Trees and Trash: Examining the Link Between Urban Forest Engagement and Blight in Atlanta, Georgia, United States

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Abstract

Research conducted in various contexts suggests that urban greenspace, primarily trees, helps to reduce crime rates and other negative aspects of place. This study contributes to that literature by examining residents' reporting of activities they do to create, maintain, and protect the urban forest in Atlanta, Georgia (USA), and the association of this involvement with blight measures. Using binary logistic regression, we found that urban forest engagement did not mediate egregious blight conditions but did reduce the presence of litter. Rather, residence in predominantly African American communities was the most consistent predictor of more substantial indicators of blight. Except for litter, these are overwhelming conditions, often involving absentee property owners. Redress requires municipal-level, bureaucratic

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interventions, which can be complex. Urban forest engagement appears relatively ineffectual in combating the worst kinds of blight but may aid in reducing more pedestrian forms.

Introduction

Trees and other vegetation in cities have been shown to promote a greater sense of psychological and emotional well-being (South et al., 2018; Svendsen, 2009), to improve human cardiovascular functioning (Kondo et al., 2018), and to improve social relations among residents living in public housing communities (Kuo et al., 1998). As well, studies have found an inverse association between a wide range of reported criminal activity and urban vegetation (Branas et al., 2011; Kuo & Sullivan, 2001; Schusler et al., 2018). In this study, our point of departure is an examination of the association between people's engagement with the City of Atlanta's urban forest (defined as the network of trees and other vegetation across cityscapes) and household measures of blight, operationalized as damaged houses and other structures, illegally dumped garbage, discarded furniture, discarded tires, junk cars, abandoned houses, litter, and lack of code enforcement.

Similar to other studies (Gilstad-Hayden et al., 2015; Troy et al., 2012; Troy et al., 2016; Wolfe & Mennis, 2012), we argue that people's *participation in and with greenspace* is a crucial factor in this relationship. This interaction can occur when greenspace serves as a physical location for positive, social interaction or when humans are motivated to care for and protect both mundane, urban open spaces, and those of particular socioecological significance (Ernstson, 2013; Johnson Gaither, 2019; Kuo et al., 1998; Locke et al., 2016; Murphy-Dunning, 2009). For instance, in the University of Illinois's series of studies on resident responses to greenspace in Chicago housing projects, findings indicated that crime rates for both property and violent crimes were lower around buildings with more trees. Researchers argued that residents' presence in these out-of-doors spaces functioned as informal surveillance of the neighborhood, contributing to crime reduction. These treed areas served as a space for community gatherings, which helped to increase neighborhood social ties (Coley et al., 1997; Kuo et al., 1998; Kuo & Sullivan, 2001). Also, Kondo et al.'s (2016) study of crime reduction related to vacant lot greening and reuse proposed that crime reduction near community gardens and orchards occurred because these uses required residents' time and attention. Residents were actively involved in the restoration and maintenance of these spaces.

Our research is distinguished from the extant literature in that we make an explicit link between community engagement with urban trees and meaning generation: As such, we draw theoretically from symbolic interactionism, which posits that

people both create and assign meanings to the material world, and that they act toward physical objects and spaces based on these assigned meanings (Blumer, 1969). Related, this study also draws from Lee's (1972) proposition that human behavior toward an environment can be understood best in terms of the meanings people assign to spaces and places. What this indicates for the present study is that when people purposefully create, maintain, and advocate for urban trees and other greenspaces, the places where this engagement takes place are imbued with positive associations and meaning.

Kondo et al.'s (2016) study and similar others rest on the assumption that crime rates go down after neighborhoods are greened. However, it may be that neighborhood greening projects can reduce crime rates, or, in the case of the present study, blight, a priori. We suggest that blight is less likely in neighborhoods and communities where people routinely participate in activities to recognize, maintain, and promote urban forest, other factors remaining constant. Importantly, this engagement signals (i.e., conveys the meaning) to neighborhood residents and others that these spaces are to be respected; they are not receptacles for refuse but should be protected (Brown & Bentley, 1993). Troy and colleagues (2012, 2016) refer to this scrutiny as the "cue to care" or "eyes on the street" explanation of urban greening benefits. However, neither of these explanations make explicit reference to meaning. It is only implied.

In addition to human ecology, our study also has implications for the social justice and geography of justice literatures because efforts to mediate urban blight can have the unintended consequence of stimulating gentrification (Branas et al., 2016). We address this issue in the discussion and conclusion section.

Study objectives

To examine the association between urban forest engagement (UFE) in Atlanta, we specify seven binomial logistic models where UFE is a predictor of the respective inventoried blight measures, along with four sociodemographic control variables. We examine this association further by modeling resident responses to questions about neighborhood social stressors, two of which are blight proxies—lack of code enforcement and illegal trash dumping. UFE is defined as any positive activity engaged in by ordinary residents to establish, maintain, or protect urban forests.

Apart from the regression models, we examine the relationship between tree canopy cover and the respective blight indicators across five sociodemographically demarcated strata in the city using chi-square analyses. This analysis is presented to show the association between physical aspects of the urban forest and blight by subarea of the city. Based on the above-referenced studies showing positive associations between urban tree cover and social outcomes, we expect to find an inverse association between blight and canopy cover across the city.

Study area

The setting for the study is the City of Atlanta, which encompasses an area of 342.9 square kilometers (132.4 square miles; 342.9 hectares) in the United States (US) state of Georgia. In 2018, the city had an estimated population of 498,044 (US Census Bureau, 2019b). The larger, Atlanta–Sandy Springs–Roswell, Georgia Metropolitan Statistical Area (metro Atlanta), of which the City of Atlanta is a part, is the largest metropolitan area in the state of Georgia and has the ninth largest population of any metropolitan area in the country (US Census Bureau, 2019a). Metro Atlanta is the premier southern metropolis in terms of economic growth and cultural distinctiveness. Since the early 1980s, the Atlanta metro region has emerged as a destination city for immigrant groups from around the country and the world. Immigration to Atlanta suburbs has created distinctive ethno-racial communities that defy historical black–white bifurcations (Hernández-León & Zúñiga, 2000; Walcott, 2002; Yarbrough, 2007). The Atlanta region has also been dubbed the African American "mecca," attracting tens of thousands of professional-class African Americans to its suburban counties (Frey, 2004). Observers note that the region's economic growth has occurred disproportionately in the northern, upper-income suburbs, which include some of the same towns and counties that have undergone significant racial and ethnic diversification over the past 30 years (Henderson, 2004, p. 199).

Literature review

Atlanta's blight problem

Blight is a multidimensional phenomenon that can take a variety of forms and span the rural-to-urban continuum. The Metropolitan Institute at Virginia Polytechnic and State University defines blight as a characteristic of buildings and private living quarters where structures are vacant, abandoned, or otherwise substandard (Vacant Properties Research Network, 2015, p. 5). Blight is also indicative in public spaces strewn with litter, illegal dumping, and graffiti; it includes vacant lots or "unwanted or highly regulated uses that may have blighting influences, such as adult businesses, junkyards, or heavy industrial uses" (Vacant Properties Research Network, 2015, p. 5). Carpenter et al. (2015, p. 5) define blight as "a local proliferation of vacant, abandoned, and 'problem' properties that may result when a variety and combination of social, economic, and financial conditions are at play." This definition is similar to that used by the City of Atlanta Police Department's Code Enforcement Section, which describes blight as code violations such as decayed or damaged leaking roofs, overgrown, littered vacant lots, graffiti, or dilapidated buildings (Atlanta Police Department, n.d.).

While blight is a public nuisance, and those contributing to blight may be subject to criminal prosecution, blighted conditions are not considered to be a form of criminal violence. Nevertheless, blight is associated with a wide range of compromised social and human health conditions, ranging from mental and emotional stress to increased rates of infectious disease (Garvin et al., 2012; Kondo et al., 2018; South et al., 2015; South et al., 2018). Regarding the latter, Lockaby et al. (2016) found that Atlanta neighborhoods with the highest occurrence of West Nile virus also had the highest frequency of illegal tire dumping, the dumped tires acting as water containers for mosquito breeding. Further, Branas et al.'s study (2016) in Philadelphia, Pennsylvania, found that firearm violence was greater near abandoned buildings that had not received cleaning and vegetation installations, compared to those that had greening installations.

Blight presents most often as copious amounts of trash placed in inappropriate places or as dilapidated structures, but it can also appear as unkempt nature in cities, the result of shifting social structures that diminish the livability of urban spaces. Brownlow (2006), for instance, details the absolute degradation in both social and ecological terms of Cobbs Creek Park in West Philadelphia, Pennsylvania, a transformation that occurred when the formerly all-white Cobbs Creek community transitioned to overwhelmingly African American from the 1950s to the early 1970s. Brownlow (2006, p. 228) and Roberts-Gregory & Hawthorne (2016, p. 19) argue that in such cases a "culture of neglect" emerges when both public and private investment in communities dissipate; significantly, the magnitude and pervasiveness of such disregard erode residents' sense of social control to the extent that public spaces, including and perhaps especially, urban greenspaces, can convert to arenas of fear and chaos (Troy et al., 2012).

In 2014, the City of Atlanta conducted more than 23,000 code enforcement inspections, and roughly 40% of this number was either known or likely blighted vacant properties (Immergluck, 2015, p. 3). Investigations of these properties were estimated to cost from $1.67 to $2.96 million annually. Immergluck (2015) also estimated that a "distressed vacant property" within 500 feet (150 meters) of an occupied, single-family home reduces the value of that single-family home by 3.15%. Such effects are expected to be cumulative up to a certain point.

Miller Runfola and Hankins (2010) mapped blighted or derelict properties in 45 randomly selected census block groups in Atlanta and found that blight conditions were higher in majority African American, south Atlanta communities. Relevant to the present study, they also found that civic engagement, in the form of voting and community organizing, did not lessen blighted conditions. However, Osborne Jelks et al. (2018) contend that in Atlanta, resident-led monitoring and cleanup of neighborhoods is a more effective recourse for blight remediation than generalized civic participation. This kind of civic engagement goes beyond petitioning municipal authorities for redress; rather, it places community activists on the ground, physically

in communities to not only call out blighted conditions but also to inventory and remediate dereliction (Greenberg, 2001; Osborne Jelks, 2008; Osborne Jelks et al., 2018). Of course, residents are limited in the impact they can effect, but this sort of activism places people in out-of-doors spaces where their activities can be witnessed by others.

Along similar lines, we propose that neighborhood-level UFE can also help to minimize blight-contributing behaviors, even those involving derelict properties. If people are purposefully engaged in community spaces—for instance, pruning, planting, holding community meetings, or posting notices about tree care activities— these activities in concert and over time have been shown to deter crime in other settings (Kondo et al., 2016). Related, Fisher et al. (2015, pp. 67–68) argue that long-time urban environmental stewards—that is, those who devote a large portion of their time to local environmental activism—represent a distinct category of civic actors because their engagement extends beyond traditional political participation to include "co-management" and design of urban space (Overdevest et al., 2004). This characterization is similar to Ernstson's (2013) concepts of management capacity and protective capacity, whereby natural areas within cities are established and perpetuated by a linked network of concerned residents, technical and scientific experts, and political allies. Osborne Jelks et al. (2018) describe this process for predominantly African American communities within the Proctor Creek watershed in south and west Atlanta.

South Atlanta tree legacies

UFE presupposes the existence of trees and other vegetation. Some studies have found that lower socioeconomic status and minority communities have less or inadequate access to urban greenspaces compared to others (Flocks et al., 2011; Heynen, 2006; Landry & Chakraborty, 2009; Mills et al., 2016; Pham et al., 2012; Shen et al., 2017). However, this is less the case in Atlanta than in other cities. To better understand contemporary distributions of Atlanta's urban forest, it is helpful to consider sociohistorical processes involving white flight out of the city proper in the 1960s and the 1970s and the consequent occupation of these spaces, first by middle class and then by largely working class and poor African Americans, in the decades that followed (Kruse, 2005; Lands, 2009).

When African Americans ventured out from their cramped, downtown-proximate quarters after World War II and gradually moved closer to, and eventually into, all-white neighborhoods on the city's south side, whites initially mounted strong resistance (Kruse, 2005). Innocuous-sounding neighborhood improvement organizations were formed, like the Southwest Citizens Association and the Mozley Park Homeowners' Protective Association in the late 1940s (Kruse, 2005, pp. 65, 77). These groups were created for the express purpose of legitimizing white supremacist articulations of localized rights, which undergirded efforts to

block black entrance. After these efforts failed to halt black movement into white neighborhoods, white Atlantans abandoned the south and west parts of the city en masse during the 1960s and 1970s, retreating to suburban places that became accessible with improved transportation corridors and automobile usage. By 1980, whites represented just 32.4% of Atlanta's population, a decline of 56.6% from 1970 (Kruse, 2005). Importantly, many of the city's southside, formerly all-white neighborhoods now contain copious amounts of canopy cover, in terms of tree densities on private lots, along streets, and in public parks (Giarrusso & Smith, 2014). Boone et al.'s (2009) examination of the intersection between neighborhood succession and greenspaces in Baltimore, Maryland, and Johnson Gaither's (2014) similar look at Latino migration to Hall County, Georgia, suggest that populations that supplant one racial or ethnic group may inherit, so to speak, the existing green infrastructure (or, conversely, the environmental burdens) left by the exiting group. Although residents in these now "minority-majority" neighborhoods may be the default beneficiaries of urban forest cover established decades ago, it is important to look at people's engagement with this resource and how this interaction may lessen the appearance and production of blight at the household level.

Materials and methods

Household survey administration

We administered a UFE survey door-to-door to a stratified, random sample of the resident population of Atlanta from April 2015 to July 2015, and from May 2016 to August 2016. The survey included a scale to measure UFE, a module with questions related to neighborhood social stressors (e.g., crime, unemployment, public education quality, illegal trash dumping, lack of affordable housing, and the lack of code enforcement—i.e., city enforcement of laws or codes regulating nuisances such as blighted properties or conditions), an inventory of blight on and around the respondent's home, and questions soliciting sociodemographic data about the household. The UFE scale contained statements intended to measure both active management and protection of the urban forest. For instance, "Someone in my household spends a lot of time caring for trees around our home" is an indicator of household-level management of the urban forest; and "People in my household are very interested in increasing the number of trees we have in this neighborhood" is an indicator of urban forest protection. Table 1 contains the complete set of statements administered.

A total of 610 households were contacted and included people living in houses and those in apartment or other non-institutionalized, multi-unit dwellings. Oversampling was done to account for an anticipated non-response rate of roughly 20%. Excluding bad addresses (those with no access, e.g., gated residences,

abandoned or boarded-up homes, no physical address present), the effective sample size was 490 (response rate 80.33%). Of these, 318 observations contained data for variables used in the analyses presented in this paper. However, because of missing data, the effective sample size varied between 251 and 305.

After administering the UFE, social stressor, and sociodemographic modules to respondents, the surveyor went to the end of the respondent's driveway or other appropriate place near the home and inventoried the presence of 11 blight indicators within eyesight of the respondent's home. These were damaged homes or other buildings (which appeared occupied, i.e., those with broken windows, sagging roofs etc.), illegally dumped garbage on streets, discarded tires, discarded furniture (which appeared to be dumped rather than for pick up), junk cars, houses or other building structures that appeared to be abandoned, litter, graffiti, discarded shopping carts, security bars on windows, and damage to concrete from tree roots. The presence (1) or absence (0) of each indicator was recorded.

Logistic model specification

To examine the association between UFE and observed blight, we selected seven of the 11 inventoried indicators, as follows: damaged homes (occupied), illegally dumped garbage, discarded tires, discarded furniture, junk cars, abandoned buildings, and litter. We judged that the first six of these constituted a similar kind of blight or degree of offensiveness. We decided security bars and tree root damage were imprecise blight measures: security bars are more indicative of safety concerns, and tree root damage has more to do with spacing between tree plantings and sidewalks or other pervious surfaces. There was an insufficient number of positive responses to model either shopping carts or graffiti. Litter was the only "less offensive" blight measure that was analyzed. For the seven selected indicators, we specified binary logistic regression models.

In addition to our models for observed blight, we examined resident perceptions of blight by specifying two binary logistic models from the social stressors module of the survey—lack of code enforcement and illegal dumping, which were dependent variables. Residents' indication of whether the stressor impacted their neighborhood (1) or not (0) was recorded.

Explanatory variables were: UFE; whether the household was in a predominantly African American part of the city; homeownership; length of years at residence; and education level. UFE was measured with a five-point Likert scale developed by the authors (Table 1). The scale measures household members' reported interest in and management of, or care for, neighborhood trees. It also measures household members' perceptions of their neighbors' civic and political engagement, as this relates to the protection of neighborhood trees.

An initial set of statements measuring UFE was reviewed in February 2015 by 12 professionals in urban- or environment-related positions, including a college instructor/researcher, environmental justice advisor (US Environmental Protection Agency), epidemiologist (Agency for Toxic Substances and Disease Registry), and environmental consultant. Statements were modified based on input from these professionals. After this, a preliminary survey containing 15 UFE statements was administered from February to May 2015 by Morehouse College students working with the project (n = 100).

A final scale consisting of 14 UFE statements was administered to a stratified, random sample of households (Table 1). We used explanatory factor analysis to examine the underlying scale structure. Analyses were conducted both in SAS 9.4 and in R statistical software. For the SAS analysis, factors were extracted with the principal factor method followed by an oblique rotation. The number of factors retained for rotation was determined by the size of eigenvalues, eigenvalue break points, and factor loadings (Hatcher & Stepanski, 1994). R was used to perform a 10-iteration parallel analysis, which acts as a check on conventional exploratory factor analysis. Parallel analysis addresses traditional eigenvalue cut-off method limitations (e.g., factor overestimation) by averaging n random resampled data sets (derived from the original) and suggesting a lower bound eigenvalue cut-off (Hayton et al., 2004).

A two-factor solution was supported considering both the SAS criteria and parallel analysis. We then reviewed the rotated factor pattern (Table 1) produced by the SAS analysis to identify scale items with a loading of 0.40 or greater for a given factor, and less than 0.40 for the other factor (Hatcher & Stepanski, 1994). In both the SAS and R analyses, Factor 1 loadings were suggestive of urban forest *management*, and Factor 2 loadings indicated urban forest *protection*. Urban forest management has to do with routine activities to establish and care for trees at the household level; protection relates to neighborhood-scale efforts to promote and advocate for the urban forest.

One item with a relatively low loading was omitted from the management factor and two from protection (Distefano et al., 2009). These are indicated in Table 1. Items 5 and 6 for the management factor were reverse coded, and items 1, 2, and 5 for protection were reverse coded. Scale reliability was assessed with Cronbach's alpha for both the 14-item scale (n = 299; α = 0.81) and reduced 11-item scale (n = 305; α = 0.82). See Table 1 for scale items and corresponding factor loadings.

There are several important issues to consider with exploratory factor analyses. First, factor loadings are sensitive to method of extraction, rotation, number of factors interpreted, and sample size (Costello & Osborne, 2005). Following Hatcher (1994) and Fabrigar et al. (1999), we are confident that the extraction, rotation, and number of factors retained are appropriate. The robustness of factor structure

is also important to consider. Costello and Osborne (2005) found fewer errors of inference for the factor structure of scales with larger sample sizes. For scales with a 20:1 item ratio (i.e., sample size to number of scale items), 70% of samples examined had correct factor structure, compared to only 10% with a 2:1 ratio. The ratios for our sample are roughly 21:1 for the 14-item scale and 28:1 for the 11-item scale—well within recommended standards. The combined scales were included as the UFE explanatory variable in the logistic regression.

Table 1. Urban forest engagement: Factor loadings for urban forest management and urban forest protection

Rotated factor pattern (n = 299)		Scale items
Factor 1	Factor 2	
		Urban forest management
.63	−.01	1. Someone in my household spends a lot of time caring for trees around our home.
.73	−.01	2. At least one member of my household feels that it's important to personally care for neighborhood trees.
.58	−.10	3. Participating in environmental cleanup activities in this neighborhood is important to the people who live in my home.
.63	.07	4. People in my household are very interested in increasing the number of trees we have in this neighborhood.
.63	.05	5. No one in my household is interested in personally caring for neighborhood trees. (reverse coded)
.43	.26	6. No one who lives here knows how to get involved with neighborhood improvement groups. (reverse coded)
.27	.25	7. Someone who lives here works with other people to care for trees in this community. (omitted)
		Urban forest protection
.08	.27	1. Most of the people in my neighborhood would not be interested in forming a group to plant more trees in this neighborhood. (omitted)
.08	.50	2. I don't think people in my neighborhood have the political connections to demand that the city plant more trees in this neighborhood. (reverse coded)
.11	.48	3. I see a lot of people caring for trees in this neighborhood.
−.04	.64	4. Residents in my neighborhood work with tree experts to help decide what kinds of street trees the city should plant in this neighborhood.
−.01	.18	5. Most people in my neighborhood focus their organizing efforts on issues that do not relate to tree preservation. (omitted)
−.03	.55	6. The city council representative for this neighborhood is interested in tree preservation.
−.01	.65	7. My community is connected with other communities across the city that are concerned about preserving trees in Atlanta.

Variables

A dummy variable (BLACKATL) was created to indicate if the respondent lived in a predominantly African American area of the city (1) or not (0). Homeownership was also binary and coded 1, renters 0; for education, an associate's degree through graduate-level education was coded 1 and high school or below, 0. Length of residence scores ranged from 1 to 5: 1 = less than one year at residence, 2 = one to five years, 3 = six to 10 years, 4 = 11 to 20 years, and 5 = more than 20 years. Homeownership and length of residence were included to control for people's attachment to their homes and communities.

Urban forest canopy and vegetation characteristics

We also examined the association between tree canopy cover and blight for subareas of the city. These data were not collected as a part of the household survey. Canopy extent was measured by the Georgia Institute of Technology with 2008 Quickbird Satellite imagery (Giarrusso & Smith, 2014). Using this imagery, we calculated canopy cover for five substrata in the city—Northside, Eastside, Southeast, West Central, and Southwest (Figure 1). Again, these estimates were computed to provide a measure of how canopy cover and the seven observed blight indicators varied across areas of the city with differing socioeconomic configurations. The strata were defined by the research team based on our knowledge of racial and socioeconomic demarcations in Atlanta.
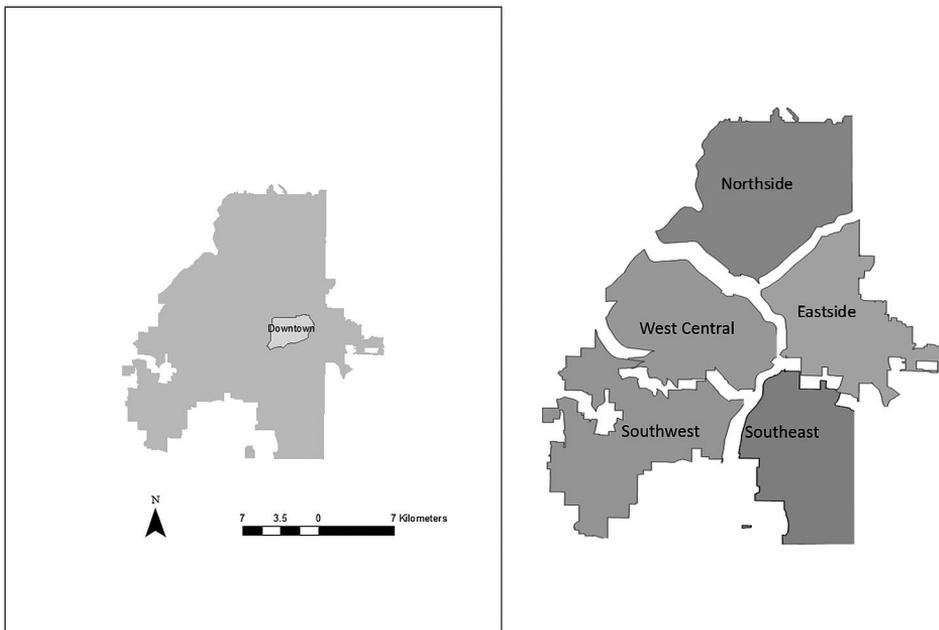

Figure 1. The five substrata of the study area, City of Atlanta

The use of satellite data to estimate canopy cover is an established protocol and has been used to evaluate the spatial distribution of tree canopy in urban landscapes (Landry & Chakraborty, 2009; Locke et al., 2016). For instance, Landry and Chakraborty (2009) used high-resolution imagery to evaluate the spatial distribution of street-tree canopy and social equity in Tampa, Florida. Although there are limitations with using satellite imagery to evaluate canopy cover, such as autocorrelation, these limitations can be addressed through statistical modeling (Locke et al., 2016).

We gathered ground-level vegetation data for a more complete understanding of how tree condition possibly influences blight. If vegetation is relatively low to the ground, dense, and in poor health (dead or dying), this could influence people's perceptions about the overall human attention to an area and possibly increase the likelihood of blight-producing activities or actions on the part of residents, absentee landlords, and others traversing the area. However, we determined that these characteristics were not likely to be perceptible by the untrained eye. As such, these data are not a central part of this analysis but are included in the Appendix for reference (Table A and Figure A).

Results

Socioeconomic composition, canopy cover, and blight by strata

Before discussing household-level regression model results, we present sociodemographic, canopy cover, and blight data for the five substrata of the city (Figure 2). Means for selected sociodemographic variables were computed for census tract groups comprising each of the five strata, using data from the 2009–2014 American Community Survey (Social Explorer, 2017) (Table 2). Northside is predominantly non-Hispanic white and has the lowest mean childhood poverty and vacant housing rate. Eastside is adjacent to downtown and has undergone significant gentrification and white population increase in the past 30 years. The racial mix in Eastside is much more varied than in Northside or the three other substrata, which are predominantly African American. Majority African American areas are differentiated because of the distinct histories and contributions of communities within these areas.

Canopy cover is highest for the most affluent and one of the least affluent strata—Northside and Southwest, respectively (Figure 2). Statistical differences for canopy estimates are not reported because the universe of canopy for the city was provided by satellite, and all differences among strata are substantive. To measure blight at the same scale as canopy cover, we aggregated both our inventoried and social stressor measures of each blight indicator to the substrata scale. Unlike canopy cover, blight distribution follows expected socioeconomic patterns, with more blight in lower-wealth, minority communities—Southwest, West Central, and Southeast.
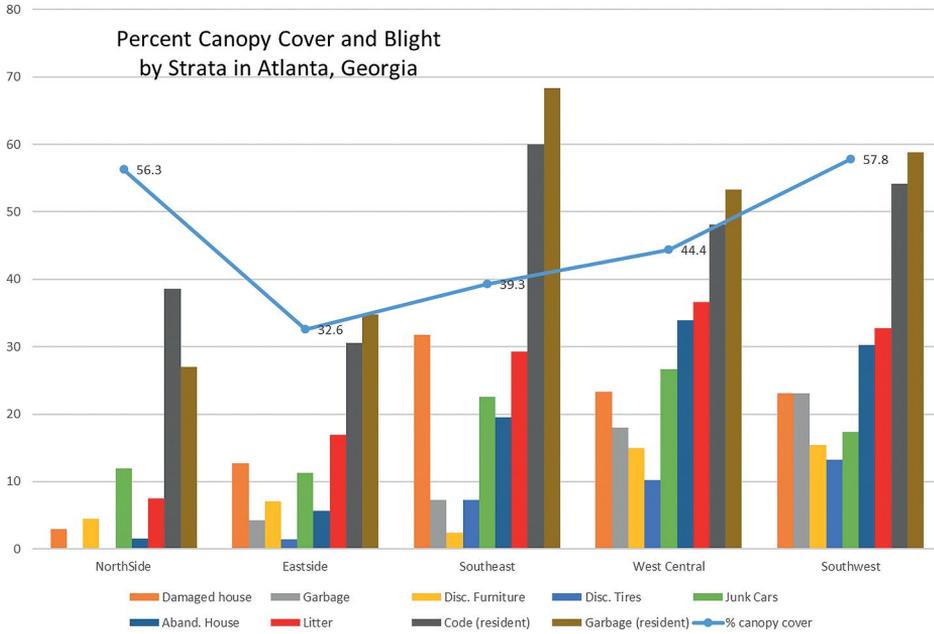
Figure 2. Canopy cover by strata and blight indicator

Table 2. Selected sociodemographic indicators for five substrata,
City of Atlanta

Sociodemographic indicators	Substrata				
	Northside (*n* = 27)	Eastside (*n* = 49)	Southeast (*n* = 27)	West Central (*n* = 25)	Southwest (*n* = 22)
Population	122,328	176,851	87,910	67,171	105,985
Mean population (density/km^2)	1,627	2,543	1,305	1,533	1,184
Child poverty (mean %)	9.36	25.64	48.35	51.19	50.27
White (mean %)	71.99	54.85	12.39	6.76	2.46
Black (mean %)	10.75	32.85	77.57	87.6	91.56
Asian (mean %)	5.61	4.92	1.19	1.12	0.31
Hispanic (mean %)	9.72	4.9	7.2	4.86	4.02
Vacant houses (mean %)	15.86	14.79	28.1	30.4	19.9

Source: Social Explorer (2017).

Table 3. Observed blight indicators: Surveyor-inventoried and resident-identified (chi-square text)

	Surveyor-inventoried							Resident-identified	
	Damaged houses	Dumped garbage	Discarded furniture	Discarded tires	Junk cars	Abandoned structure	Litter	Lack of code enforcement	Dumped garbage
x^2	19.44	24.45	9.45	14.09	7.61	36.85	20.37	10.96	25.53
p value	<0.0006	<0.0001	0.0509	0.0070	0.1071	<0.0001	0.0004	0.0270	<0.0001
n	291	290	291	291	290	291	291	251	251

In Table 3, the chi-square analyses show strong, significant differences across strata for each blight measure, except for junk cars where the significance is marginal. Interestingly, household perceptions of illegally dumped garbage were much higher than inventoried garbage, although the former measure was aimed at perception of the neighborhood rather than the area immediately around the respondent's home. Like the inventoried measures, respondents' perceptions of lack of code enforcement and illegally dumped garbage varied by substrata with a higher percentage of respondents in the predominantly African American areas of the city indicating that both these conditions were problematic.

Logistic model

The probability of a given blight indicator either being in view at the household or being identified by a householder was modeled as a function of UFE, BLACKATL, homeownership, length of residence, and education level. Holding constant other covariates, a significant and negative coefficient on UFE would suggest that people's participation in urban forestry–related activities reduces the incidence of blight around people's homes, regardless of model covariates.

UFE was not significant in any of the inventoried blight models except litter (Table 4). However, BLACKATL was significant for both observed blight (damaged house, dumped garbage, discarded tires, abandoned structures, litter) and for respondent-indicated blight measures (code enforcement violations and illegal dumping), indicating an increased likelihood of one of these blight measures if the household is located in a predominantly African American area of the city. Also, those with higher education were less likely to have damaged houses, discarded furniture, and junk cars near their homes. Those who had resided longer at their residences for a longer time were somewhat less likely to have discarded furniture in view of their homes.

Table 4. Binary logistic regression of surveyor-inventoried and resident-identified blight indicators

	Surveyor-inventoried							Resident-identified	
	Damaged house (n = 281)	Dumped garbage (n = 280)	Discarded furniture (n = 281)	Discarded tires (n = 281)	Junk cars (n = 280)	Abandoned structure (n = 281)	Litter (n = 281)	Code enforcement (n = 244)	Dumped garbage (n = 274)
Intercept	−0.21 NS	−2.96 (0.020)	−0.55 NS	−3.62 (0.030)	−0.39 NS	−1.86 (0.083)	1.83 (0.037)	−0.24 NS	−0.89 NS
Black Atlanta	1.14 (0.002)	2.40 (0.0002)	0.58 NS	3.15 (0.003)	−0.47 NS	2.40 (<0.0001)	1.08 (0.001)	0.61 (0.03)	0.99 (0.0002)
Homeowner	−0.67 (0.087)	−0.60 NS	0.27 NS	0.06 NS	−0.38 NS	−0.12 NS	−0.027 NS	−0.04 NS	0.12 NS
Length of residence	−0.10 NS	−0.05 NS	−0.36 (0.080)	−0.49 (0.046)	0.13 NS	−0.02 NS	−0.16 NS	0.09 NS	0.03 NS
Education	−0.79 (0.028)	0.04 NS	−1.01 (0.0389)	−0.59 NS	−0.73 (0.044)	−0.17 NS	−1.01 (0.003)	−0.05 NS	−0.15 NS
Urban forest engagement	−0.22 NS	−0.11 NS	−0.20 NS	0.12 NS	−0.35 NS	−0.35 NS	−0.72 (0.003)	−0.15 NS	0.05 NS
Model x^2 (likelihood ratio)	39.36 (<0.0001)	29.69 (<0.0001)	13.21 (0.022)	30.44 (<0.0001)	17.64 (0.0034)	45.09 (<0.0001)	53.03 (0.001)	7.81 NS	17.10 (0.0043)
Percent correct predictions	0.75	0.77	0.71	0.82	0.68	0.78	0.78	60.4	63.3
Frequency of 1 response	0.20	0.11	0.10	0.08	0.18	0.17	25.27	0.45	0.46

Note. Number in parenthesis is *p* value.

In terms of substantive impacts, the probability of an African American, living in a predominantly black area of Atlanta, who is a homeowner, lived in the home for six to 10 years, with education beyond high school, and a score of 5 on UFE, having garbage near the home would be 0.14; while the probability of someone living outside of a predominantly black area of Atlanta, with similar characteristics for the other variables, would be 0.06—less than one-half that for a black Atlanta resident. The probability of living near an abandoned structure for someone living in a majority African American community would be 0.17 with the above characteristics held constant; but just 0.02 for someone living in either Northside or Eastside. The blight measures we used are limited in that they indicate only the presence or absence of blight, not the degree of disamenity. Additional study examining the extent of blight and its relationship with the urban forest is warranted.

Discussion and conclusion

This study contributes to the established body of research examining links between urban forests and community integrity. We add to this literature by highlighting the importance of meaning generation when residents manage and advocate for the urban forest. Earlier social theorists worked from the premise that humans act dialectically to both create and receive meaning in a given environment, and that they behave in those environments based on constructed meanings. We argue that if residents actively participate in the establishment and maintenance of, and advocacy for, the urban forest, this is one way that the inhabitants of that place convey to each other and to visitors, interlopers, or others that the place is relevant, consequential, and significant. Both those familiar and unfamiliar with that place respond in a similar, positive manner, for instance by not doing things that contribute to a blighted appearance. Other studies suggest the importance of such signaling, but none are explicit about the role of socially constructed meanings and how engaging with urban vegetation establishes those meanings for residents and non-residents alike.

Our research is also novel in that it examines this association for a city in the US South, which is distinct historically, socioculturally, and climatically from northern and midwestern cities where similar issues have been examined. The consistency of race and place (i.e., BLACKATL) in predicting outcomes for both the inventoried blight and social stressor models indicates that residents in Atlanta's predominantly African American communities are more likely to experience and express concerns about derelict conditions. Results suggest that in these communities, blight and other persistent social stressors minimize the urban forest import. We would argue that blight has a more profound impact on UFE than the other way around. If people must contend daily with blighted conditions near their homes, it is less likely that they would have the time or interest to care and advocate for trees.

Blighted conditions like derelict properties and illegally dumped trash obscure the importance of the urban forest, which may be judged as insignificant in comparison with the volatility and disorder wrought by decaying conditions. However, results indicate that litter, being the least innocuous and most remediable blight indicator, may be reduced by UFE.

Results suggest that litter, being a relatively remediable form of blight, may be reduced by UFE, but that other, more intractable, forms are not affected. Our findings indicate that larger, structural processes are in play that limit what ordinary people can do to combat blight in the form of dilapidated structures, for example. In Atlanta, like some other US cities (Schank, 2019), the municipal government is very careful not to usurp the rights of private property owners when attempting to mitigate blight, even in cases where private property is a public eyesore and presents a human health risk. Atlanta's blight remediation program allows for demolition of blighted properties within 120 business days of reporting, but the process of addressing even a single blighted structure can extend beyond this time frame. The city has first to locate property owners to inform them of a complaint; sometimes these owners want nothing to do with the problem (Lee, 2018). In such cases, a court order is necessary to demolish the property. These circumstances involve extra-local actors and procedures that are not controlled by neighborhood residents. Resident management and protection of the urban forest are comparatively small forces when considered in the context of this intricate bureaucracy.

Urban greening organizations in Atlanta aim to plant, protect, and maintain trees and educate the populace about the relevance of trees to urban ecosystems and human communities in the city. While certainly beneficial, we suggest that such organizations might also use their political and social capitals to help alleviate derelict conditions in the same south Atlanta neighborhoods where they plant trees. In this way, the most immediate conditions and concerns of place are acknowledged before or in concert with green interventions. This way of engaging community is more likely to build trust and respect rather than resistance.

A very good example of this participatory approach is given by the New Haven Urban Resources Initiative, a Yale University–funded program in the US city of New Haven, Connecticut (Murphy-Dunning, 2009). Here, community residents identify areas of their communities that they want to green; they work with the university to design the programs, but the site selection, physical labor, and longer-term vegetation maintenance are performed by residents. This establishes ownership at the start of the program, which increases chances for success. Also important is the fact that residents decide for themselves the relevance and importance of urban greening to their communities.

Our study has implications for the geography of justice literature because efforts to remediate urban blight can have the unintended consequence of stimulating gentrification. In the US, residents of blighted, inner-city communities are lodged in a difficult space. On one hand, persistent blight endangers health and well-being; but on the other hand, when housing shortages in cities like Atlanta push an otherwise reluctant real estate market into areas of the city with extensive blight, this can stimulate house grabbing and remodeling, resulting in dramatically higher housing values and displacement of long-time residents, many of whom are poor and African American. During the last economic downturn, both foreign and domestic real estate speculators purchased hundreds of rundown homes in some historic, west Atlanta neighborhoods where many of the residents are lower wealth and African American. Properties are held in expectation of improvements in real estate markets and infrastructure projects in those parts of the city (Saporta, 2018; Vashi, 2019; Wheatley, 2016). Real estate markets have improved significantly across the US in recent years, including in the City of Atlanta. As well, large, green infrastructure projects are drawing wealthier, white people to south and westside Atlanta neighborhoods (Immergluck & Balan, 2017; Johnson Gaither, 2019). There has been a concomitant criticism of these trends, but some amount gentrification is inevitable and is already evident in west Atlanta. Observers caution that the city's attention to a green sustainability agenda must incorporate a human component that protects the rights of poor people to remain in place. This issue falls within the realm of urban sustainability, a sustainability that involves the necessary intersection of urban ecologies with human systems contending with blight abatement, housing security, and a host of other social justice concerns.

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Appendix

Vegetation data were collected using the i-Tree Eco model protocol (Escobedo & Nowak, 2009). Data from 443 one-tenth acre (0.04 ha), randomly distributed plots were collected and analyzed for a 346.32 km^2 area of Atlanta. Sampling began in September 2013 and ended November 2015. Plots were located on the following land use types: residential, institutional, commercial, transportation corridors, industrial, and vacant areas. Data were collected during tree leaf on season and included land use, ground and tree cover, tree attributes by species, stem diameter, height, crown width, crown canopy missing and dieback, and distance and direction to residential buildings.

Using these data, examination of tree structure revealed significant differences across strata (Table A). Compositionally, the Eastside stratum had the highest number of species (59), and Southeast had the lowest number of species (45). Eastside's high value is attributed to a greater number of samples taken in that strata. To compare species richness across strata, a rarefaction and extrapolation analysis was used, which showed that Northside was the most species-rich and Southwest and West Central were the least species-rich (Figure A). Eastside also had the highest Simpson's reciprocal index, indicating a more even distribution of species.

Table A. Structural characteristics of the urban forest by strata as defined in the text for Atlanta, Georgia

	Northside (*n* = 86)	Eastside (*n* = 119)	Southeast (*n* = 67)	West Central (*n* = 110)	Southwest (*n* = 60)
Area (ha)	9,219.1	5,913.7	5,988.2	6,183.6	7,327.8
Species richness	48	59	45	51	51
Simpson's reciprocal index (percent canopy cover)	17.0	33.6	12.0	14.7	10.1
Mean (standard error) of diameter at breast height (cm)	26.4 (1.1)[b]	29.0 (1.3)[ab]	25.7 (1.2)[b]	32.0 (1.2)[a]	26.9 (0.9)[b]
Density (stems/ha)	78.4 (15.3)[bc]	57.2 (6.2)[c]	113.1 (25.0)[ab]	82.5 (12.5)[bc]	177.7 (32.1)[a]
Basal area (m²/ha)	6.4 (1.1)	6.3 (1.0)	10.1 (1.6)	10.4 (1.3)	15.1 (2.2)[a]
Crown condition (%)	91.6 (1.2)[b]	95.9 (0.8)[a]	93.0 (1.1)[a]	93.4 (1.0)[a]	94.3 (0.8)[a]

[a] Significantly different from "b" and "c" at $p \leq 0.05$ level.

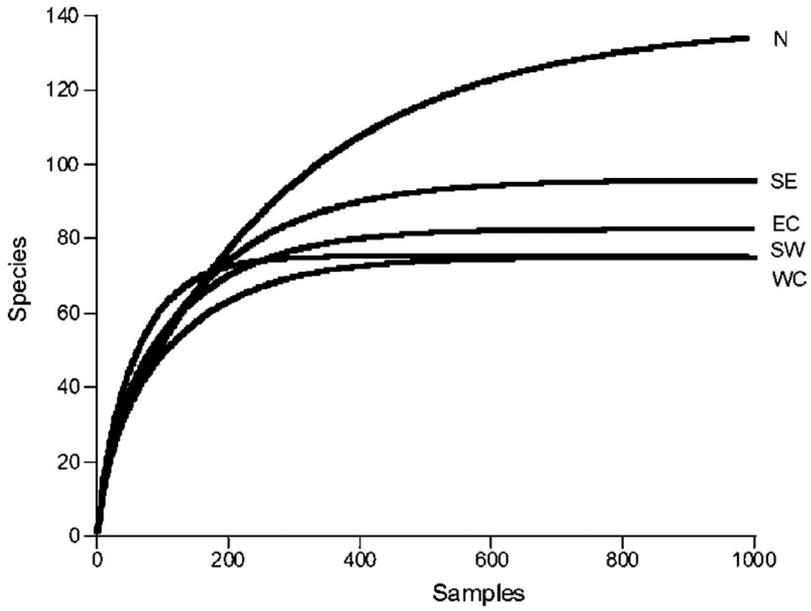[b] Significantly different from "c" at $p \leq 0.05$ level.

Figure A. Rarefaction and extrapolation curves for each strata based on species occurrence and abundance

Key: EC = Eastside, N = Northside, SE = Southeast, SW = Southwest, WC = West Central.