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Smokestacks, Parkland, and Community Composition: Examining Environmental Burdens and Benefits in Hall County, Georgia, USA

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Abstract

This case study addresses environmental equity, in terms of African American, Latino, White, and poor communities' proximity to both industrial facilities and parkland in Hall County, Georgia, USA. The project's two primary goals are to (a) expand environmental justice analyses to account for both environmental burdens (industrial sites) and benefits (parkland acreage), and (b) extend this broader investigation to the county's emergent Latino populations. Results show that both Blacks and Latinos are overrepresented in census block groups (CBGs) within 1 mile of industrial facilities, while Whites are underrepresented. Conversely, Latinos and those near or below poverty are, on average, underrepresented in communities within one-quarter mile of parkland, but Whites are overrepresented. This article discusses the environmental justice and planning implications of these findings in terms of converting existing land uses to urban green space and fuller participation of minorities in such decision making.

Keywords

environmental justice/equity, Latino migration, parkland access

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Introduction

In recent decades, the centuries' long, racial dichotomy in southern U.S. cities and towns has given way to a significant third force—immigration/migration—which has transformed both large and small municipalities into tripartite places struggling to reconcile European, African, and Latin American traditions (Odem, 2008; Winders, 2005; Yarbrough, 2010).[1] "New-destination" cities of the former Confederacy like Atlanta, Georgia; Raleigh, North Carolina; Nashville, Tennessee; and lesser-known places such as Bedford County, Tennessee; and Dalton, and Georgia, are now home to substantial Latino populations (Zúñiga & Hernández-León, 2001).

Within this changing sociocultural context, environmental equity[2] in Hall County, Georgia, is addressed for predominantly African American, Latino, non-Hispanic White (White), and lower income communities.[3] Given the dramatic increases in Latino population across the U.S. South over the past 30 years and lingering disparities between Black and White communities with respect to environmental quality, this article assesses community proximity to both industrial facilities and parkland in Hall County for the racial/ethnic and income groups mentioned above. Typically, case studies examining environmental equity focus on community proximity to either environmental "bads" (e.g., industries, waste facilities) or "goods" (e.g., parkland or green space; Abel, 2008; Boone, Buckley, Grove, & Sister, 2009; Flock, Escobedo, Varela, Wald, & Wade, 2011; Floyd & Johnson, 2002; GreenLaw, 2012; Landry & Chakraborty, 2009; Sadd, Pastor, Morello-Frosch, & Scoggins, 2011; Wolch, Wilson, & Fehrenbach, 2005). Few studies acknowledge the presence of both amenities and "dis-amenities" to move environmental equity scholarship toward a broader interrogation of both the negative and positive aspects of environment (Kruize, 2007; Lakes, Brückner, & Krämer, 2013). With this case study, the concept of "net (environmental) equity" is suggested in an effort to focus the environmental justice gaze on more holistic evaluations of place, specifically on investigations that consider both environmental burdens and indicators of the environmental services provided by urban green spaces such as parks.

Research from a number of disciplines suggests that the environmental services of city trees can offer a wide range of human benefits in physiological, sociological, and psychological terms (Escobedo, Kroeger, & Wagner, 2011; Flock et al., 2011; Kuo, Sullivan, Coley, & Brunson, 1998; McPherson & Simpson, 1999; Nowak & Crane, 1998; Nowak & Dwyer, 2000). For instance, Ulrich (1984) found that post-operative recovery for patients who had a view of vegetation from their hospital rooms was significantly better than that for patients who had views of a brick wall. Branas et al.'s (2011)

study of vacant lots in Philadelphia, Pennsylvania, suggested that the greening of these once-blighted spaces had the effect of reducing gun violence and to a lesser extent vandalism in the city. Kuo et al.'s (1998) study of residents in a Chicago housing project suggested that residents who lived near vegetation experienced less personal stress and that overall crime rates were lower in these sections of the complex than in sections with little or no vegetation. Also, an exploratory study in Wales, UK, reports that green space exposure reduced stress level responses (salivary cortisol) for jobless people (Thompson et al., 2012). U.S. Forest Service scientists also argue that the urban forest (city trees) provides a range of biophysical services, including dry deposition (removal) of specific air pollutants (ozone, sulfur dioxide, nitrogen dioxide, carbon monoxide, particulate matter less than 10 μ), carbon storage and sequestration, and energy conservation (Nowak & Crane, 1998; Nowak, Crane, & Stevens, 2006).

To be clear, net equity should not be taken to mean that vegetation provides a one-to-one balance or offset of environmental risk. Indeed, Nowak et al.'s (2006) simulation of air pollution removal via vegetation in 55 U.S. cities showed that while tree canopy removed greater than 700,000 metric tons of pollutants, pollution mitigation varied depending on percentage tree cover, local meteorology, specific pollutants, and overall pollution concentrations. More importantly, fundamental differences in the types of burdens that may be present in a given place (e.g., emissions, landfill proximity, noise, and olfactory pollution) and the problems of scale and metrics associated with attempting to parry these with indicators of environmental benefits (e.g., increased endorphin production resulting from a walk in the park) prohibit direct aggregation of burdens and benefits. Thus, the aim of this article is not to estimate the relative risk to human well-being by aggregating or subtracting measures of benefits from burdens; rather, the article offers a straightforward estimation of disparate indicators of both environmental burdens and benefits in an effort to look at more than one dimension of environmental equity, simultaneously.

Environmental Justice Framing, Racial/Ethnic Group Concentrations, and Industrial Siting in Hall County, Georgia

The present inquiry was motivated by events that have transpired in the small, mostly Black Newtown community of Gainesville, Georgia (Hall County seat), over the past 30 years. City authorities established homes in "New Town" (later condensed to Newtown) for Gainesville's African American

population in 1937, after a tornado devastated the city in April of 1936 (Roskie, Ferguson, & Yen-Kohl, 2010; Spears, 1998). The siting of polluting industries proximal to the neighborhood since 1950 and the relatively high number of deaths from various forms of cancer and lupus over the years have convinced many Newtown residents that their neighborhood is contaminated with industrial poisons (Roskie et al., 2010; Spears, 1998). In the early 1990s, a Newtown community benevolent organization turned environmental activist group (Newtown Florist Club) began rallying against city zoning authorities to draw attention to community health concerns. A number of health studies have been conducted in Newtown since the 1990s, with mixed results concerning the severity of environmental threats to residents (Agency for Toxic Substances and Disease Registry, 2001, 2002; Kardestuncer & Frumpkin, 1997; McKinley & Williams, 1990).

Environmental inequities in Gainesville and Hall County have been framed largely in terms of conflict between Newtown residents and White authorities representing industry and the local municipal government. Predominantly Black neighborhoods adjacent to Newtown have been conspicuously absent from these contestations although industries are prevalent throughout Gainesville's south side, where Black neighborhoods are concentrated. As well, very large increases in both the city and county's Latino population over the past 30 years compel a more careful examination of which racial/ethnic groups are more likely to be exposed to both environmental harms and potential amenities (U.S. Census Bureau, 2012a, 2012b).[4]

Hernández-León and Zúñiga (2000) trace the beginnings of significant Latino migration and immigration to Georgia and elsewhere in the South to the 1986 Immigration Reform and Control Act, which allowed Latin American immigrants to move more freely within the United States. Important for this discussion is that the first waves of migrating/immigrating Latinos to Hall County located in south-central Gainesville neighborhoods not far from Newtown that, historically, were predominantly White working class and poorer sections of the city.

An analysis of 1990 and 2000 census data shows that considerable numbers of Whites left these communities with the entrance of large numbers of Latinos in the 1990s and 2000s. For instance, in 1990, the earliest year for which comparable census track delineations are available, percentage Latino was only 9% for U.S. Census Tract 10, a tract that had 44% and 30% Latinos by 2000 (the tract was split into two tracks in 2000). Percent White in this tract was 84% in 1990. Percentage Latino more than doubled in a neighboring tract (11) during this same period, increasing from 31% to 69% (U.S. Census Bureau, 1992; U.S. Census Bureau, 2002).

While Latino-dominant neighborhoods are not burdened with the same level of industrial density as Newtown, they are nevertheless situated near

industries located elsewhere in south Gainesville. Importantly, if moderate and lower income Whites occupied these same neighborhoods in decades prior to the 1990s and if industry was also located there when the neighborhoods were majority White, then the historical injustice, in terms of industry siting in Hall County, may relate as much to income as race and ethnicity.

As with other environmental justice case studies, important here is also the "which came first" question of whether industry or marginal groups (i.e., White working class/poor or racial/ethnic minorities) were the *first* to occupy areas of the county that now have nearby industry (Been & Gupta, 1997; Pastor, Sadd, & Hipp, 2001). Been and Gupta (1997) argue that an environmental injustice is less likely to exist if marginal populations choose to locate near environmental risk. Newtown existed prior to the advent of industrial encroachment in the 1950s (Spears, 1998). This a priori settlement suggests that neighborhood composition (i.e., poor and working-class Black residents) may have been a draw for industrial siting in this predominantly African American community. The present analysis did not identify the years industries located elsewhere in Gainesville or Hall County or when adjacent neighborhoods were established although a visual inspection of industrial buildings and homes suggests they have both existed for several decades.

A crucial factor influencing industrial siting decisions in the county is industry's obvious desire to locate proximal to a major rail corridor that traverses the county. The railroad line figures prominently in Newtown's built structure. Please refer to Figure 1 of Online Appendix A. As can be seen, industrial location hugs the rail line not only in Newtown but also throughout the county. Figure 2 of Online Appendix A shows that the majority of residents in these rural communities are White. Newtown stands out an exception to other Gainesville communities because of the very high density of industries proximal to it. However, as Figures 1 and 2 of Online Appendix A indicate and this article argues, industrial siting is not constricted to Newtown; hence, analyses of environmental justice in Hall County should move beyond a singular focus on the Newtown community.

Parkland Access as Environmental Equity

Increasingly, researchers argue that green space access represents an environmental justice issue because of correlations between poor and/or minority neighborhoods and lack of access to publicly funded urban parks and trees (Landry & Chakraborty, 2009; Taylor, Floyd, Whitt-Glover, & Brooks, 2007). Sister, Wilson, and Wolch (2008) noted significant differences in walking access to parks for majority Latino, African American, White, and Asian neighborhoods across southern California. Also, Heynen, Perkins, and Roy

(2006) found that urban tree canopy in Milwaukee, Wisconsin, was located disproportionately more in White, upper income districts. In particular, Latino residency was negatively correlated with amount of both public and residential tree canopy. Furthermore, a nationwide examination of 409 communities showed higher income communities had more physical activity settings, and those with higher percentages of Black households had fewer parks and green spaces (Powell, Slater, & Chaloupka, 2004).

Boone et al. (2009) examined the distribution of urban parks in Baltimore, Maryland, and found that, while a higher number of African Americans, compared with Whites, were within walking distance of city parks, parks in majority African American districts had higher park congestion. Similar to the Baltimore study, Sister, Wilson, and Wolch (2007) found that Whites were more likely to live in Park Service Areas with larger open spaces and lower residential densities, compared with Latinos or African Americans.

The foregoing discussions of industrial siting and park access highlight the importance of examining Latino migration to the South in terms of the environmental context of destination sites. This study of environmental justice examines that context by looking at potential burdens and amenities settlers may encounter. Latino exposure to industrial facilities and parkland is considered relative to the exposure of established African American and Whites in Hall County, Georgia. This investigation enhances the environmental justice literature by (a) simultaneously considering proximity to environmental burdens and urban green space as factors contributing to environmental justness, and (b) examining such exposure for both migrants/immigrants and for racial groups with a long history in the South.

Method

Building on the aforementioned discussion, this project looks at the distribution of Hall County industries to determine (a) mean percentage of African American, Latino, White, and persons near or below poverty level living within 1 mile (1.6 km) of manufacturing or processing industries; (b) mean percentage of African American, Latino, White, and persons near or below poverty level living within one-quarter mile (0.4 km) of county parkland; and (c) number of industries and amount of parkland per 1,000 capita and per square mile for majority White and Latino neighborhoods and those with a significant Black presence.

Similar to Abel (2008), this study also examines proximity to type of industry. It explores the comparative risk to African Americans, Latinos, Whites, and those near or below poverty living within 1 mile of the U.S. Environmental Protection Agency-listed (EPA) Toxics Release Inventory (TRI) facilities in the county and carcinogen-processing facilities.

Abel (2008) argues that more effective environmental justice analyses, from a managerial perspective, should move beyond assessments of minority proximity to environmental hazards to include analyses of the relative risk posed by such facilities. TRI data are reported for industries that manufacture or process in excess of 25,000 pounds or use more than 10,000 pounds of an identified toxic chemical annually (U.S. Environmental Protection Agency, 2002). Abel (2008) notes limitations of TRI data, including the fact that they are self-reported by industry, which may underestimate amounts actually released; also, the data are not monitored but are estimates of amounts released.

Identification of Hall County Industry and Parkland

The environmental firm GreenLaw conducted an inventory and mapping of Hall County industries in 2008/2009 (http://green-law.org/).[5] Sources of this inventory were the EPA's TRI listings (http://www.epa.gov/TRI/), Envirofacts Data Warehouse (http://www.epa.gov/enviro/), and Surf Your Watershed (http://cfpub.epa.gov/surf/locate/index.cfm). This inventory identified 120 industrial sites.

In the fall of 2009, the accuracy of the GreenLaw listing was verified by examining Google Earth photography of the county and ground truthing the listings. The ground truth exercise included driving to industry addresses and visually inspecting the site to determine whether an industry actually existed at a given address.[6] If the business was closed or it appeared as if there were no current activities at the site, the industry was omitted. Also stricken from the list were commercial or sales offices, schools, and convenience/gasoline stores. The final list contained 101 industries. Industries are defined as those that produce, process, or transport raw or recycled materials or manufactured goods. The distribution of these industries is mapped in Figures 1 and 2 of Online Appendix A.

Parkland data were obtained from two sources. State park location and size (Tiger files) are from the Georgia Geographic Information System (GIS) Clearinghouse (http://data.georgiaspatial.org/). Data for other Hall County park boundaries are from the Hall County Planning Office (www.hallcounty.org/devserv/planning_zoning.asp). There are 74 parks in Hall County. Of these, 29 are U.S. Army Corps of Engineers facilities located near the county's Lake Lanier district; 21 are city parks (including Gainesville, city of Clermont and Flowery Branch); 18 are administered by Hall County; 2 are privately owned; 2 are are Georgia State Parks; and 2 are a combined Gainesville/Hall County park. The total parkland is 8,069 acres.

The radius method of assessing community proximity to both industry and parkland was used (Abel, 2008; Wolch et al., 2005). GIS mapping (*ArcMap*) was used to draw either 1-mile buffers around each industry or one-quarter mile buffers around each park. The resulting industry or parkland buffer

consisted of acreage containing populations from at least one census block group (CBG) in the county. CBGs are U.S. census-designated groupings comprised of several city or municipal blocks (streets). If an industry or park were in a larger, more remote part of the county, it was less likely to include multiple CBGs. Facilities or parks located closer to the urban core typically contained more than one block group.

Black, White, Latino, and poverty populations were estimated for each buffer based on the ratio of CBG acres captured by a buffer to that CBG's total acreage. That ratio was then multiplied by the number of a given race/ethnic group in that same CBG to estimate the population for that race/ethnic group. Thus, each industry or parkland buffer is a unique combination of populations contributed by the CBGs of which the buffers are constituted. For example, the industry buffer encompassing Cargill, Incorporated consists of eight unique pieces of acreage covering eight CBGs. To estimate the number of Latinos contributed by a given CBG to a buffer, the ratio of the acreage contributed to the buffer by CBG "A" to the total acreage for the contributing block group was determined; this ratio was then multiplied by the number of Latinos in CBG "A" to estimate the number of Latinos from this block group. The total Latino estimate for the Cargill buffer was derived by similarly estimating the number of Latinos from each piece of the buffer (all CBGs contributing to the buffer) and then summing these. The same procedure was used to calculate the number of African Americans, Whites, and poor residents within each buffer.

A resident could potentially be included in more than buffer, depending on the proximity of industries or parks to one another. To avoid over-counting residents in any given buffer, the mean percentage of Blacks, Latinos, Whites, and households near or below poverty is reported for industry and parkland buffers, respectively. "Poverty" is indicated by the ratio of household income to poverty level. These data are from the American Community Survey conducted from 2006 to 2010. Households included in this survey are those where the poverty ratio (household income divided by poverty level) for 1 year ranged from 0.50 to 1.24 the poverty rate. A more malleable definition of poverty than the standard "below poverty" descriptor was selected because those whose income is just above poverty encounter social conditions similar to those who are officially at or below poverty (U.S. Census Bureau, 2011).

Results

Industry Buffers

Table 1 shows mean percentage African American, Latino, White, and poverty for all 101 industry buffers. African Americans account for about 7% of

Table 1. Mean Percentage Racial, Ethnic, and Income Group Living Within 1 Mile of All Hall County Industries, Toxics Release Industries, and Carcinogen-Processing Industries.

	All industries	TRI industries	Carcinogen-processing industries
African American	9.84	12.78	11.97
Latino	47.37	42.20	36.22
Non-Hispanic, White	56.31	57.15	62.37
Near or below poverty	28.97	27.86	26.54

Note. TRI = Toxics Release Inventory.

the county population, Latinos about 26%, Whites roughly 64%, and people below poverty about 17%. Results show African Americans comprise an average of about 10% of residents within 1 mile of any type of industry, Latinos 47%, Whites 56%, and persons near or below poverty, 29%. The data indicate that Blacks, Latinos, and the poor[7] are overrepresented in the population near industries, and Whites are underrepresented.[8]

For TRI industries, mean percentage Black near facilities processing EPA-specified toxins is roughly 13 and mean percentage Latinos is 42 (Table 1). Although Whites again make up the majority of the population near these industries (57%), they are underrepresented vis-à-vis their presence in the larger population. Both Blacks and Latinos are overrepresented. The mean percentage of those near or below poverty in proximity to industries is about 28. Table 1 also shows that on average, Blacks make up about 12% of the population within 1 mile of facilities that handle cancer-causing materials; Latinos, 36%; and Whites comprise about 62% of the population near carcinogen facilities. The average percentage near or below poverty within 1 mile of these facilities is about 27. There is a higher average percentage of Blacks in both TRI and carcinogen buffers (roughly 13% and 12%, respectively), compared with industry buffers generally. Blacks are again overrepresented near these industries relative to their numbers in the general population.

Industry Clustering by Block Group

The 1-mile radii with industry as the focal point capture multiple CBGs or neighborhoods affected by a given industrial location. An alternative method of evaluating community proximity to industry was done by taking the neighborhood as the unit of analysis rather than the industrial site. The focus here is on assessing industrial presence in neighborhoods with a predominant racial, ethnic, or income group composition.

Table 2 (column 1) shows total number of industries, TRI, and carcinogen-processing industries for an amalgam of adjacent block groups with a majority of either Whites, Latinos, African Americans, or poor residents. Four heavily African American block groups were identified[9]; 13 were majority Latino, and 68 were majority White. The second column in Table 2 shows the number of industries for each industry class. Industries per 1,000 capita and per square mile are also presented for each type of industry in columns 5 and 6, respectively. The number of total industries per 1,000 persons in the Latino block groups was highest at 1.02, followed by the Black areas (0.86), and the 68 mostly White neighborhoods (0.45). The Latino and Black neighborhoods also had the highest number of total industries per square mile, 0.97 and 0.94, respectively. Industrial presence in White communities was far less likely at 0.45 for total number per 1,000 persons and 0.16 per square mile. In neighborhoods where more than half the households were poor, there were 0.28 industries per 1,000 persons and 0.70 per square mile.

Heavily African American neighborhoods also contained the highest TRI facilities per 1,000 persons (0.58) and per square mile (0.63). Per person and square mile concentrations were substantially lower for Latino (0.17 and 0.17), White (0.10 and 0.04), and poor neighborhoods (0.09 and 0.23). Carcinogen-emitting facilities were also highest per capita and per square mile in heavily Black neighborhoods (0.29 and 0.31, respectively), followed by Latino CBGs (0.06 and 0.06) and White neighborhoods (0.06 and 0.02). Calculations for the county are provided for comparison.

It is notable that for White communities, the ratio of total industries to population was nearly 3 times higher than the ratio of total industries to square mile, while for Black and Latino CBGs, these ratios were much closer. The greater dispersion of the White population across the county likely contributes to this difference. For African Americans and Latinos, the bulk of both their populations and industry exist closer together, whereas White communities are more dispersed across the Hall County. As indicated, industry is located primarily along the rail corridor that traverses both rural and urban parts of the county. Some majority White communities are co-located here, but there are also majority White communities in other parts of the countryside with no industrial presence. Again, this is less the case for Latinos and African Americans who are more likely to be exclusively in urban areas that contain industrial sites.

Parkland Access by Race, Ethnicity, and Poverty Status

To examine social group proximity to parkland amenities, a similar analysis of the demographic composition of buffers was conducted for county

Table 2. Number of All Industries, TRI Industries, and Carcinogen Industries per 1,000 Persons and per Square Mile in Majority African American, Latino, and White Census Block Groups in Hall County, Georgia.

	N	Total population for affected CBGs	Square miles for selected CBGs	Industries/ 1k population	Industries/ sq. mile	TRI industries/1k population	TRI industries/ sq. mile	Carcinogen industries/1k population	Carcinogen industries/sq. mile
Black CBGs									
Industries	6	6,950	6.35	0.86	0.94	0.58	0.63	0.29	0.31
TRI industries	4								
Carcinogen	2								
Latino CBGs									
Industries	35	34,184	36.06	1.02	0.97	0.17	0.17	0.06	0.06
TRI industries	6								
Carcinogen	2								
White									
Industries	58	128,977	366.00	0.45	0.16	0.10	0.04	0.06	0.02
TRI industries	13								
Carcinogen	8								
>50% households near/below poverty									
Industries	3	6,505	4.27	0.28	0.70	0.09	0.23	0	0
TRI industries	1								
Carcinogen	0								
Hall County									
Industries	101	179,684	392.78	0.56	0.26	0.13	0.06	0.07	0.03
TRI industries	23								
Carcinogen	12								

Note. TRI = Toxics Release Inventory; CBGs = census block groups.

Table 3. Mean Percentage Racial, Ethnic, and Income Group Living Within 1/4 Mile of Hall County Parkland.

	Parkland
African American	7.19
Latino	18.59
Non-Hispanic, White	78.63
Near or below poverty	21.22

parkland. Table 3 displays mean percentage race/ethnicity and poverty for buffers within one-quarter mile (or walking distance) of each park. On average, more Whites compared with Latinos or African Americans lived within a short walking distance of a park. The average percentage Black within one-quarter mile of all buffers was 7%, 19% for Latinos, and roughly 79% for Whites. The mean percentage at or below poverty was 21%.

When the race/ethnic and poverty percentages are looked at in relation to their corresponding numbers in the county, these proportions show that a relatively lower proportion of Hall County Latinos, compared with Blacks or Whites, can easily walk to parks (18.59/26.1). Figure 2 of Online Appendix A shows a large park next to majority Latino neighborhoods. This is the 2,408 acre Chicopee Woods nature preserve, which is actually located in both majority White and Latino neighborhoods. Railroad tracks and a state highway inhibit walking access for residents in nearby communities, however. The ratio of mean Black percentage across buffers to the Black percentage in the county is about one; but Whites are, on average, overrepresented in neighborhoods within walking distance of parks (78.69/63.6).[10]

To address parkland clustering by neighborhood, parkland per 1,000 persons and per square mile were compared for CBGs that contained a predominant racial or ethnic group (Table 4). Less than one half an acre of parkland (0.39) per 1,000 persons is available for residents in the four block groups with higher African American populations (Table 4). Roughly 10 acres per 1,000 residents are available in majority Latino CBGs, and there are about 59 acres for every 1,000 persons in majority White block groups.

Acreage in CBGs with a higher Black presence is well below the recommended amounts by the National Recreation and Park Association (NRPA; 6.25 to 10.5 per 1,000 residents; Mertes & Hall, 1996). The amount in majority Latino CBGs is within the upper bound of recommended acreage by the NRPA; however, this amount is far below the typical acreage available in Hall County neighborhoods with high White concentrations. It also falls short of the amount in neighborhoods where the majority of residents are near

Table 4. Parkland Acreage per 1,000 Persons and per Square Mile in Majority African American, Latino, and White Census Block Groups in Hall County, Georgia.

	Population	Square miles	Parkland acreage	Parkland/1k population	Parkland/sq. mile
Black CBGs	6,950	6.35	2.68	0.39	0.42
Latino CBGs	34,184	36.06	328.22	9.60	9.10
White CBGs	128,977	366.00	7,558.07	58.60	20.65
>50% below/near poverty	6,505	4.27	181.04	27.83	42.40
Hall County	179,684	392.78	8,069.28	44.91	20.54

Note. CBGs = census block groups.

or below poverty. As well, Black and Latino neighborhoods had lower parkland per square mile, vis-à-vis non-Hispanic White communities. For the county as a whole, 44.91 acres were available per 1,000 residents, which far exceeds the NRPA's recommendation. Here too, per capita acreage exceeded square mile acreage by about three to one, owing again to the higher concentrations of Black and Latino populations in neighborhoods also containing parkland.

Discussion

Issues of environmental justice in Hall County have been raised for the Newtown community, with good reason; however, the county's burgeoning Latino communities are also confronted with environmental degradation. White departure from central city areas in the 1990s coincided with Latino settlement in these neighborhoods. Latinos, in some sense then, inherited "riskscapes" characterized by comparatively higher industrial concentration, which may have existed to some extent when the neighborhoods were predominantly White, working class/poor. However, results suggest that predominantly Latino communities do have access to sufficient amounts of county parkland although the ratio of mean percentage Latinos within one-quarter mile of a park to percentage Latino in the county is only about 0.71. The data indicate that Latinos are underrepresented in neighborhoods within walking distance of parks, but when parks are near Latino communities, these amenities are appropriately sized.

Results suggest that Hall County African Americans are more likely than both Whites and Latinos to live near industry and have far less than the

recommended amounts of parkland acreage proximal to communities with substantial Black populations. Unlike Latinos, Blacks are not underrepresented in areas near parks; however, the parkland in African American communities is far less than that available in mostly Latino or White neighborhoods.

Thus, with respect to the question of net equity guiding this study, results clearly indicate greater environmental risk for African Americans and to some extent Latino populations, vis-à-vis Whites. Both minority groups are overrepresented near industry and have a larger number of industries in their communities for virtually all industry classes. Similar to Latinos, the benefits of parkland amenities for Black communities is somewhat more complicated given that the mean percentage Black living near parks is about the same percentage as Blacks in the larger population, but again, park allocations in areas with higher numbers of Blacks is woefully small compared with acreage in areas near Whites. Also, like Boone et al.'s (2009) study of Black access to Baltimore city parks, this study also shows that while Blacks may have sufficient access, that access is circumscribed by smaller resource allocations.

It is not likely that the redress of environmental risks to Hall County's Black and Latino communities will be addressed by the relocation of private industry, given the intricacies and costs associated with industrial relocation and the legalities of rezoning, among other factors. However, the public provision or expansion of green space may represent a viable option for city and county park managers. For example, the "Red Fields to Green Fields" effort spearheaded by the Georgia Institute of Technology in Atlanta, Georgia, outlines steps that local municipalities could take to redevelop abandoned commercial properties into local green space (http://rftgf.org/joomla/). Local governments would purchase financially insolvent properties (in the "red"), then convert the land to public parks. Indebted properties may also be acquired under the rubric of land trusts, which offer more flexible options for mixed land uses such as those including parks and open space. The Newtown Florist Club, in fact, has a land trust focusing primarily on the provision of real properties for low- and moderate-income homebuyers.

Importantly, from a larger environmental justice perspective, these efforts would involve affected communities in decisions about both the selection and design of green space in their communities. While the locating of more green space in minority communities would improve the environmental "justness" of place by addressing the "distributive" dimension of environmental justice, a more complete implementation of environmental justice includes "procedural justice," which is the active and meaningful participation of minorities and lower income groups in decision making about the distribution of both

burdens and amenities. One strategy that might be adopted in Hall County to fortify such an effort would involve coalition building among African American and Latino communities around environmental quality. "Black/brown" alliances in the South have formed around workers' rights although in some cases these pacts are rife with tension due to racism/xenophobia and generalized resentments on the part of both Blacks and Latinos (Mathews, 2009). In Gainesville, the Newtown Florist Club and *El Puente*, a local Latino rights organization, have coalesced to improve racial justice in the city by administering a health survey, jointly conducting a Peace March aimed at reducing school violence, and petitioning local police to limit racial profiling (Southern Regional Council, n.d.). This author is not aware of any other collaboration in Hall County between Latinos and Blacks involving environmental issues although Faye Bush, head of the Newtown Florist Club, is quoted as saying, "They [Latinos] are exposed to the same kinds of things [in the environment] because they live in the same area [as African Americans]" (Southern Regional Council, n.d., p.7).

Methodologically, this study has the advantage of using population rather than sample data. As such, the computed ratios provide the real or substantive differences between the communities for the chosen indicators. Metrics used in this article to indicate net equity—mean percentage of each race/ethnic and income group proximal to total industries, TRI industries, and parks and the ratios of industry population and square miles for total and TRI industries—represent a very straightforward way of assessing environmental equity in terms of burdens and amenities and could be useful in subsequent analyses.[11] In future applications, however, census populations used to apportion the various racial/ethnic groups into buffers should be adjusted using some type of algorithm that takes into account ground-level factors such as land cover, roads, slope, and nighttime lights (Oak Ridge National Laboratory, 2008). These methods would allow for a redistribution of populations based on physical features of place, rather than assume populations are evenly distributed across a given area.

This investigation broadens environmental justice analyses by considering net equity or community nearness to both industries and parkland. It does so within the context of a culturally transforming place. The study represents the first known effort to document environmental constraints faced by Latino settlers in the region. As such, it provides a baseline against which future investigations can be compared.

Future assessments focused on more holistic assessments of environmental quality would be enhanced with the inclusion of multiple burdens and benefits. For instance, following Sadd et al. (2011), greater attention to the cumulative impact of disparate burdens such as proximity to hazardous land

uses and sites, exposure to ambient toxins, and social vulnerabilities associated with sociodemographic variables may be included. Also, this work should include indicators of human agency in the form of people's engagement both with efforts to resist environmental threats and their activism to articulate the benefits of environmental amenities, including urban waters (Ernstson, 2013). Importantly, culturally specific preferences for environmental amenities should be identified and consideration of both the benefits and costs of such amenities included in assessments of environmental justice.

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Notes

1. Asian-origin populations have also increased substantially in recent decades, but the Latino increase has been greater.
2. Environmental justice and equity are used interchangeably in this article.
3. African American and Black are used interchangeably. Latino and Hispanic are used interchangeably.
4. The county's Latino population increased fourfold between 1990 and 2000. In 2010, Latinos were 26.1% of the county population and 41.6% of Gainesville's population. The county's non-Hispanic White population was 63.6% in 2010, and the non-Hispanic black population was 7.4%.
5. The unpublished listings may be obtained by contacting the author.
6. UrbanForestry South assisted with ground truthing industry locations
7. The census data are not comparable with the poverty estimate used in this analysis, as some of those above poverty were included in the measure used in this article.
8. Although population data are used in the analysis, statistical estimates of Black, Latino, and non-Hispanic White proximity to industries was done to provide an indication of the magnitude of difference among these groups. A single-factor analysis of variance (ANOVA) was conducted on the distribution of the ratio of racial/ethnic group proportion near all industries to the proportion of that racial/ethnic group in the county. For instance, in a given buffer, if the proportion of Latinos was 0.19, then the "Latino ratio" in that buffer was calculated by dividing 0.19 by 0.261 (Latinos represent 26.1% of Hall County's population). This ratio provides an indication of the over- or underrepresentation of racial and

ethnic groups in the 1-mile buffer surrounding each Hall County industrial site. Three ratio distributions were examined for representation of Blacks, Latinos, and non-Hispanic Whites. The ANOVA showed a highly significant difference by race/ethnicity, $F = 39.69$ (2, 303); $p = .0000$ ($N = 101$).

9. Because Blacks are not a majority in any CBG, I chose four CBGs with the highest percentage Black to represent a "Black presence" (i.e., CBGs where Black population ranged from 39% to 42%).
10. Again, a single-factor ANOVA evaluated the distribution of the ratio of racial/ethnic group proportion near parkland to the proportion of that racial/ethnic group in the county. This was done for Black, Latino, and non-Hispanic White distributions. Results indicated a significant difference by race/ethnicity, $F = 8.759$; $p = .0002$.
11. Carcinogen industries could be combined with Toxics Release Inventory (TRI) industries.

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