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Research Paper

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

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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,

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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

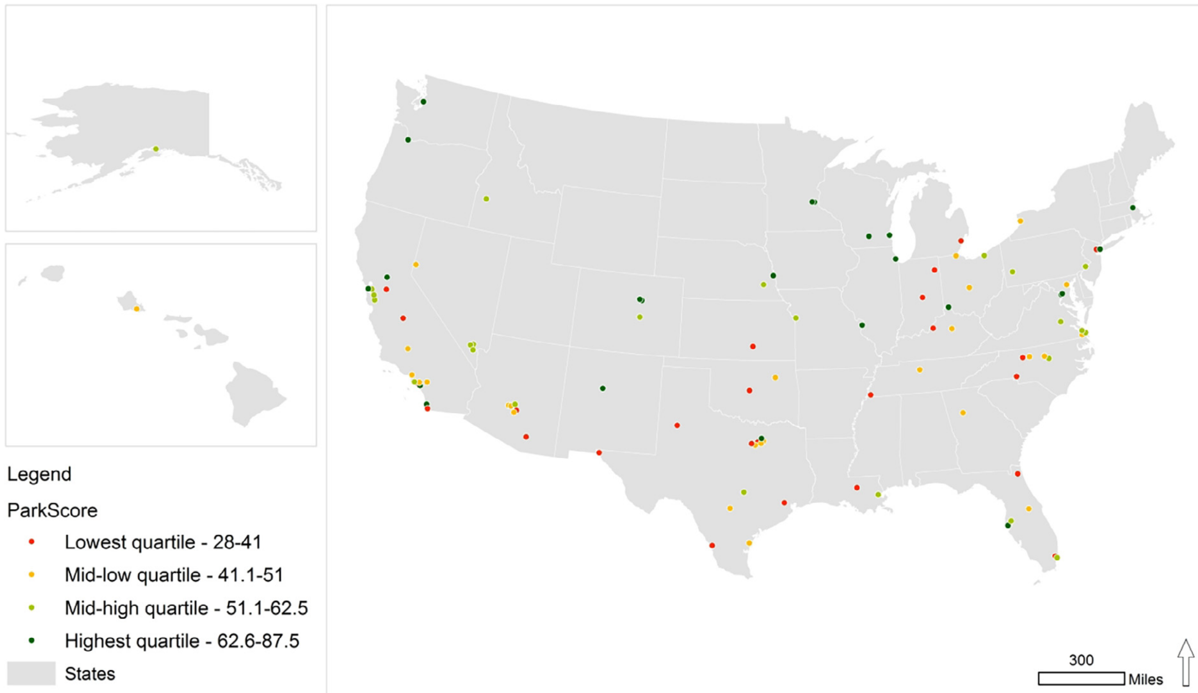

Fig. 1. Location and ParkScore of the 99 selected cities in the U.S.

scaling-up analyses of park provision to uncover cross-city inequities.

3. Methods

We used a cross-sectional study design to analyze associations between city-level demographics and the quality of urban park systems while controlling for urban fabric characteristics. We focus on 99 of the 100 cities with the largest population in the United States, excluding Gilbert, AZ for which ParkScore statistics were not available. The 99 selected cities are distributed throughout the United States (see Fig. 1). A complete list of cities is included on the ParkScore website (The Trust for Public Land, 2017); see also Table A3 in Appendix A for a subsample of the 99 cities.

3.1. Sources of data and measures

We obtained secondary data about urban park systems for the 99 selected cities – including the ParkScore index and other features – from The Trust for Public Land (2017). ParkScore is an index developed by The Trust for Public Land (a U.S. environmental nonprofit) to describe and compare the quality of urban park systems of 99 cities in the U.S. ParkScore can vary between 0 and 100, with higher scores describing park systems with higher quality. We chose to use ParkScore as a metric for the quality of urban park systems because, although several other indices and measures have been developed to describe the *quality of individual parks*, to our knowledge it is the only tool developing the overall *quality of a city's park system* for the U.S.

The composite index includes three major components of urban park systems – park acreage, park access, and facilities and investment (see Eq. (1); The Trust for Public Land, 2017) – which several authors have considered as important characteristics of green spaces in cities (Hughey et al., 2016; Joassart-Marcelli, 2010; Kaczynski et al., 2016; Rigolon, 2016). Each of the three components has equal weight and can account for up to a third of the composite index, which is a viable strategy due to a lack of conclusive evidence regarding which component is more important for park use and physical activity (see Cohen et al., 2016).

$$\begin{aligned}\text{ParkScore} = {} & \text{Park Acreage score (median park size score} \\ & + \text{park coverage score)} + \text{Park Access score} \\ & + \text{Facilities \& Investment score} \\ & \text{(park spending per resident score} + \text{facilities score)}\end{aligned} \quad (1)$$

We also collected data describing city-level demographics and features of the urban fabric from the 2016 American Community Survey (ACS; 1-year estimate; United States Census Bureau, 2017). The 2017 ParkScore release refers to data that the Trust for Public Land mostly collected in 2016; thus, park and demographic data reflect a similar timeframe. Table 1 describes the independent and dependent variables we include in this study, their data source, the type of independent variables (confounder or variable of interest), and the dependent variables' relationship to the ParkScore index.

The dependent variables include metrics that describe the quality of urban park systems comprising the total ParkScore index and several of its components. In particular, we considered ParkScore, park coverage, park access, park spending per person, a facilities score, and access inequality (see Table 1). We chose to include the composite index (ParkScore) and some of its components to uncover nuances in park provision across cities with different socioeconomic and ethnic characteristics. We also considered data on specific facilities (i.e., playgrounds, basketball hoops, recreation centers, and dog parks) as distinct dependent variables (see Table 5), which is important because several nonprofit organizations in the U.S. fund only certain types of park facilities (see KaBOOM!, 2018; Local Initiatives Support Corporation, 2016). All park variables in Table 2, except the access inequality metric, were obtained directly from the TPL dataset. For each city, we also calculated a neighborhood-level index of access inequality as the ratio between the percentage of low-income census block groups located within half-a-mile of a park and the same percentage citywide. We developed this index to uncover how citywide demographics might be associated with neighborhood-level disparities in park access. TPL defines low-income census block groups as those with households making less than 75% of a city's median household income.

The independent variables include five metrics describing a city's urban fabric (e.g., population density), which we use as confounding

Table 1
Names, Descriptions, and Data Sources for Independent and Dependent Variables.

Independent Variables			
Variable	Description	Data Source	Type
Total population	Total population of city	ACS	Confounder – Urban fabric
Population density	Number of residents per acre	ACS	Confounder – Urban fabric
Percent drivers	Percentage of people aged 16 or above commuting to work via automobile (alone or carpool)	ACS	Confounder – Urban fabric
Median age of housing	Median age of housing structure in years: 2018 minus the median year when housing buildings were built	ACS	Confounder – Urban fabric
Percent vacant housing	Percentage of vacant housing units – i.e., not occupied by a resident	ACS	Confounder – Urban fabric
Median income	Median household income in dollars	ACS	Variable of Interest (VOI) – Demographics
Percent Blacks	Percentage of Non-Hispanic Black residents	ACS	VOI – Demographics
Percent Latinos	Percentage of Latino/Hispanic residents	ACS	VOI – Demographics
Dependent Variables			
Variable	Description	Data Source	Relationship to ParkScore
ParkScore	Composite index to describe the quality of urban park systems	TPL	Index
Park coverage	Park surface as a percentage of the city area	TPL	Part of the ParkScore index: Contributes to up to 16.66% (Acreage group)
Park access	Percentage of resident living within half-a-mile (800 m) of a park – considered as walking access	TPL	Part of the ParkScore index: Contributes to up to 33.33%
Park spending per person	Park spending per resident, calculated as average for the previous three years	TPL	Part of the ParkScore index: Contributes to up to 16.66% (Facilities/Investment)
Facilities score	Per-resident data about basketball hoops, playgrounds, recreation centers, and dog parks	TPL	Part of the ParkScore index: Contributes to up to 16.66% (Facilities/Investment)
Access inequality	Ratio between the percentage of low-income census block groups located within 800 m of a park and the same percentage citywide	TPL	Not part of the ParkScore index

Note: ACS is the American Community Survey run by the U.S. Census Bureau. TPL is the Trust for Public Land.

Table 2
Descriptive Statistics for the Independent and Dependent Variables.

	Mean	SD	Range
Independent Variables			
Population	642,601	967,909	223,152–8,537,673
Population density	7.55	6.5	0.27–43.72
Percent drivers	81.86%	13.67%	26.37%–93.75%
Median age of housing	46	15	18–79
Percent vacant housing	9.95%	4.56%	2.16%–28.39%
Median income	$56,111	$17,120	$27,551–$122,419
Percent Blacks	19.61%	17.01%	0.28%–78.66%
Percent Latinos	25.07%	20.98%	2.78%–95.64%
Dependent Variables			
ParkScore	52.57	13.95	28.50–87.50
Park coverage	11.60%	10.17%	1%–84%
Park access	66.59%	18.68%	27%–100%
Park spending per person	$100.92	$60.78	$21.23–$279.3
Facilities score	9.87	3.86	2–19
Access inequality	1.05	0.07	0.94–1.32

n = 99.

variables, and three metrics describing citywide demographics (e.g., median household income), which are the independent variables of interest of this study (see Table 1). Among the urban fabric variables used as confounders, we consider population density and the percentage of people who drive to work (alone and in carpool) as measures of urban sprawl; that is, the degree to which cities have a decentralized structure (housing and jobs) and a low population density (Ewing, Pendall, & Chen, 2003; Glaeser & Kahn, 2004; Sultana & Weber, 2007; Williamson, 2008). The percentage of car commuters has been found to be associated to measures of sprawl such as population density (Sultana & Weber, 2007), and has therefore been used as a proxy for sprawl (Williamson, 2008). Indeed, more decentralized and less dense cities make public transit less economically viable and likely require more residents to commute via car (Williamson, 2008). Thus, we consider cities with a high percentage of driving commuters as being characterized by higher urban sprawl. We chose to include measures of sprawl in our analysis because previous research showed areas characterized by higher sprawl have more acres of parks but lower percentages of people with walking access to parks (Boone et al., 2009; Rigolon, 2016; Wolch et al., 2005).

We also used two other urban fabric variables describing a city's developmental timeline and its fiscal capacity, which might be latent factors confounding park equity findings. We included median age of housing as a proxy for a city's age: Cities with an older housing stock have likely been founded earlier and – due to the history of settlements in the U.S. – are likely to be located in the Northeast or Midwest (U.S. Census Bureau, 2000). Also, we used the percentage of vacant housing to model the degree to which cities are shrinking or experiencing economic growth (Couch & Cocks, 2013; Hollander, Johnson, Drew, & Tu, 2017). High-vacancy cities (e.g., Detroit, MI) are losing population and fiscal capacity due to a reduced tax base, and low-vacancy cities (e.g., San Jose, CA) have tighter housing markets and might be growing or gentrifying (Hyra & Rugh, 2016).

To understand whether park provision is equitable across cities, we used demographic variables describing median household income and the percentages of Non-Hispanic Blacks (henceforth Blacks) and of Hispanics-Latinos (henceforth Latinos) as measures of park need (Boone et al., 2009; Rigolon, 2017). Indeed, low-income people, particularly children and teenagers, might not be able to afford private recreation facilities and programs that charge high fees and to travel long distances to access parks outside of their neighborhood; thus, these populations need public parks and recreation facilities in their community more than wealthier people (Loukaitou-Sideris & Stieglitz, 2002; Romero, 2005). As such, an equitable park provision involves cities with higher need (lower income and larger shares of ethnic minority people) having higher quality park systems.

3.1.1. Validity and reliability of the ParkScore index

ParkScore is a composite index describing the quality of urban park systems developed by The Trust for Public Land (TPL). TPL is a U.S. nonprofit organization that seeks to build new parks in urban areas and to preserve wildland for ecological and recreational purposes (The Trust for Public Land, 2018). In addition to their work on the ground, TPL has also conducted extensive research and advocacy, including the development of ParkScore and other tools to inform policy, which exemplifies the growing role of nonprofits in the parks and recreation sector in the U.S. (Joassart-Marcelli et al., 2011; Pincetl, 2003). Other non-governmental organizations around the world have worked to preserve open space for conservation and recreational uses, including the Nature Conservancy, the World Land Trust, and several other smaller groups (Groves et al., 2002; Johnson, 2014; Kabii & Horwitz, 2006).

Although the Trust for Public Land's ParkScore has gained increased popularity in the U.S., its validity as a metric to operationalize the quality of urban park systems has not been proven. We make the argument that ParkScore is a valid instrument to measure the quality of urban park systems in U.S. cities because it was developed by a team of national experts over a period of almost ten years (content validity), it is statistically significantly correlated with health outcome variables linked to physical activity (criterion-related validity), and it has been widely used by practitioners and academics alike (practical validity).

Content validity describes the degree to which a measure includes all different aspects of a given concept, which often relies on the judgment of experts (Drost, 2011; Sullivan, 2011). TPL developed ParkScore through a multi-step process that involved numerous national experts in parks and recreation, an important condition for the content validity of an instrument (Drost, 2011; Sullivan, 2011). Table A1 in Appendix A describes the development of ParkScore.

Criterion-related validity is the level of agreement between the measure obtained from a tested instrument and one or more external measures, which are theoretically related to the construct the tested instrument is measuring (Drost, 2011). Since literature shows positive characteristics of individual parks are related to physical activity and positive health outcomes for people residing near such parks (see Markevych et al., 2017; Wolch et al., 2011), we expect that the quality of urban park systems (measured through ParkScore) is also related to physical activity and health at the city level. Indeed, Anglin, Mclean, and Smith (2016) found ParkScore is significantly associated with "obesity prevalence ($r = -0.641$, $p < 0.001$), type 2 diabetes prevalence ($r = -0.579$, $p < 0.001$), and leisure-time physical inactivity levels ($r = -0.523$, $p < 0.001$)" at the city level. We argue these moderate-to-high correlations in the expected directions provide evidence about the criterion-related validity of ParkScore as a measure of the quality of urban park systems (for a similar approach, see Besenyi et al., 2016; Edwards et al., 2013; Roubal et al., 2015).

Practical or pragmatic validity involves an assessment of the practical utility of an instrument (Kvale, 1995; Pellegrino, 1988). In other words, if an instrument is widely used in practice, an argument can be made about its pragmatic validity, as validity is socially constructed (Kvale, 1995; Pellegrino, 1988). To assess the practical validity of ParkScore, we conducted a web search to identify public and private agencies using ParkScore as an indicator, comments about the index by park professionals and elected officials reported in local news outlets, and peer-reviewed articles about parks mentioning ParkScore. We found ParkScore is widely used by U.S. professionals in parks and recreation, urban planning (see Tables A2–A4 in Appendix A), and academia (see Das, Fan, & French, 2017; Frey, 2017; Holifield & Williams, 2014; Lebron, Stoutenberg, Portacio, & Zollinger, 2016; Rigolon, 2017; Rigolon & Németh, 2018; Sharp, Sharp, & Miller, 2015).

Finally, the 2017 ParkScore release represents the sixth publication of such index, and TPL has developed a consistent methodology to measure features of urban park systems (The Trust for Public Land, 2017). This consistent methodology and the use of geospatial data collected from cities ensure the reliability of the index.

3.2. Statistical analyses

Bivariate correlations were used to give an initial picture of how demographic variables of interest and confounding urban fabric metrics relate to dependent variables describing the quality of urban park systems. Given high correlations – and resulting multicollinearity in multivariate models – we selected a subset of predictor variables for multivariate models (see Findings).

To investigate the relative importance of urban fabric and demographic variables, we used two-level fixed linear regression models that allowed us to differentiate the impacts of these components on the quality of urban park systems. Similar to a recent study on the distribution of street trees in Montréal, Canada (Pham, Apparicio, Landry, & Lewnard, 2017), we adopted a multi-level approach to uncover how variations in demographic variables added explanatory power to variables describing the urban fabric. We first entered three confounding variables characterizing a city's urban fabric, including percent drivers for sprawl, median age of housing, and percent vacant housing. In the second block, we entered predictors describing demographics, including median income, percent Black, and percent Latino. By doing so, we aimed to understand how much variance demographic variables could explain *in addition* to the variance accounted for by urban fabric variables. We tested for multivariate outliers by calculating the Mahalanobis distance (MD) for each city in regards to the values of its urban fabric and demographic variables along with its ParkScore index. Using a chi-square distribution with a critical alpha of 0.001 (df = 9), the Mahalanobis distance threshold was 27.88. These outlier tests were performed in R (version 3.4.2) with the "mvoutlier" package (version 2.0.9). All other analyses were performed in IBM SPSS Version 23.0 for Windows.

4. Results

Cities varied widely by features of the urban fabric (Table 2). Total population ranged from around a quarter million (e.g., Boise City, ID and Richmond, VA) to more than eight million (New York, NY). Population density also ranged considerably between 0.25 people per acre (Anchorage, AK) and 44 people per acre (again New York). The highest density cities also had some of the lowest percentages of residents driving to work (26% for New York and 38% for Washington, DC), but car commuting was much higher in most other cities. The median age of housing buildings varied between 18 and 79 years (see Table 1), with East Coast cities (e.g., Boston, MA) having significantly older housing stock than many cities in the West (e.g., Scottsdale, AZ). Housing vacancy varied from high percentages in shrinking cities located in the Midwest (28% for Detroit, MI) to very low shares in growing cities on the coasts (3% for Hialeah, FL; 4% for San Jose, CA).

Regarding demographics, our sample of cities included both those with high proportions of ethnic minority people and predominantly Non-Hispanic White municipalities. While some cities had less than 1% Black residents (i.e., Scottsdale, AZ) and less than 3% Latinos (Pittsburgh, PA), others were dominated by these underserved populations. For example, two cities had 95% Latino populations (Hialeah, FL; Laredo, TX), and one city had 78% Black residents (Detroit, MI). The average median household income matched the national average of approximately $56,000 (United States Census Bureau, 2017) but ranged broadly: from less than $30,000 (Cleveland, OH; Detroit, MI) to more than $120,000 (Fremont, CA).

The quality of urban park systems also varied in the sample (see Figs. 1–6). Park coverage averaged 12% but ranged from 1% (Hialeah, FL) to 84% (Anchorage, AK). The second and third most park-covered cities (Honolulu, HI and Fremont, CA) had only 33% and 37% coverage, respectively. Park spending per capita had a more even distribution across its range of $21–$279. Four cities spent $250 or more per capita (e.g., Seattle, WA; St. Louis, MO), and five spent less than $30 per capita (e.g., Detroit, MI; Stockton, CA). Regarding ParkScore ratings, the three lowest rated cities were Indianapolis, IN, Fort Wayne, TX, and Charlotte, NC. The three highest rated cities were Minneapolis, MN, St. Paul, MN, and San Francisco, CA.

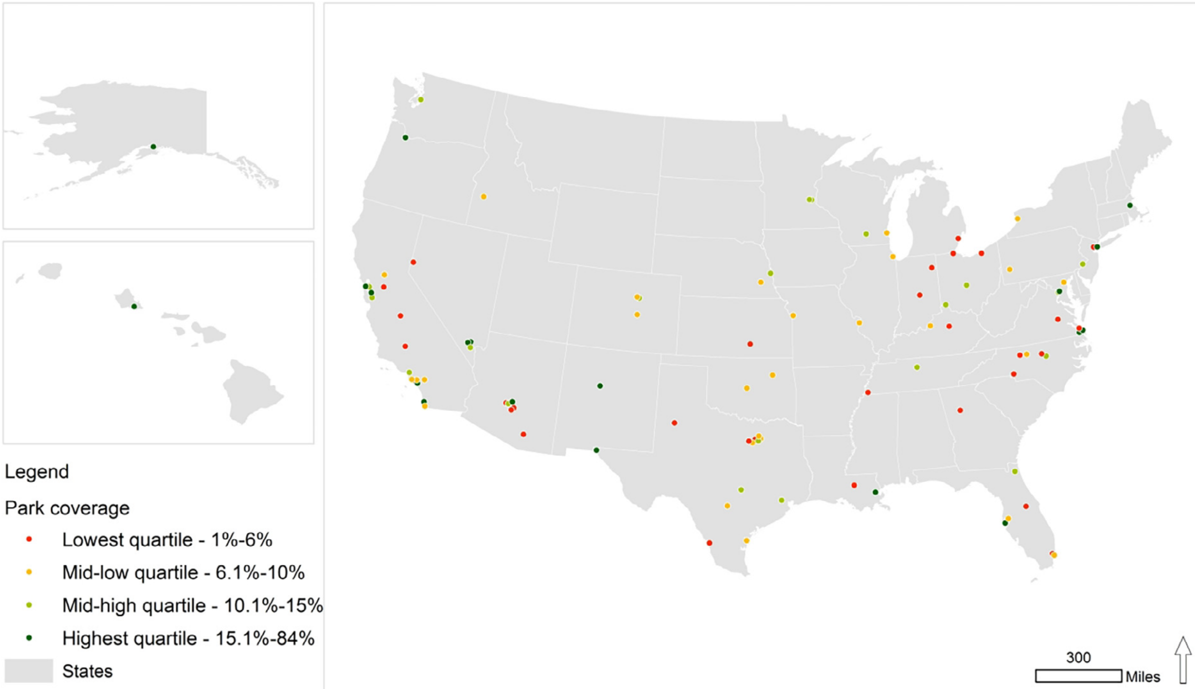

Fig. 2. Park coverage for the 99 cities: Parks as a percentage of the city surface.

Bivariate correlations confirmed variations in the quality of urban park systems were associated with variables describing the urban fabric and demographics (see Table 3). The strongest and most common correlations were observed for population density, percent drivers, and median age of housing. Percent drivers was associated with all six dependent variables describing the quality of urban park systems. Two of these (ParkScore index and park access) showed correlations with percent drivers above 0.5. Income and percent Latinos were each associated with three of the dependent variables, although the former showed stronger correlations than the latter.

To address multicollinearity in multivariate analyses, we selected a subset of predictor variables in multilevel models. In the initial models with all predictor variables, total population, population density, and percent drivers showed variance inflation factors (VIFs) above 5. We first removed total population, because it was not related to dependent variables in bivariate correlations, but the resulting models still displayed high multicollinearity. In particular, population density showed very high correlations with percent drivers, which further substantiates its use as a measure of urban sprawl (see also Sultana & Weber, 2007). Thus, we eliminated population density, which had the highest VIF, and

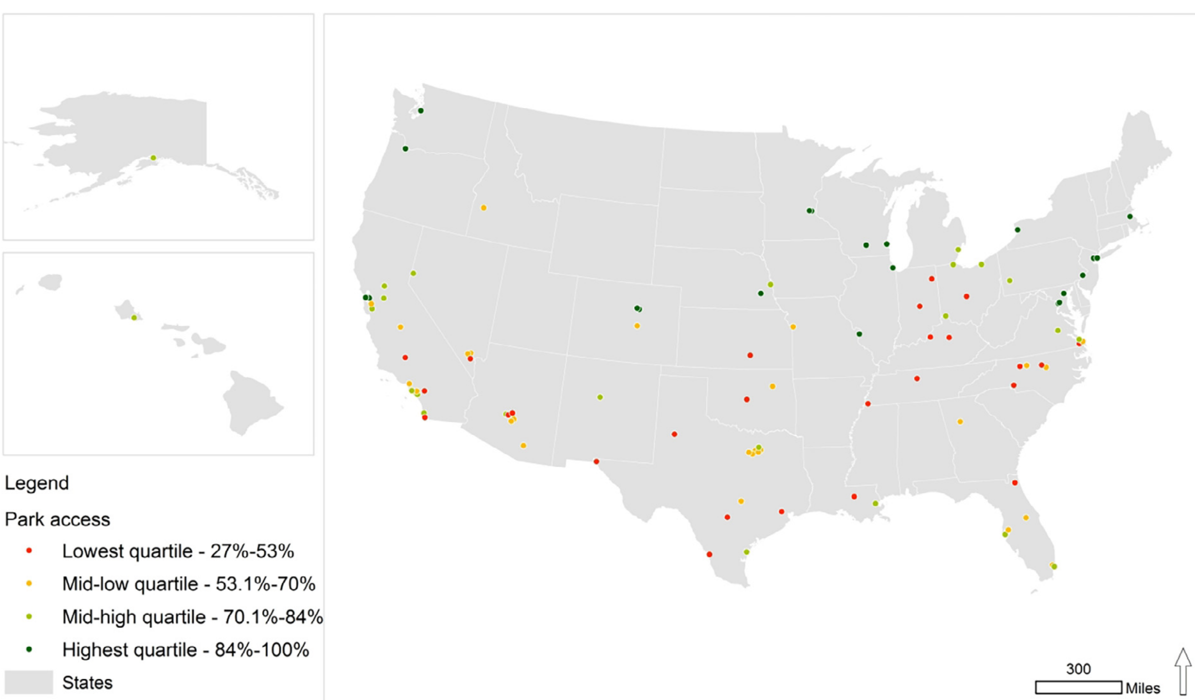

Fig. 3. Park access for the 99 cities: Percentage of people within a half-mile (800 m) of a park.

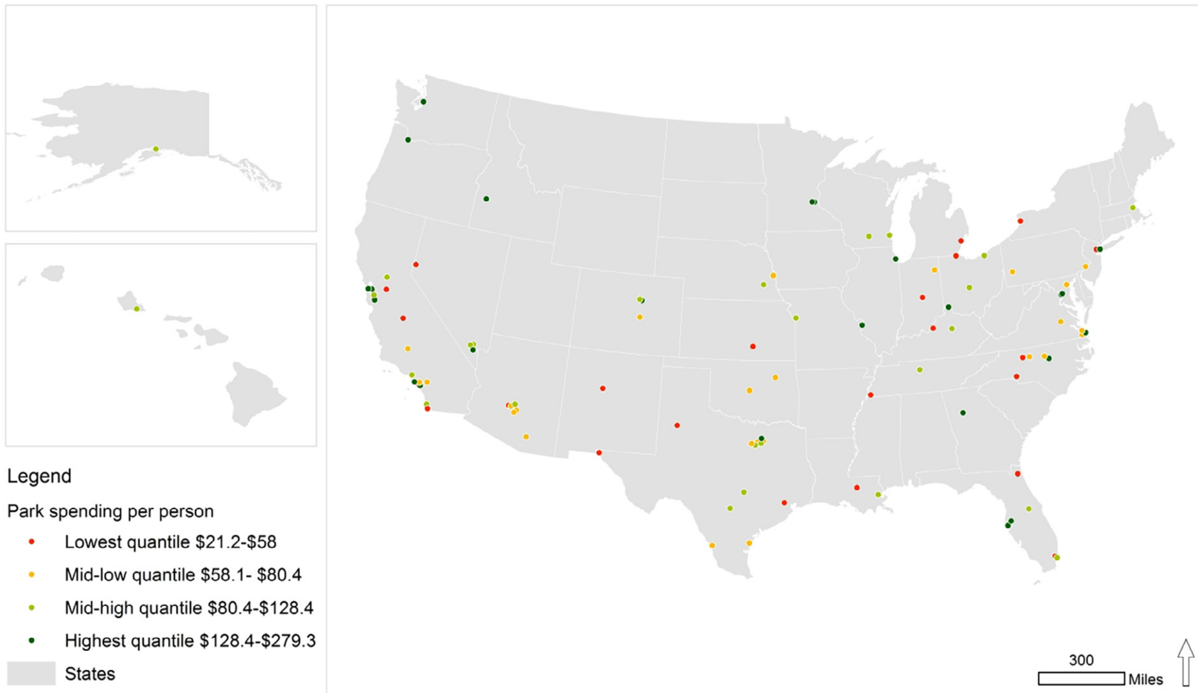

Fig. 4. Park spending per person in U.S. dollars.

the remaining variables displayed VIFs below the threshold of 3 (Field, 2013).

Multivariate analyses also showed urban fabric and demographic characteristics were associated with all dependent variables (see Table 4). F-statistics comparing regression model fits were statistically significant between the first block, which only included features of the urban fabric, and the second block, which also included demographic variables describing income and ethnicity, for all six dependent variables. This finding shows models with all predictor variables explained variance in the dependent variables better than models with only urban fabric variables. The amount of variance explained by predictors ranged from 18% (access inequality) to 58% (access).

Percent drivers remained the most consistent predictor of dependent variables. This variable showed significant or marginally significant correlations with four of the six dependent variables; only park coverage and access inequality were not associated with percent drivers in the second block. Its strongest relationships were with park access and ParkScore. Percent drivers was negatively associated with all but one of the dependent variables (access inequality), suggesting cities with more car commuters have lower quality park systems, less access, less

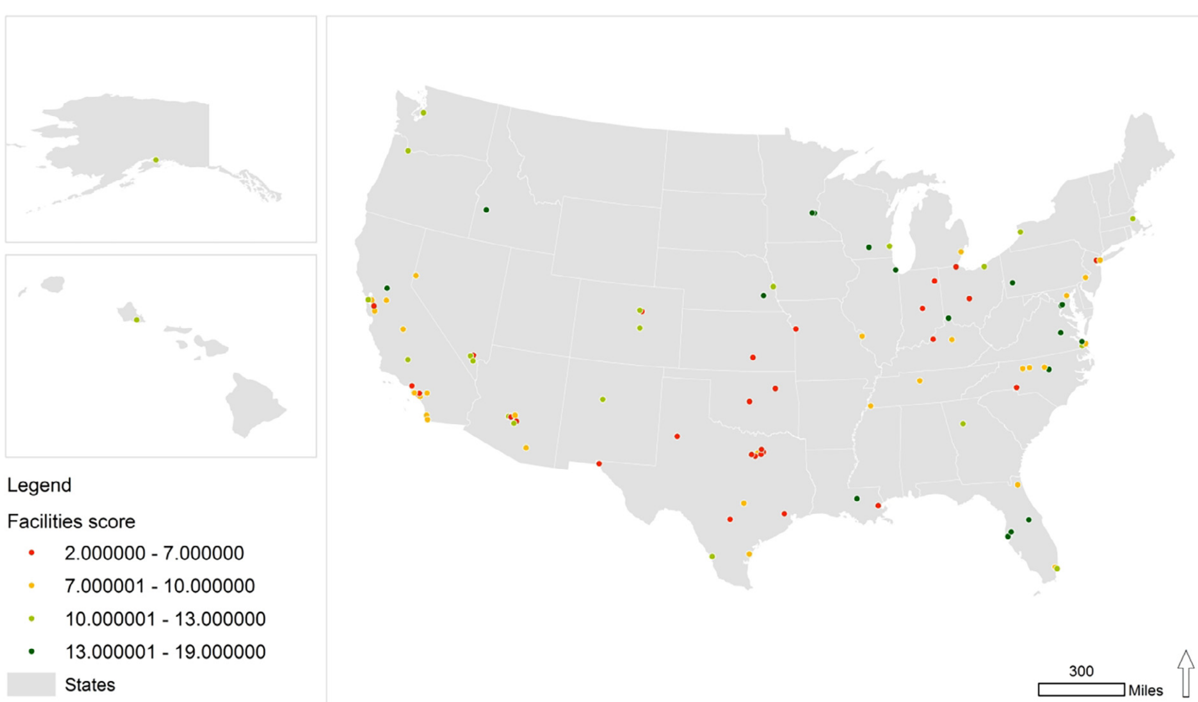

Fig. 5. Facilities score for the 99 cities: Average number of park facilities per person.

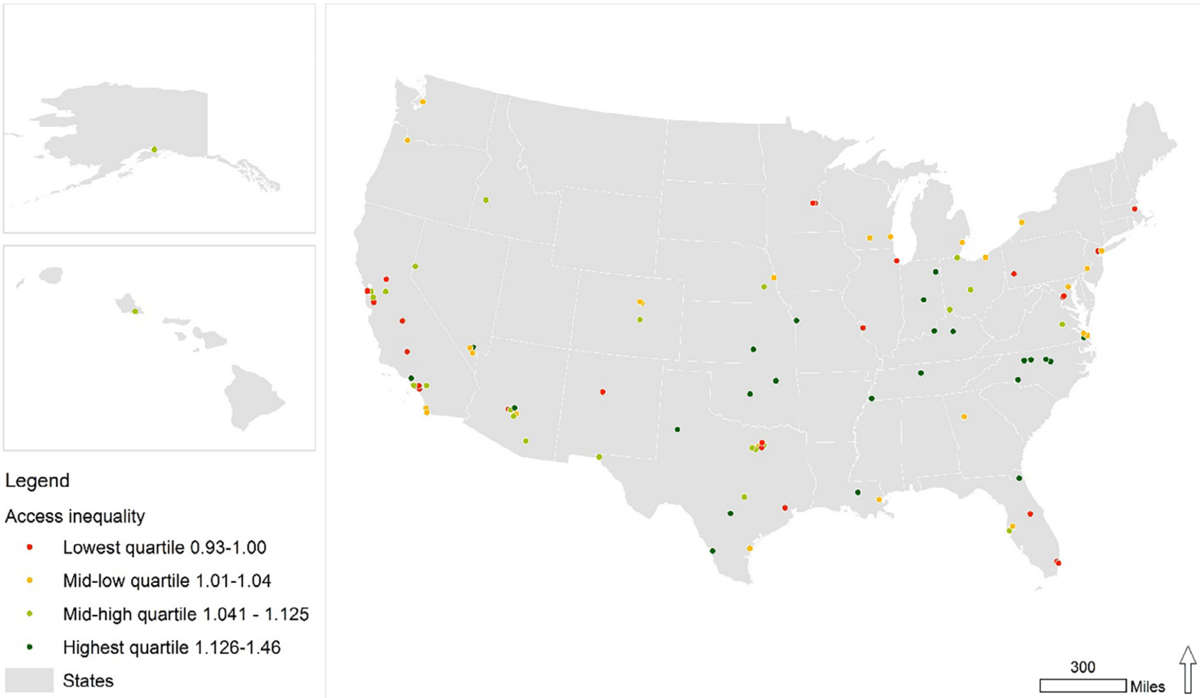

Fig. 6. Access inequality for the 99 cities: Values lower than 1 denote unequal access.

Table 3
Bivariate Correlations between Independent Variables (IV) and Dependent Variables (DV).

	IV 1	IV 2	IV 3	IV 4	IV 5	IV 6	IV 7	IV 8	DV 1	DV 2	DV 3	DV 4	DV 5	DV 6
Population (IV 1)	1	**.562****	**−.419****	**.201***	−.006	−.001	.016	.106	.123	.102	.109	.112	−.143	−.057
Population density (IV 2)		1	**−.824****	**.534***	−.063	0.122	.029	.174	**.358****	.035	**.600****	**.261****	.101	**−.394****
Percent drivers (IV 3)			1	**−.631****	−.075	**−.224***	−.177	.195	**−.563****	**−.202***	**−.693****	**−.441****	**−.328****	**.289****
Median age of housing (IV 4)				**1**	**.345****	**−.250***	**.470****	**−.269****	**.351****	−.013	**.631****	**.221***	**.257***	**−.256***
Percent vacant housing (IV 5)					**1**	**−.453****	**.680****	**−.368****	−.119	.003	.025	−.094	.078	.091
Median income (IV 6)						1	**−.464****	−.130	**.461****	**.459****	.141	**.481****	.071	−.147
Percent Blacks (IV 7)							1	**−.476****	−.082	−.139	.066	−.043	.125	.102
Percent Latinos (IV 8)								1	**−.330****	−.186	−.148	**−.296****	**−.339****	−0.184
ParkScore (DV 1)									1	**.444****	**.744****	**.794****	**.568****	**−.457****
Park coverage (DV 2)										1	.191	**.241***	.115	−.006
Park access (DV 3)											1	**.477****	**.435****	**−.653****
Park spending per person (DV 4)												1	**.412****	**−.307****
Facilities score (DV 5)													1	−0.169
Access inequality (DV 6)														1

Table shows Pearson correlation coefficient values and significance values, $^{*}p < .05$, $^{**}p < .01$, $^{***}p < .001$, statistics significant at $p < .05$ are displayed in bold.

spending, and fewer park facilities than cities with fewer car commuters. Median age of housing was positively associated with ParkScore and park access, which suggests older cities have higher quality park systems and better walking access to parks than newer cities.

Median income remained significant for three dependent variables in multivariate analyses. As household income increased in a city, ParkScore, park coverage, and park spending per person increased, on average. Multivariate analyses also showed cities with larger percentages of Latino residents had lower quality park systems. Specifically, percent Latinos was significantly and negatively related to ParkScore ($p < 0.01$) and facilities score ($p < 0.01$). Percent Latinos was also negatively associated with access inequality ($p < 0.05$); in predominantly-Latino cities, low-income neighborhoods had worse walking access to parks than their city as a whole, when compared to municipalities with lower percentages of Latinos. Thus, as percent Latinos increased, many positive characteristics of park systems – their overall quality (ParkScore), their facilities, and access for low-income communities – decreased.

Similar to bivariate correlations, the percentage of Black residents in cities did not display a notable association with dependent variables. The ParkScore index and park access showed marginally significant and negative associations with percent Black ($p < 0.10$). These results suggest cities with relatively higher Black populations may have lower quality park systems and poorer walking access to parks than other cities.

Specific park facilities also showed associations with certain demographic characteristics (Table 5). For instance, percent Latinos was marginally and negatively associated with the numbers of basketball hoops. A higher percentage of Latinos was linked to fewer playgrounds and dog parks, on average. These findings confirm predominantly Latino cities experience more park inequities that predominantly Black cities. In contrast to previous models, income was predictive of relatively few facilities – only the number of basketball hoops per capita was significantly related. Also, the percentage of Black residents

Table 4
Results of Multivariate Linear Regressions for the Six Dependent Variables.

		Standardized Beta Coefficients					
		ParkScore	Park coverage	Park access	Park spending per person	Facilities score	Access inequality
Block 1	Percent drivers	**−0.524***	**−0.366**	**−0.455***	**−0.473***	**−0.283***	**0.234^**
	Median age of housing	0.085	**−0.268^**	**0.395***	−0.036	0.067	−0.166
	Percent vacant housing	**−0.187***	0.068	**−0.145^**	−0.118	0.034	0.166
	R^2	0.347	0.077	0.561	0.211	0.113	0.134
	R_{adj}^2	0.327	0.049	0.547	0.186	0.085	0.107
Block 2	Percent drivers	**−0.314**	−0.069	**−0.402***	**−0.209^**	**−0.303***	0.181
	Median age of housing	**0.276***	0.024	**0.489***	0.171	0.016	−0.245
	Percent vacant housing	−0.053	**0.308***	−0.013	−0.015	−0.053	0.063
	Median income	**0.290**	**0.499***	0.063	**0.432***	−0.134	−0.158
	Percent Blacks	**−0.234^**	−0.174	**−0.215^**	−0.033	−0.143	−0.058
	Percent Latinos	**−0.287**	−0.070	−0.036	−0.174	**−0.381**	**−0.257***
	R^2	0.528	0.281	0.587	0.392	0.210	0.176
	R_{adj}^2	0.497	0.234	0.560	0.353	0.149	0.122
	F statistic	**17.127***	**5.986***	**21.799***	**9.899***	**3.865**	**3.278**

Table shows results of a two-step linear regression analysis, $^{\wedge}p < .10$, $^{*}p < .05$, $^{**}p < .01$, $^{***}p < .001$, statistics significant at $p < .10$ are displayed in bold.

Table 5
Results of Multivariate Linear Regressions: The Numbers of Different Facilities are Considered as Additional Dependent Variables.

	Standardized Beta Coefficients			
	Basketball hoops[a]	Dog parks[b]	Playgrounds[a]	Recreation & senior centers[c]
Percent drivers	−0.230	**−0.391**	0.077	−0.214
Median age of housing	0.027	−0.229	0.086	0.067
Percent vacant housing	−0.102	−0.093	−0.026	−0.063
Median household income	**−0.342***	−0.190	−0.079	0.009
Percent Blacks	−0.162	**−0.396**	−0.161	**0.306^**
Percent Latinos	**−0.249^**	**−0.481***	**−0.435**	0.054

Table shows results of linear regression analysis, [a]per 10,000 residents, [b]per 100,000 residents, [c]per 20,000 residents, $^{\wedge}p < .10$, $^{*}p < .05$, $^{**}p < .01$, $^{***}p < .001$, statistics significant at $p < .10$ are displayed in bold.

showed significant relationships with two park facilities: dog parks (negative) and recreation and senior citizen centers (positive).

A few exemplary cities provide useful context for these findings. For instance, Fort Wayne, IN and Indianapolis, IN, the two cities with the lowest ParkScores (28.5) and very low percentages of people within a 10-minute walk of a park (44% and 32%), also have some of the highest percentages of drivers (93% and 92%), reflecting the trends seen in Table 4. Also, the two municipalities with the third and fourth highest ParkScores – San Francisco, CA and Washington, DC (80 and 79) – also have some of the lowest percentages of people driving to work (40% and 38%). Regarding inequities based on demographic characteristics, San Francisco, CA is also exemplary of cities with high ParkScores (80), high median income ($103,801), and low percentages of Latinos (15%) and Blacks (5%). On the other hand, Hialeah, FL and Baton Rouge, LA are representative of municipalities with low ParkScores (33.5 for both), low median income ($30,495 and $38,470), and high percentages of ethnic minority people (95% Latinos for Hialeah and 55% Blacks for Baton Rouge).

Three cities were identified as outliers largely due to their unique sprawl characteristics, income levels, and ethnic composition, yet they did not influence the results of the models. Removing these three cities resulted in largely the same multivariate findings as those reported for the entire sample. Among the outliers, New York, NY (MD = 73) had the lowest percent drivers (26%) and the highest population density (44 people per acre) of any city. Honolulu, HI (MD = 53) showed low percentages of Whites (15%), Blacks (1%), and Latinos (7%) and a higher share of Non-Hispanic Asians (56%). And Fremont City, CA (MD = 29) had the highest median household income ($122,419) in the sample, a relatively low share of Whites (20%), and a large percentage of Non-Hispanic Asians (58%). Interestingly, neither ParkScore nor its components were unusually high or low in multivariate outliers, suggesting the uniqueness of cities was more dictated by their extreme demographics and urban fabric characteristics than the quality of their park systems.

5. Discussion

Our study contributes to the growing EJ literature on urban green spaces by documenting inequities in the quality of urban park systems between cities in the U.S. We found affluent majority-White municipalities have higher quality park systems than those with larger concentrations of low-income ethnic minority people, and predominantly Latino cities are more disadvantaged than predominantly Black municipalities. We also uncovered cities with higher shares of Latinos have significantly higher neighborhood-level socioeconomic inequities in walking access to parks than cities with lower percentages of Latino residents. Our findings on inequities in park funding and park coverage resemble those of other city-level studies in parts of the United States (Joassart-Marcelli, 2010) and China (Chen et al., 2017).

The literature on the political economy of parks sheds light on the reasons of the city-level inequities we highlight. First, U.S. cities characterized by compact urban fabrics, where fewer people drive to work, might have better walking access to parks and more park facilities because green space can improve quality of life in dense urban areas (Chiesura, 2004). Indeed, some studies showed older and denser neighborhoods have better walking access to parks than more recent suburban districts, as the former were developed to support pedestrian mobility while the latter were planned as car-dependent areas (Boone et al., 2009; Rigolon, 2016, 2017). Second, variations in fiscal capacity can help explain socioeconomic disparities in park provision. Wealthier cities can spend more on their park systems than cash-strapped cities (Joassart-Marcelli, 2010) and will likely do so to increase land values (Smith & Floyd, 2013). Also, because cities use high-quality park systems to attract tourists and affluent new residents (Braiterman, 2010), wealthier municipalities might invest more in their parks.

The findings of this investigation also align with trends emerged in studies focusing on neighborhood-level inequities in the U.S. and other Global North countries. Similar to many neighborhood-level studies in these contexts (Boone et al., 2009; Rigolon, 2017; Vaughan et al., 2013; Wolch et al., 2005), we found affluent White cities have more acres of parks and more park facilities than low-income ethnic minority cities, and results were mixed for walking access to parks. This suggests neighborhood-level inequities in park provision might scale up to inequities across cities.

Thus, our approach and results build a strong argument to expand EJ scholarship and advocacy for urban green spaces to national cross-city analyses. Scaling up analyses is particularly important due to the aforementioned changes in park funding mechanisms and scales, as cities in the U.S. are increasingly competing for grants to support urban green space (Joassart-Marcelli et al., 2011). Indeed, lower-income ethnic minority cities in the U.S. could use these results to advocate for funding from nonprofits, states, and federal agencies to bring their park system up to par with wealthier and Whiter municipalities. These funding shifts have been particularly notable in the U.S., where cities increasingly rely on competitive grants for other environmental amenities, including urban trees and active transportation projects (Miller & Coutts, 2018; Perkins, 2011). But scaling up the analysis of green space provision to the city level is important beyond the U.S., as competitive grants for parks administered by public agencies and nonprofits also exist the United Kingdom (U.K. Ministry of Housing Communities & Local Government, 2012), Canada (Park People, 2018), and Australia (Government of South Australia, 2018).

5.1. Implications

This study has important implications for landscape planning, public policy, and grant-making. Municipal park agencies in the U.S. can use our approach and results to compare their park systems to those of cities with similar urban fabrics and demographics. These comparisons can highlight some specific deficiencies within their park systems based on park acreage, access, or facilities, and help them prioritize future investments (see Rigolon, 2016). For example, inequities in park acreage are the hardest to address, as cities need to purchase significant amounts of land, leverage partnerships with other public agencies such as school districts, or require developers to dedicate parkland in new subdivisions (Rigolon, 2016; Wolch et al., 2014). Rectifying city-level inequities in the number of park facilities per capita might be more feasible because adding facilities does not necessitate the acquisition of new parkland (Dahmann et al., 2010; Rigolon, 2016).

Our analysis can also help public and nonprofit funding agencies prioritize cities for park grants. Our integration of city-level data on park provision (ParkScore) and park need (demographics) provides funding agencies with a clear picture of inequities across cities. Therefore, grant-makers can distribute park funding to various cities based on their gaps in park provision (acreage, access, or facilities), the citywide level of park need, and the specific recreation needs of different communities. To this extent, efforts to address citywide inequities in urban park systems should *also* seek to tackle neighborhood-level inequities. Indeed, the State of California has distributed park funding through competitive grants (e.g., Proposition 84) that prioritized park-poor, low-income neighborhoods (Christensen, 2016). Findings from our study suggest grant-makers should particularly prioritize underserved neighborhoods that are also located in park-poor and low-income cities. For example, cities like Fresno, CA, which has more than 20 low-income neighborhoods without a park (ranked 90th in ParkScore), should receive priority over cities like Irvine, CA, which includes significantly fewer park-poor, low-income communities (ranked 7th in ParkScore; The Trust for Public Land, 2017).

5.2. Limitations and future research

This investigation has a series of limitations that can be addressed by future research. First, we only limitedly focused on socioeconomic differences within cities through the access inequality index. Subsequent studies could analyze how city-level demographic variables are associated with neighborhood-level differences in park acreage, access, and facilities. Second, the quality of today's urban park systems is likely the result of several decades of investment or disinvestment. Demographic data for 2016 might not fully reflect how wealthy and ethnically diverse cities have been during the formative periods of their park systems. Ensuing investigations could use historical U.S. Census data and calculate average values for income and ethnicity. Third, ParkScore metrics do not include city-owned vacant land that resulted from foreclosures and disinvestment in many U.S. shrinking cities. Although vacant land is not dedicated to recreational uses, future work could evaluate how such land contributes to green space coverage across cities. Fourth, further studies could examine the ecosystem services provided by parks are equally distributed across cities in different ecological regions (e.g., East Coast and West Coast). Finally, future investigations could analyze whether park inequities across cities exist in other countries with different sociopolitical systems.

6. Conclusion

In this study, we examined associations between the quality of urban park systems and citywide demographic characteristics for some of the largest cities in the United States. This analysis was motivated by the health benefits of parks and by shifts in funding mechanisms and scale that have led cities to compete for national and state grants for parks. Our findings highlight notable inequities in the quality of urban park systems across U.S. cities, which confirms income-based disparities for park coverage emerged between Chinese cities (Chen et al., 2017). Given increasing urbanization around the world, our findings raise significant concerns about the potentially negative impacts of cross-city park inequities on human health and well-being. As such, it is particularly important to analyze park inequities in Global South countries, many of which are experiencing rapid urbanization and uneven patterns of development (i.e., planned cities and informal settlements).

From the theoretical standpoint, this paper demonstrates the importance of scaling up EJ analyses of park provision to cross-city comparisons. As cities in the U.S. and other Global North countries increasingly compete with each other to secure park grants, funding agencies should be aware of how their work contributes to increasing or reducing cross-city park inequities. This study expands our understanding of EJ issues related to urban green space and can effectively inform equity-oriented efforts to address injustice.

Appendix A

Tables A1–A4

Table A1
Steps of the Development Process of the ParkScore Index.

Years	Steps of the Development Process
2001–2003	The Trust for Public Land (TPL) organized a symposium during which a panel of 25 experts in parks and urban planning developed seven criteria for an "excellent city park system" that were presented in a report (Harnik, 2003). A survey with the directors of 69 public park agencies was used to develop indicators for the seven criteria (Harnik, 2003).
2004–2011	TPL's Center for City Park Excellence (CCPE) consulted national experts to further develop these criteria for almost another decade, including surveys with U.S. public park agencies (Charlie McCabe at CCPE, personal communication).
2012	TPL's CCPE released the first version of the ParkScore index in 2012, which covered the largest 40 cities in the U.S. (The Trust for Public Land, 2017). To calculate the index, TPL has conducted yearly surveys with public park agencies to gather data about park geographies, spending, and facilities (The Trust for Public Land, 2017). TPL then uses geographic information systems to calculate additional metrics such as park acreage and walking access to parks.

Table A2
Examples of Cities and Other Agencies that Used ParkScore as an Indicator.

Agency	ParkScore as Indicator
City of Albuquerque, NM	ParkScore and some of its sub-categories as indicators for sustainability. Progress is monitored every year. The city's ParkScore is compared with its "peers."
City of Austin, TX	Indicator for the performance of the park system. Started in Fiscal Year 2015–2016, tracked over time. ParkScore considered as "a standard for park excellence."
City of Birmingham, AL	A "park quality" indicator was developed based on ParkScore: "Park Quality evaluates how cities are meeting the need for parks based on acreage, facilities and investment, and access." ParkScore values for neighborhoods are calculated.
City of Colorado Springs, CO	ParkScore as a "performance measure" for the city's park system. The city's ParkScore is compared with similar cities.
Government of the District of Columbia Department of Health	ParkScore is used as a metric for health promotion among older adults and tracked over time. The goal is to "Ensure all residents have access to parks and open spaces with 1/2 mile."
Center for Houston's Future: The Region's Think Tank	ParkScore as an indicator for the parks and trails. Houston's ParkScore compared with other cities.
Miami-Dade County, FL	ParkScore is one of the metrics for the "Quality of Life" component of the strategic plan.
City of New Orleans, LA	ParkScore as an indicator for "Objective 4–2: Promote and maintain quality neighborhoods and green spaces." The city's ParkScore is compared with "peer cities." Tracked over time.
San Diego Council of Governments, CA	"Park Quality is measured using ParkScore, a comprehensive rating system developed by the Trust for Public Land that evaluates how cities are meeting the need for parks based on acreage; service and investment; and access."
St. Joseph Health	ParkScore is an indicator in the 2017 "Community Health Needs Assessment" measuring "how well cities are meeting the need for parks."
U.S. Department of Housing and Urban Development	The park access component of ParkScore is an indicator for "Equitable Development: Access to open space." ParkScore suggested as data source for data on parks.
City of Wildwood, FL	The city looks at examples of park plans developed by cities that rank high on ParkScore.

Note: In the search, we used the following expression "ParkScore" AND ("indicator" OR "metric"). We stopped after four pages of results. The links to the webpages are embedded in the agency names as hyperlinks.

Table A3
Results of Google Searches Combining "ParkScore" and a City's Name.

2017 ParkScore Rank	City	Number of Pages Found	Local News Coverage*
1	Minneapolis, MN	10,900	Yes
2	St. Paul, MN	1830	Yes
3	San Francisco, CA	429,000	Yes
4	Washington DC	433,000	Yes
5	Portland, OR	428,000	Yes
6	Arlington, VA	1320	Yes
7	Irvine, CA	2530	Yes
7	New York, NY	432,000	Yes
9	Madison, WI	1960	Yes
10	Cincinnati, OH	425,000	Yes
45	Cleveland, OH	427,000	Yes
46	Austin, TX	426,000	Yes
47	North Las Vegas, NV	263	Yes
48	Miami, FL	1570	Yes
48	Richmond, VA	2020	Yes
50	Atlanta, GA	2350	Yes
50	Dallas, TX	1740	Yes
52	Chesapeake, VA	1710	Yes
53	Baltimore, MD	5260	Yes
53	Nashville, TN	4780	Yes
53	Orlando, FL	2210	Yes
90	Fresno, CA	1490	Yes
90	Hialeah, FL	380	Yes
90	Jacksonville, FL	803	Yes
93	Laredo, TX	466	Yes
93	Winston-Salem	1610	Yes
95	Mesa, AZ	1070	Yes
96	Louisville, KY	1190	Yes
97	Charlotte, NC	5890	Yes
98	Fort Wayne, IN	1150	Yes
98	Indianapolis, IN	1770	Yes

* Includes television, newspaper, magazine, or blog.

Table A4
Comments about ParkScore Made by Members of Public Park Agencies, as Reported in the Local News.

2017 ParkScore Rank	City	Comments about ParkScore
1	Minneapolis, MN	"Minneapolis Edges out Saint Paul as Nation's Best Park System, According to The Trust for Public Land's 2016 ParkScore Index." "We're honored by the top ranking, but not resting on our laurels. We are working continuously to improve our parks." Positive attitude. Top of the ranking.
3	San Francisco, CA	"I am so proud of the work we do as a City to ensure that we build and maintain incredible parks and that all residents have access to them. We continue to improve, and stay at the top of the list. This score validates that." Positive attitude: San Francisco consistently ranks high.
20	Denver, CO	"The city is working hard to ensure Denver's open spaces are accessible, growing, and a continued source of pride. Denver will continue to support the very active, healthy lifestyle of the people who live, work, and play here by providing accessible parks […] for all our neighborhoods." Accepting attitude about Denver's high score. Constructive attitude to improve the park access score.
24	Las Vegas, NV	"When we look at parks and facilities, we look at them as how do they add to that iconic nature (of the city). So quantity might be something we struggle with, but quality is something we focus on." Accepting attitude: Las Vegas needs to improve in median park size and park access.
24	Long Beach, CA	"I'm delighted to see that our efforts to create parks where residents can play, relax and enjoy nature have been recognized. The City has worked hard to improve Long Beach parks." Positive attitude: Long Beach has improved its score and ranking.
50	Atlanta, GA	"Atlanta's improving ParkScore rating represents years of dedication from the community, non-profit organizations, local business, and committed elected officials working to ensure that Atlanta residents have access to world-class parks." Positive attitude: Atlanta has improved its score and ranking.
50	Dallas, TX	"We need to be buying land. We have almost no money for land acquisition." Commenting on the relatively low score for park acreage. Accepting attitude.
56	Columbus, OH	"It's not necessarily the most encouraging, but it does kind of give us an idea of where we are." […] "We're on a mission to get a Metro Park within 5 miles of every doorstep in Franklin County." Accepting attitude: The city is not ranking well, but they know there is work to do.
71	Bakersfield, CA	"We have a very low density. We're not piled on top of each other. We're spread out, so our parks are spread out. In other words, a city like San Francisco is going to get a higher park score because their city is so dense and nearly everyone is near a park." Accepting attitude: The city low population density negatively affects the park access score.
85	Tucson, AZ	"The most glaring deficiency is parkland in general. But we've identified a list of needs we'll try to secure funding for in the future." Accepting and constructive attitude: Tucson needs more acres of parks.
88	Oklahoma City, OK	"Because [ParkScore] uses comparative data, we are consistently measured against cities that are more densely populated and often have more natural resources for recreation opportunities." Partially negative attitude: The city low population density lowers the park access score.
90	Fresno, CA	"While this report tells us where we've been, we're encouraged by where we're going. We've increased our parks budget by almost $11 million over the past two years […] and have partnered with our local school districts to provide access to 14 school sites for added recreational opportunities." Positive and accepting attitude: Fresno has improved its score and ranking.
97	Charlotte, NC	"Comparisons are interesting, but should not be used as a driver to meet local needs. We do need more parks, greenways, centers and a host of other amenities. We're making progress and have great support from citizens, elected officials and our county administration." Accepting but partially negative attitudes: Awareness that Charlotte needs more parks, but the city needs to work with residents.
98	Indianapolis, IN	"We probably need to do a better job on the council of prioritizing parks. There are ways we can prioritize this need and make it better. […] We have work to do." Accepting but constructive attitude: Indianapolis wants to improve from the last place.

Note: The links to the local news are embedded in the city names as hyperlinks.

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