. In total, 36% of Castle parkrunners came from its catchment area compared to 64% for Hallam. Interestingly, the proportion travelling up to 10 km to each parkrun is approximately the same at Castle and Hallam at 83% and 81% respectively. The remainder of

parkrunners registered with home parkruns over 10 km distant, often as far as London, may be students, visitors or people who have moved since registration.

[Insert – Fig. 5]

Participants

Table 2 shows the median IMD and its domains of the participants at each parkrun compared to the median for the Sheffield population. Hallam participants were drawn from more prosperous neighbourhoods of the city with a composite median IMD decile of 9. Castle participants were registered in more deprived neighbourhoods with a median score of 3, below the median score of 5 for Sheffield's population spread across a mosaic of 345 LLSOAs. The biggest difference is recorded in the education domain; 2 for Castle, 10 for Hallam parkrunners.

[Insert – Table 2]

DISCUSSION

The headline findings are of 'place' inequality between the venues and between participants. Although in many ways the City of Sheffield reflects national average scores on deprivation, our preliminary analysis shows differential participation in parkrun is linked to both the setting of the parks (socio-economic, environmental etc.) and the neighbourhood setting of participants' registered addresses. A deeper analysis of the relationship between participants and parks reinforces the headline message. Without participants 'borrowed' from the Hallam catchment, participation in Castle would be reduced by almost a quarter. If parkrun participation reflects general levels of activity, or even inactivity, then our findings concur with those of Farrell and colleagues: 'both education and household income are strongly associated with inactivity even when controlling for local area deprivation, the availability of physical recreation and sporting facilities.'

Further analysis links participation to the intersection of travel and socio-economic circumstances. Whilst the majority of participants in Hallam parkrun (64%) are drawn from its catchment area, only 36% of Castle parkrunners live within its catchment. The majority of Castle runners, from beyond the park's catchment area, has a combined IMD of 3, which is

below the Sheffield average (5), and far below that of Hallam (9). This is also the average IMD of the LLSOAs within 10 km of Castle park, which appears to be the threshold for travel in Sheffield (less than half an hour by car). This evidence suggests that establishing parkruns within areas of high deprivation may not, of itself, be sufficient to change local behaviour around physical activity.

This supports our hypothesis that parkrun participation is influenced both by where parkrunners live and the park they use. Both contribute separately to a sports habitus, expressed according to Engstrom (2008) as 'choice or taste for various sports, forms of exercise and outdoor (life) activities.' However, home neighbourhoods - both their environment and their schools - are also generative of the sports habitus embedded in individual participants during their early life-course. In the UK, as in many other countries, neighbourhood schooling has a profound influence on educational performance. Neighbourhood context therefore helps shape population composition. And, as table 2 shows, the most significant difference in parkrunners attending the Hallam and Castle events is educational outcome. Both neighbourhood context and population composition combine to determine sports habitus and influence participation in communal exercise. 'In reality, according to Bourdieu in his seminal article Sport and Class' (1978) 'it is the relation to one's own body, which distinguishes the working classes from the privileged classes.'

Socio-economic factors appear paramount in explaining the differential attraction of the Castle and Hallam events. However, further granular analysis of the park venues may add a multiplier effect. Castle is run over three laps compared with Hallam's two. Castle has a significant hill which may be off-putting for runners seeking personal best times. The Castle venue is at the top of a hill while Hallam is in a valley, so walking or running to the Castle venue is more demanding. For drivers, on-street parking near Castle is limited, and the park lacks a vibrant café for rest, recuperation and socialising. An additional factor could be the longevity of Hallam parkrun, inaugurated three years and 153 events prior to Castle. Early registrants to parkrun had no choice but to choose Hallam. Of those living closest to Castle, familiarity with Hallam may have prevailed.

Our delimited analysis has not sought to nest motivation and volition within the wider socio-economic determinants of city life. From their review, Machaczek and colleagues suggest that motivational-based interventions might be least successful in the communities where it is most

needed, particularly economically deprived communities (Machaczek *et al*., 2018). More primary research will provide a richer more nuanced picture of their dynamic interaction. Further analysis of the IMD domains may illuminate the causal chain in Figure 1 linking supportive environments via lifestyle to physical activity then health. For example, though 'education' is a 'composition' domain reflecting the embedded status of neighbourhood populations, it is often the product of neighbourhood schools which differentially create a 'sports habitus' leading to physically active lifestyles.

CONCLUSION

Our pilot study highlights how parkrun participation is influenced both by where parkrunners live and the location of parkrun events. An affluent catchment area population produced over five times more parkrunners than the population of a more deprived catchment area. This differential was increased to a factor of seven by adding in the relative attraction of each park setting. The challenge for policymakers and decision-takers is that parkrun appears to reflect and maybe reinforce differential levels of physical activity linked to socio-economic context, contributing to greater inequities in health status.

With the aim of promoting greater equity, Sport England declared in 2018 an intent to invest £3 million (USD 3.75m) to increase 'the number of parkrun events by one third in socially deprived areas in England over the next three years' (Sport England, 2018). However, the backcloth of deep-rooted socio-economic inequalities will probably persist in the short and medium term. The evidence marshalled in our study suggests that investing in 'deprived' venues is a necessary but not sufficient prerequisite for greater equity of participation. The dynamic between people and place is complex. A finely tuned sports habitus may hold the key.

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