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Research Paper

Inequities in the quality of urban park systems: An environmental justice investigation of cities in the United States

Alessandro Rigolon[a,*], Matthew Browning[a], Viniece Jennings[b]

[a] University of Illinois at Urbana-Champaign, USA
[b] U.S. Forest Service – Southern Research Station, USA

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ABSTRACT

A growing body of research shows affluent White neighborhoods have more acres of parks and more park facilities than low-income ethnic minority communities in many Global North cities. Most of these investigations focused on neighborhood-level differences and did not analyze broader inequities across cities. This is a particularly significant limitation in the U.S., where changes in the political economy of parks due to a reduced local tax base have led cities to compete against each other to secure park funding from national nonprofits and public agencies. To address this gap, we examined whether the quality of urban park systems – measured through The Trust for Public Land's ParkScore – varies depending on a city's median income and ethnic composition. Based on multivariate regressions in which we control for features of the urban fabric, we found U.S. cities with higher median incomes and lower percentages of Latino and Non-Hispanic Black residents have higher ParkScores than other cities. Some inequities also emerged for park coverage, park spending per person, and park facilities, with majority-Latino cities being particularly disadvantaged. These findings echo the results of neighborhood-level studies in Global North contexts, suggesting neighborhood-level inequities in park provision might scale up to inequities across cities. This study contributes to environmental justice theory and advocacy by demonstrating the importance of scaling up analyses of park provision to cross-city comparisons. Implications for landscape planning, public policy, and grant-making are discussed.

1. Introduction

Urban green spaces – including parks, gardens, and trails – are fundamental elements of cities around the world, as they bring several benefits related to health, sustainability, and resilience. In particular, green spaces benefit urban health through physical activity opportunities, improved mental health and well-being, and stress reduction (Larson, Jennings, & Cloutier, 2016; Lee & Maheswaran, 2011; Markevych et al., 2017). Urban green spaces also provide cities and their residents with ecosystem services that support human well-being (Flocks, Escobedo, Wade, Varela, & Wald, 2011), sustainability (Jennings, Larson, & Yun, 2016), and resilience (Wolch, Byrne, & Newell, 2014). Among the variety of open spaces in cities, urban park systems represent networks of publicly owned green spaces for active and passive recreation managed by public park agencies.

Scholars have investigated how park provision relates to socioeconomic and ethnic factors. Several studies have reported inequities in park acreage, quality, and safety in many cities in the Global North and Global South, with low-income ethnic minority people often experiencing disadvantage (Boone, Buckley, Grove, & Sister, 2009; Macedo & Haddad, 2016; Rigolon, 2016, 2017; Tan & Samsudin, 2017; Wolch, Wilson, & Fehrenbach, 2005; Wolch et al., 2014). These findings, combined with the aforementioned benefits of green spaces for health promotion and well-being (Larson et al., 2016; Markevych et al., 2017), warrant that park provision is a significant environmental justice (EJ) issue impacting low-income ethnic minority communities around the world (Boone et al., 2009; Rigolon, 2016; Wolch et al., 2005, 2014).

The majority of EJ studies on parks have analyzed inequities in park provision between different neighborhoods within a city (Rigolon, 2016). Although neighborhood-level inequities are very important, studies at this scale elude broader EJ issues related to the provision of parks. Starting in the 1970s, the political economy of urban parks in the U.S. significantly changed, notably in the ways parks are funded (Holifield & Williams, 2014; Joassart-Marcelli, Wolch, & Salim, 2011; Pincetl, 2003; Wolch et al., 2005). Such changes included shifts in funding mechanisms – from tax-based to competitive grants – and scale – from local funding to state and federal funding (Holifield & Williams,

* Corresponding author at: 104 Huff Hall, 1206 South Fourth St., Champaign, IL 61820, USA.
E-mail addresses: rigolon@illinois.edu (A. Rigolon), brownin@illinois.edu (M. Browning), vjennings02@fs.fed.us (V. Jennings).

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2014; Joassart-Marcelli et al., 2011; Perkins, 2011; Pincetl, 2003; Wolch et al., 2005). In particular, over the last five decades, cities in the U.S. have seen significant cuts in local funding for parks, which have been part of broader fiscal austerity trends (Gerber, 2012; Holifield & Williams, 2014; Joassart-Marcelli et al., 2011; Pincetl, 2003). These funding cuts are often linked to freezes or decreases in property taxes, which in the U.S. have traditionally paid for parks (Joassart-Marcelli et al., 2011; Pincetl, 2003). With limited local resources to build or improve parks, cities have to look for funding from national and state nonprofits, state agencies, and the federal government. In turn, these organizations, and particularly the voluntary sector, have stepped up and provided competitive grants for park construction and improvement (California Department of Parks, 2003; Harnik & Barnhart, 2015; Joassart-Marcelli et al., 2011; National Recreation, 2012; Perkins, 2013; Walls, 2014). Importantly, numerous authors have noted that competitive grants may exacerbate park inequities because wealthier cities are more likely to have the skills and capacity to prepare winning grant applications than lower-income communities (Joassart-Marcelli et al., 2011; Perkins, 2011; Pincetl, 2003; Wolch et al., 2005).

These shifts in funding mechanisms and scales warrant the study of how the quality of urban park systems varies across U.S. cities. As cities are competing from limited nonprofit, state, and federal funding, grant-making organizations should be aware of cross-city inequities in park provision and understand differentials in cities' capacities to apply for grants. Yet very few investigations have examined park inequities across multiple cities (see Chen, Hu, Li, & Hua, 2017; Dahmann, Wolch, Joassart-Marcelli, Reynolds, & Jerrett, 2010; Joassart-Marcelli, 2010; Joassart-Marcelli et al., 2011), and to our knowledge no study has done so using a comprehensive measure of the quality of urban park systems.

In this paper, we advance the EJ literature on urban parks by scaling-up the analysis of inequities in park provision to the city level. Focusing on 99 of the most populated 100 cities in the U.S. (excluding Gilbert, AZ for data limitations), we examine whether the quality of urban park systems – measured through The Trust for Public Land's (2017) ParkScore (a valid and reliable index) – varies based on the cities' socioeconomic status and ethnic composition. We define the quality of urban park systems as their capacity to serve the recreation needs of a diverse range of residents, including providing appropriate acreage, walking access, facilities, and programming (see Harnik, 2003; Rigolon & Németh, 2018; Shing & Marafa, 2006; The Trust for Public Land, 2017). We find wealthier and Whiter cities have higher quality park systems than less affluent and more ethnically diverse cities, even when controlling for several characteristics of the urban fabric.

2. Literature review

A thriving environmental justice literature shows the provision of parks, including their quantity, quality, and safety, has mostly benefitted privileged groups such as wealthy and White people in urban areas around the world (Rigolon, 2016; Wolch et al., 2014). Environmental justice (EJ) involves the fair distribution of environmental hazards and amenities (including parks), as well as inclusive decision-making processes to locate such hazards and amenities (Schlosberg, 2004). When focusing on urban parks, many authors have used an equity lens to characterize fair distribution (see Boone et al., 2009; Rigolon, 2016). While equality describes a condition in which every person receives the same resources, equity requires that people with higher park need – including low-income, ethnic minority people, and young people – have a higher provision of parks than other groups (Boone et al., 2009; Rigolon, 2016, 2017).

Most EJ studies on park provision analyzed neighborhood-level inequities within a city or metropolitan area (Rigolon, 2016). Neighborhood-level studies of cities in the Global North – including in the U.S., England, Germany, and Australia – show low-income ethnic minority people tend to live in closer proximity to parks than wealthier White people, but the latter are at a significant advantage in terms of acres of parks, acres of parks per person, park quality, park maintenance, and park safety (Boone et al., 2009; Comber, Brundson, & Green, 2008; Crawford et al., 2008; Hughey et al., 2016; Kabisch & Haase, 2014; Rigolon, 2016, 2017; Sister, Wolch, & Wilson, 2010; Vaughan et al., 2013; Wolch et al., 2005, 2014). Many neighborhood-level studies in cities of the Global South – including urban areas in Eastern Asia, Africa, and Latin America – highlighted similar inequities in acreage, access, and quality (Macedo & Haddad, 2016; McConnachie & Shackleton, 2010; Tan & Samsudin, 2017; Ye, Hu, & Li, 2018); however, others found no significant associations between socioeconomic status and park provision (Fang, 2017) or better provision for disadvantaged groups (Xiao, Wang, Li, & Tang, 2017).

A few articles presented neighborhood- and individual-level analyses for entire countries. One study centering on the entire U.S. found high-poverty and majority-minority neighborhoods in urban regions have parks in closer proximity, but they also have a lower percentage of green space than wealthier and Whiter neighborhoods (Wen, Zhang, Harris, Holt, & Croft, 2013). Other scholars surveyed samples of U.S. residents and found similar disparities in park acreage and the number of park facilities (Gordon-Larsen, Nelson, Page, & Popkin, 2006; Powell, Slater, & Chaloupka, 2004). Also, an investigation of 53 German cities showed wealthier people had more acres of parks near their home than less affluent residents (Wüstemann, Kalisch, & Kolbe, 2017).

Very few EJ investigations on park provision relied on cities as units of analysis. Three studies of municipalities in Southern California (U.S.) revealed inequitable distributions of public recreational programs, park funding, and park or recreation nonprofits across cities, with lower income and majority-minority cities experiencing disadvantage (Dahmann et al., 2010; Joassart-Marcelli, 2010; Joassart-Marcelli et al., 2011). A national investigation in China found wealthier cities have higher green space coverage than less affluent cities (Chen et al., 2017). Also, two studies of European cities reported city-level differences in park provision but did not relate such differences to city-level income and ethnic compositions (Kabisch, Strohbach, Haase, & Kronenberg, 2016; Wüstemann et al., 2017).

Although the EJ literature on park provision has made several strides in the last two decades, a few questions remain unanswered. First, most studies used neighborhoods as the unit of analysis, and only the four studies mentioned above (Chen et al., 2017; Dahmann et al., 2010; Joassart-Marcelli, 2010; Joassart-Marcelli et al., 2011) conducted cross-city analyses on park equity. Second, multi-dimensional indices to measure the provision and quality of green space have been developed for several communities around the world (Edwards et al., 2013; Fan, Xu, Yue, & Chen, 2016; Gidlow, Ellis, & Bostock, 2012; Heckert & Rosan, 2016; Kaczynski, Stanis, & Besenyi, 2012; Kaczynski et al., 2016; Rigolon & Németh, 2018; Roubal, Jovaag, Park, & Gennuso, 2015; The Trust for Public Land, 2017; Van Herzele & Wiedemann, 2003); yet to our knowledge no EJ study at the city level has integrated different characteristics (e.g., park acreage, access, and facilities) to describe the quality of urban park systems.

2.1. Research questions

Given these limitations, we ask an important question about park equity for 99 of the largest 100 cities in the U.S.: *How do cities' socioeconomic and ethnic characteristics relate to variables that describe features of their park systems?* Such variables include: the overall quality of their park systems described through The Trust for Public Land's (2017) Park Score index; park acreage in relation to the city's surface (*park coverage*); the percentage of residents living within 10 min of a park (*park access*); park spending per resident (*park spending*); the number of several park facilities (*facilities score*); and income-based inequalities in walking access to parks (*access inequality*). Given the shifts in funding mechanisms and scale that have changed the political economy of parks in the U.S. (Holifield & Williams, 2014; Joassart-Marcelli et al., 2011), answering these questions can advance EJ theory and practice by