

Eco-Apartheid: Linking Environmental Health to Educational Outcomes

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Background/Context: *The issue of how to achieve a racially diverse student population has become increasingly challenging since a 2007 U.S. Supreme Court split decision endorsed the importance of creating diverse schools, while simultaneously limiting the assignment to public schools based on an individual student's race or ethnicity. The article examines innovative efforts at achieving racial integration in Berkeley, California, as well as other district efforts in New York City, to curtail the dangers associated with polychlorinated biphenyls (PCBs) in school building materials and develop plans to remediate contaminated school buildings.*

Purpose/Objective/Research Question/Focus of Study: *In this article, the author draws on the disciplines of environmental sociology, critical race theory, and social epidemiology to examine the relationship between school desegregation, environmental inequality, structural racialization, and health and educational outcomes. The author proposes a conceptual framework for linking environmental health to educational outcomes that considers the dynamic social processes through which social and environmental inequalities—and associated health and educational disparities—are produced, reproduced, and transformed.*

Setting: *Berkeley Unified School District has achieved substantial integration in a city where neighborhoods are polarized by racial-ethnic, socioeconomic status, and environmental inequality. Moreover, the Berkeley integration plan was upheld in 2009 by the state appellate court, a decision that the California Supreme Court allowed to stand. As a result, the Berkeley Unified School District's plan to maintain diversity could serve as a national model for other public schools that are seeking constitutionally sound desegregation programs.*

Research Design: *Using empirical evidence from the published literature, as well as the author's own practical experience conducting community-based participatory research in Berkeley, the author applies the eco-apartheid conceptual framework to the city of Berkeley.*

Conclusions/Recommendations: *The eco-apartheid framework provides a useful model for theory building in the study of environmental health and educational equity. Moreover, the*

author recommends that theories of racial and educational inequality in general would benefit from a more serious consideration of the role that environmental inequalities play in structuring the relationship between health and educational inequality. Additionally, the author highlights the ways in which existing research on desegregation remains in need of theoretical strength and methodological rigor with respect to environmental inequality.

The proximate goal of this article is to contribute to the reconceptualization of environmental racism in the school desegregation literature, with a particular focus on social determinants of health, critical race theory, and social epidemiology. The more ambitious long-term goal is to open the door for broader environmental health issues to be considered as harms of segregation or potential benefits of desegregation. Long before the *Brown* decision, race was, and remains, a powerful organizing feature of American social life. All across the United States, racial ideologies operate politically, legally, and socially to limit Black people/people of color access to economic, educational, and environmental resources (Bonilla-Silva, 2001; Bullard, 1990; Corburn, 2005; Freudenburg, 2005; Pulido, 2000). As a social construct, the concept of race is veiled within a larger “meritocratic” discourse that is based on the narrative of the American Dream—a popular Hollywood trope that signifies that individuals do not inherit their social status, but attain it on their own ambition and ability. Stories of spectacular mobility ranging from Horatio Alger’s to the movie *The Pursuit of Happyness* (Black & Muccino, 2006) resonate in the American psyche and hold a treasured place in our national folklore (MacLeod, 1987/1995). However, these rags-to-riches stories—which often highlight the exception rather than the norm—are often produced and reproduced without detailed attention to the present effects of past discrimination, or more specifically, without a discussion of the complex interplay between environmental racism and educational equity, health inequality, and educational outcomes (Akom, 2008; Darden, 1986; Farley, Steeh, Krysan, Jackson, & Reeves, 1994; Krieger, 1999; Massey & Denton, 1993; Morello-Frosch, Pastor, & Sadd, 2002; Williams, 1996, 1999).

In this article, I suggest that efforts to eliminate well-established racial disparities must consider the historical relationships between eco-apartheid—which I define as the interinstitutional arrangements and interactions that produce unequal environmental benefits and burdens based on race, class, gender, language, and immigration status, as well as their interconnections—and health and educational outcomes. I present evidence that outlines how eco-apartheid is an important cause of racial disparities in health and education, one that (1) influences access to

institutional resources and privileges that promote health, and (2) influences educational outcomes (Link & Phelan, 1995; Williams & Collins, 2001). My conceptual framework draws from environmental sociology, public health, urban education, and social epidemiology to examine the relationship between school desegregation, environmental inequality, structural racialization, and health and educational outcomes.

Drawing from previously published literature, I demonstrate how *eco-apartheid* is a key determinant of health disparities and has led to the disproportionate exposure of Black people/people of color to the effects of concentrated poverty. For example, between 1950 and the present, the political, social, and economic conditions of many metropolitan areas helped cluster African Americans into older urban areas with high concentrations of poverty and environmental pollution (Jargowsky, 1997). More recently, there has been an out-migration of African Americans to suburban areas, yet place-based racial discrimination applied to where African Americans live remains one of the most significant bases for persistent racial inequality—even when controlling for socioeconomic status (Brulle & Pellow, 2006). Residence in areas characterized by high concentrations of African Americans has been connected with higher rates of all-causes mortality (Anderson, Dorlie, Backlund, Johnson, & Kaplan 1997; Collins & Williams 1999; Geronimus, Bound, & Waidmann, 1999; Geronimus, Bound, Waidmann, Hillemeier, & Burns, 1996), cardiovascular disease (Diez-Roux et al., 2001; Haan, Kaplan, & Camacho, 1987; James, 1999; Pickett & Pearl, 2001), infant mortality and low birth weight (Roberts, 1997), and poorer mental health (Fitzpatrick, LaGory, & Ritchey, 1999). Yet educational researchers have been slow to link environmental health hazards with depressed academic performance, with the notable exceptions of lead and asbestos.¹ This empirical oversight has important implications for desegregation scholars interested in considering the racial and environmental health of neighborhood schools, rather than characteristics of individual students, to achieve diversity and educational equity.

In California, the issue of children's environmental health in schools is particularly important because many old schools, and the majority of new schools, are located in overcrowded urban areas where local air quality is relatively poor (Pastor, Morello-Frosch, & Sadd, 2006). For example, San Francisco County, with around 1% of the state's students, has more than 10% overcrowded schools. Given that many of the students in these schools already face severe residential segregation and socioeconomic challenges, assessing the potential environmental health impacts of poor air/soil quality or polychlorinated biphenyls (PCBs) exposure is particularly important in terms of identifying potential ways for diversifying

student assignment plans, improving children's health, and increasing academic performance.

Previous investigations of children's environmental health in segregated and desegregated settings prompt a series of questions about the relationship between race, poverty, environmental health, and educational outcomes. What is it about living in certain communities that leads to poor health and educational outcomes? How can environmental health factors affect educational outcomes and student assignment plans? And what can be done to improve educational and health outcomes for all students?

Researchers are now moving beyond descriptive relationships among race, space, place, and waste, and toward an understanding of the underlying causes and how they interact and have a cumulative impact. Conceptual frameworks describing potential relationships can provide a foundation for generating specific research hypotheses and effective intervention strategies. Accordingly, I introduce a conceptual framework for examining eco-apartheid as a specific manifestation of structural racialization that limits Black people/people of color from accessing key institutional resources and privileges that promote health and academic achievement. The model discusses the macro (sociohistorical), meso (e.g., community capital and built environments), and micro (i.e., achievement-oriented and health-related behaviors) pathways through which processes of environmental inequality influence health and educational outcomes. My intent is to bring together research on race-based school segregation with epidemiological research on health disparities and educational research on opportunity gaps to create a conceptual framework capable of generating research hypotheses that can be tested empirically.

ECO-APARTHEID: A FRAMEWORK FOR UNDERSTANDING THE RACIALIZATION OF SPACE

Eco-visionary and former White House environmental advisor Van Jones introduced the term in *eco-apartheid* in 2007. He defined it as

a situation in which white and affluent communities reap the tremendous benefits of clean and green economic development, while communities of color fall further behind. In a state of eco-apartheid, benefits of the new economic activity that the green wave generates will bypass the very communities most in need of new investment, new jobs and better environmental stewardship. (Jones, 2007; also see Jones, 2008)

Although powerful, Jones's definition of eco-apartheid is constructed as if it were a socioeconomic phenomenon that could happen to communities of color in the future, rather than an ecological component of structural racialization that began in the past, is happening in the present, and is informing the future. Thus, I extend Jones's definition into a systems theory that examines the ecological dimensions of structural racialization in producing and reproducing educational and economic inequality (see Table 1).

Table 1. Forms of Apartheid

Academic	Ecological
1. Shortage of qualified teachers (Darling-Hammond, 1997)	1. Overburden of toxic emissions (Pastor, Sadd, & Morello-Frosch, 2007)
2. Inadequate instruction materials	2. Lack of access to adequate health care (Williams & Jackson, 2005)
3. Overcrowded facilities	3. Urban grocery gap: Lack of access to fresh produce/grocery stores
4. Lack of access to Advanced Placement courses (Oakes, 2004)	
5. Underrepresented in colleges and universities	4. Hyperconcentration of schools next to TRIs (Morello-Frosch et al., 2002)
6. Overrepresented in suspension and dropout (Fine, 1991; Noguera, 2003)	

Note. TRI = Toxic Release Inventory.

Additionally, eco-apartheid as a systems theory builds on the insights of Professors John O. Calmore and John A. Powell by identifying the structural forces through which underlying racial, political, and economic conditions influence aspects of the environment, thereby affecting individual and community health (Calmore, 1998; Powell, 2008). As a distinct ecological component of structural racialization, eco-apartheid challenges researchers to extend traditional understandings of racism in which individuals intentionally or unintentionally target others for negative treatment because of their skin color or other cultural characteristics. In an eco-apartheid framework, this individualistic conceptualization is too limited. Instead of being wedded to an individual conceptualization of racism, or an institutional analysis of racism that recognizes the ways in which practices and procedures within institutions can perpetuate racism without relying on racist actors, an eco-apartheid framework shifts our attention from the "single, intra-institutional setting to inter-institutional arrangements and interactions" (Powell, p. 796).

According to Powell (2008), "Research in the field of dynamic and complex systems theory teaches that structures matter. The structure of

a system gives rise to its behavior” (p. 791). An eco-apartheid approach helps illuminate the ways in which historical legacies, individuals, structures, and institutions work together to distribute material and symbolic advantages and disadvantages along racial lines (powell). At the macro level, eco-apartheid helps us analyze how health, housing, education, transportation, and other systems “interact across domains and over time to produce unintended consequences with clear racialized effects” (powell, p. 791). Such an approach allows researchers to move beyond individualized understandings of “meritocracy” to demonstrate the ways in which all groups are interconnected and how structures shape command over resources and life chances (Akorn, 2008). At the level of cultural understanding, eco-apartheid shows how the structures we create, develop, and maintain in turn impact our racial and social identities by shaping the production of knowledge and naturalizing social meanings.

A central mechanism in an eco-apartheid framework that connects individuals to institutional resources and privileges is the relationship between racial identity, geography, and environmental toxins, or what Calmore called “the racialization of space.” According to Bonam (2010), physical locations are imbued with racial meaning. Her research is important because it affirms the idea that race can be located outside of the person and naturalized into the built environment. From this perspective, race encompasses more than personal identity (i.e., Sellers & Shelton, 2003; Sellers, Smith, Shelton, Rowley, & Chavous, 1998). The built environment itself becomes “an index of attitudes, values, behavioral inclinations, and social norms of the kinds of people living there” (powell, 2008, p. 793). Race-place associations are important because they demonstrate how people attach racial meaning to a range of locations, as well as negatively stereotype and feel less connected to perceived Black spaces. This negative stereotyping and lack of connection to Black space is one of the ways race reaches beyond human form and becomes embedded in the built environment (Bonam). Uninterrupted, these structures reproduce and naturalize social meanings. The transformation of internal and external meanings has the power to transform these stereotypes and structures, as well as the other way around.

In an effort to ensure that the model pays careful attention to interinstitutional arrangements and interactions, as well as the relationship between theory, research, and praxis, I add to the model elements of critical race theory. More specifically, in 2010, Chandra L. Ford and Collins O. Airhihenbuwa published an article entitled “Critical Race Theory, Race Equity, and Public Health: Toward Antiracism Praxis” in the *American Journal of Public Health*. This work illustrated how critical race theory can inform public health research by emphasizing the historical

and sociopolitical roots of contemporary racial disparities, health equity, structural forces, and the links between community-based participatory research and community capacity building.

According to Ford and Airhihenbuwa (2010), at least six elements form the basic perspective of a newly developed public health critical race framework: (1) race consciousness—explicit acknowledgement of the workings of race and racism in social contexts; (2) experiential knowledge—ways of knowing that result from critical analysis of one’s personal experience; (3) ordinariness—the understanding that racial advantages and disadvantages are normalized rather than aberrational; (4) centering the margins—being inclusive of all perspectives while explicitly making the perspectives of marginalized groups central; (5) praxis—the iterative process by which the knowledge gained from theory, research, and practice informs one another; and (6) public health—the practice and science of protecting and improving the health of communities. These six themes are not new, however, collectively they represent a challenge to the existing models of examining racial inequality in health and education (Dixson & Rousseau, 2006; Ladson-Billings & Tate, 1995).

By integrating the newly developed public health critical race framework into the eco-apartheid conceptual model, I highlight how policies and practices sustain White privilege through subtle, institutional, and apparently nonracial means. Through the lens of eco-apartheid, researchers are able to understand a range of racisms and classisms that shape the educational landscape and to illuminate the functional relationship between race, space, place, and waste—in particular, between neighborhoods and schools and how their interaction reproduces environmental health and achievement outcomes in classrooms and communities.

ECO-APARTHEID: A CONCEPTUAL FRAMEWORK FOR LINKING ENVIRONMENTAL HEALTH TO EDUCATIONAL OUTCOMES

The conceptual framework I propose here for understanding the implications of structural racialization for health and educational outcomes emphasizes the interplay of sociohistorical processes with the built environment, environmental toxins, and social mobility. In constructing this framework, I have built on a conceptual model for linking social determinants of health to social mobility, which was developed by Schulz and Northridge (2004) and draws on urban planning, environmental sociology, and social epidemiology. The eco-apartheid model specifically outlines the multiple and dynamic pathways through which underlying racial, political, and economic conditions influence aspects of the

environment, thereby affecting health and educational outcomes (Calmore, 1998; powell, 2008; Schulz & Northridge).

Because the scope of the model is too broad to cover adequately in one article, I have elected to focus attention here on a narrower range of exposures, namely, those that centrally involve sociohistorical process that remap existing structural conditions onto existing inequalities through the built environment. I follow Schulz and Northridge (2004) by defining the built environment as “the buildings, spaces, and products that are created or significantly modified by people and the *natural* environments to comprise everything else” (p. 456). The model I develop and present next (Figure 1), titled *Eco-Apartheid: Linking Environmental Health to Educational Outcomes*, helps to delineate how racial, political, and economic processes—operating individually, jointly, or cumulatively—interact with features of the built (and natural) environments to influence social mobility.

The model posits that at the macro level (e.g., legal, political, and economic systems), the social and cultural relationships that we produce are transformed into institutionalized systems of inequality through ideology, education, media, technology, identity, politics, cultural practices, and the legal codes that govern society. These institutionalized systems of inequality include, but are not limited to, advantages and disadvantages based on race, ethnicity, language, immigration status, gender, sexuality, ability, and age. For example, in Berkeley, like in many cities across the United States, race has been and remains a powerful organizing feature in everyday life, and racial categories reflect and reinforce group differences in access to institutional resources and privileges. The racial, political, economic, educational, environmental, and legal processes—and the unequal distribution of wealth and material and symbolic resources that they produce—are included in the model as sociohistorical (macro level). That is, the model seeks to identify the existence of unequal outcomes, the mechanism behind these outcomes, and the pathways through which inequities can be interrupted and transformed.

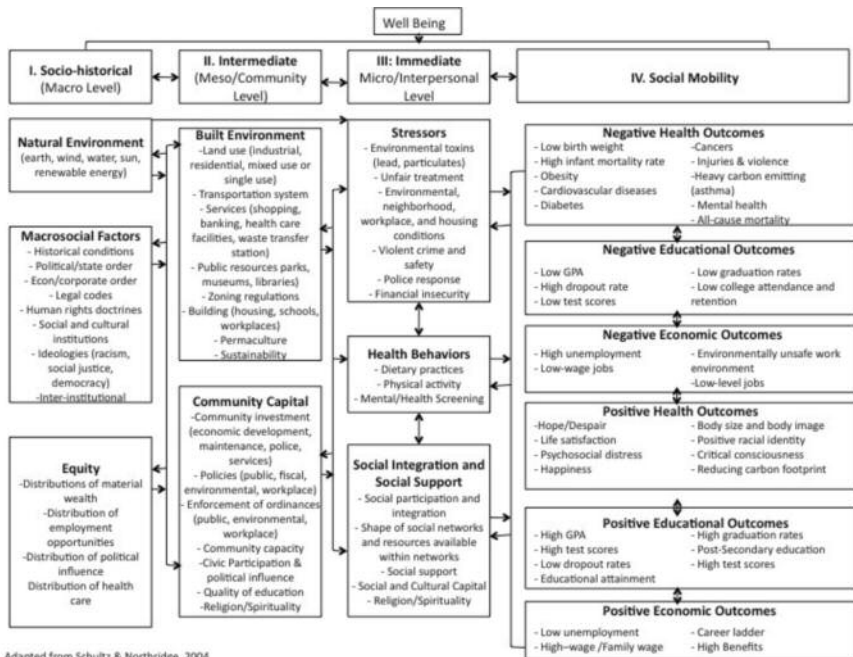
The racialization of space and the concentration of wealth and poverty that influence the built environment are included in our model as intermediate factors (also called meso level). In Berkeley, Oakland, and Richmond, California, where I have conducted community-based participatory research, for example, African American communities have fewer social, economic, health (e.g., access to fresh produce), and educational resources and experience greater environmental exposure to noxious land uses, incinerators, and polluting industries. These access issues are compounded by associated physical and psychosocial stressors. For example, the abundance of liquor stores or the absence of grocery stores,

housing instability, financial insecurity, lack of adequate public transportation, lack of well-maintained public parks that facilitate physical activity, and violent crime are considered in our model as intermediate/meso factors (Alameda County, 2009).

The intermediate factors identified in the conceptual model are of particular interest to desegregation scholars concerned with the relationship between environmental health disparities and educational outcomes. It is here that public and private interests and community action can intervene to transform sociohistorical factors that contribute to racialized health, educational, and socioeconomic disparities, and simultaneously influence interpersonal/proximate factors that lead to improvements in environmental health, education, and economic well-being.

Interpersonal factors are observable at the individual or proximate level. There is empirical evidence that interpersonal factors, such as exposure to environmental stressors, health behaviors, and achievement-oriented behaviors, interact with intermediate factors, such as community capital and social support, to produce health, educational, and socioeconomic well-being (Lantz et al., 1998).

Figure 1. Eco-apartheid: Linking environmental health to educational outcomes



In summary, the emphasis in the eco-apartheid model (Figure 1) is on the ecological implications of structural racialization and sociohistorical processes (macro-level factors) for the built environment and community capital (intermediate factors) that are influenced by interpersonal factors that ultimately may result in improvements in environmental health, education, and economic well-being. At least three important implications of this dynamic model are important to highlight here. First, because the model emphasizes the linkages between sociohistorical processes, structural racialization, and the dynamic pathways in which inequality is produced and reproduced, I am able to present a framework that recognizes the existence of unequal outcomes, the mechanisms behind these outcomes, and pathways in which inequities can be interrupted and transformed. Second, because the model emphasizes dynamic reflexivity (represented by bidirectional arrows and columns), each aspect of the model is related to, and may be influenced by, the others (Schulz & Northridge, 2004). Third, the model emphasizes agency. That is, inequalities are produced and reproduced through social actions that have the potential to change through multiple interventions at various levels (systems, community, individual). Yet, I recognize the limitations of presenting a conceptual model as a series of arrows and boxes because these social processes are far more complex than what can be visually represented in Figure 1. Nevertheless, my hope is that this simplified model will help highlight linkages between macro, meso, and micro—sociological phenomena that affect individual and community health, educational, and economic outcomes (Schulz & Northridge).

EXAMINING PROCESSES OF ECO-APARTHEID ACROSS THREE GENERATIONS OF DESEGREGATION RESEARCH

In this section, I review how aspects of the eco-apartheid framework are expressed in the literature by providing a critical overview of past and current desegregation research, its relationship to educational policy, and the promising new directions. Most desegregation research can be grouped into three generations that fall into two categories: long-term effects that measure educational and occupational attainment and changes in racial attitudes, and short-term effects that focus on improvements in academic outcomes (Bankston & Caldas, 1996; Hawley, 2002; Meier, Stewart, & England, 1989; Mickelson, 2001; Sze & London, 2008; A. S. Wells & Crain, 1994, 1996). Next, we review three generations, paying careful attention to the field's growth and diffusion.

FIRST GENERATION

First-generation desegregation research and litigation focuses on the elimination of physical barriers to desegregation, particularly race and poverty, rather than race, poverty, and the built environment. Initiated by the *Brown* decision and anchored by the 1964 Civil Rights Act, first-generation desegregation work generally documents how the racial composition within a single district impacts educational outcomes and access to institutional resources and privileges.² Notable cases include *Green v. County School Board of New Kent County* (1968), which established that school systems must eliminate discrimination and establish equity in six areas, often called the *Green* factors, in order to achieve “unitary status”; these factors include student assignment, faculty assignment, staff assignment, facilities, transportation, and extracurricular activities. Other important cases include *Swann v. Charlotte-Mecklenburg Board of Education* (1971), which affirmed the use of mandatory busing of students out of neighborhood attendance areas as a permissible means to achieve racial balance (Raffel, 2002), and *Keyes v. Denver School District* (1973), which afforded Latinos the right to desegregated schooling. For the country, the *Keyes* decision was particularly important because it mandated desegregation in the North and extended it to whole districts rather than just single schools (Orfield & Eaton, 1996). However, even though the Supreme Court recognized the rights of Latinos to desegregated schooling in 1973, similar to *Brown*, there was little enforcement, and as a result, desegregation lagged (Arias, 2007).³ In the late 20th century, many first-generation desegregation researchers have focused on school resegregation, which, since the 1990s, has continued to grow in all parts of the country for African Americans, Latinos, and Southeast Asian students.⁴ Latinos and Southeast Asians, in particular, face not only increasing racial and spatial segregation, but often the “triple threat” of being segregated by race, class, and language. Locked into neighborhoods with crumbling economic bases and a dilapidated infrastructure, many segregated Black and Latino schools have been sanctioned for failing to meet the requirements of No Child Left Behind. These high-poverty schools account for a significant portion of the dropout rate, or what Michelle Fine (1991) called the “push out rate,” that lies at the center of the nation’s dropout crisis.

SECOND GENERATION

Second-generation desegregation research and litigation attempt to examine inequalities within schools rather than between schools by

focusing on tracking, test score data, or curriculum grouping of core academic classes (Armor, 1995; Oakes, 2004; Valenzuela, 1999). As with first-generation work, which called for racial balance in schools, the demand for racial balance in the classrooms is motivated by the harm/benefit thesis. The harm/benefit thesis states that “if schools, staff, and programs are thoroughly integrated and resources allocated equitably, the psychological and educational harm of segregation would be eliminated,” and Black and Brown children “would be able to compete with whites on an even footing not only in school, but in their adult lives” (Rossell, Armor, Walberg, 2002, p. 5).

The harm/benefit thesis was prominent in the first-generation work of Professor Kenneth B. Clark of the City College of New York. In his testimony in *Brown*, Clark described an experiment in which he asked Black children questions about the relative attractiveness of a Black doll and a White doll. A majority of Black children preferred to play with the White doll, indicated that it was a “nice color,” and said the Black doll looked “bad.” Professor Clark concluded that de jure segregated schools had a detrimental effect on the self-esteem of Black children.

I think it is the desire of the Negro to be a human being and to be treated as a human being without regard to skin color. He can only have pride in race—and a healthy and mature pride in race—when his own government does not constantly and continuously tell him, “Have no pride in race,” by constantly segregating him. (Kluger, 1976, p. 498)

The notion that school desegregation benefits Black and Brown children and youth, independent of eliminating racial discrimination, “gained support from the 1966 Coleman report and the 1967 U.S. Commission on Civil Rights report which found that Black children who went to school with whites had higher achievement” (Rossell et al., 2002, p. 5). More recently, Jeannie Oakes’s second-generation research in desegregated school systems in San Jose, California, and Rockford, Illinois, demonstrated that students of color have radically different and unequal schooling experiences depending on their race and social class, even in schools that are technically desegregated (Mickelson, 2001; Oakes, 1995). Because of second-generation segregation in the form of tracking, even school districts operating under court-mandated desegregation plans have normalized the resegregation of students. Consequently, “courts have held the use of tracking to intentionally separate students of color from white students as violating the Fourteenth Amendment guarantees of equal protection under the law” (Mickelson,

p. 223). Notable second-generation cases include *Hobson v. Hansen* (1967), in which the court held that the use of tracking to intentionally separate Black and White students was unconstitutional because Black students were disproportionately in lower tracks, and *Quarles v. Oxford* (1989), in which the district court judge found the school district to be unitary despite allegations by the plaintiffs that their achievement-grouping practices were racially discriminatory. For a nuanced history of jurisprudence concerning tracking, racial balancing, and the struggle for desegregated schools, see Orfield & Eaton (1996), Rossell et al., and Welner (2001).

THIRD GENERATION

A new and promising direction in the field of desegregation research and litigation rests in an entirely different way of defining the harms of segregation and the benefits of desegregation. Schools segregated by race and class (and sometimes language) remain highly unequal in terms of funding, teacher quality, quality of the curriculum, expectations, enrichment, and other key aspects of schooling (Carter, 2010; Orfield, 2009; R. Wells, 2010). Segregated schools are unequal not because of anything inherent in racial and ethnic identities, but rather because a structural racialization approach illuminates the interinstitutional actions and arrangements that lead to urban disinvestment and residential segregation and produces disproportionately vulnerable communities. Individual framing misdirects our attention. An eco-apartheid approach redirects our attention to the ways in which racism is still active on multiple levels—internalized, interpersonal, ideological, institutional, and interinstitutional—and impacts health and educational outcomes. The application of an eco-apartheid approach changes our analysis of responsibility and propriety of response. Take, for example, the amicus brief of the Caucus for Structural Equity in *Parents Involved in Community Schools v. Seattle School District No. 1*. In this case, the brief emphasized the interinstitutional relationships between residential segregation and educational segregation in shaping educational outcomes (Caucus for Structural Equity [CSE], 2007). The CSE argued that local school boards should be empowered to intervene in the processes that perpetuate racial segregation, even though redressing the root cause was in large measure beyond their institutional control (CSE). This approach has important implications for remedy and response, as well as for our understanding of the harms of segregation and the benefits of desegregation (powell, 2008).

Although third-generation researchers have identified environmental health as an important factor impacting access for students of color, their

understanding and analysis of environmental toxins and their impact on educational achievement have been limited (with the notable exceptions of lead and asbestos). As a result, a promising new direction in desegregation research and litigation may lie in identifying the dangers to children's health associated with PCBs or other environmental toxins and developing plans and regulations to remediate contaminated school buildings and soil. PCBs were commonly used in the construction of schools in the 1960s and 1970s. However, in 1977, in acknowledgment of the negative health effects of these compounds, Congress banned most uses of PCBs in building construction (Fromme, Baldauf, Klautke, Piloty, & Bohrer, 1996). PCBs are dangerous because, unlike lead or asbestos, they are not harmless if left undisturbed (Herrick, McClean, Meeker, Baxter, & Weymouth, 2004). Rather, PCBs can move from window seals to the air or ground without any physical evidence of decay or alteration of the surrounding building materials (Ljung, Olsson, & Tolstoy, 2002).

Third-generation desegregation research and litigation suggest that the presence of PCBs in our nation's schools is a problem that requires immediate legislative and community action. Buildings constructed during the 1950s and 1960s are likely to contain PCBs in their materials. In New York City alone, 260 schools were constructed during the period when PCBs were routinely used in window caulking (Rahman, 2009). In 2008, in groundbreaking litigation, the Yorktown School District in New York State sued the Monsanto Company, urging the defendants to pay the cost for cleaning up contaminated schools and soil that were remediated with taxpayer money to clean up tainted chalk (Watnick, 2009). Shortly after the Yorktown School District's federal lawsuit, more concerns were raised about PCBs in New York City by the *New York Daily News* (Egbert, 2009). Their testing revealed dangerously high levels of PCBs in the caulking of 8 out of the 9 New York City public schools tested (Irwin 2008; Watnick). These findings were distressing locally and regionally, but even more so because of their national implications. According to Watnick, "New York City's public school system is the largest in the nation, serving over 1.1 million students and operating over 1500 schools[;] these PCB findings serve as a 'tip of the iceberg' warning to school districts, parents, and lawmakers nation wide" (p. 236).

Scientists and research link exposure to PCBs to lower birth weight, decreased head circumference at birth, higher incidence of behavioral disorders, and lower IQ scores in children (World Health Organization, 2000). Additionally, PCB exposure may also damage the liver, skin, immune system, reproductive system, and gastrointestinal tract (World Health Organization). Indeed, recent empirical evidence suggests that children and youth are more susceptible to the effects of environmental

pollution than adults because of critical differences in physiology, metabolism, absorption, and exposure patterns (Crom, 1994; Kaplan & Morris, 2000; Morello-Frosch et al., 2002; Schettler, Solonman, Valenit, & Huddle, 1999). Third-generation research and litigation assert that just as regulators acted on lead and asbestos concerns decades ago, we must act now to curtail the dangers of PCBs and other environmental toxins in or around school buildings.

The Williams case, settled in 2004, may lay the groundwork for such an approach. In this case, plaintiffs argued that the State of California was failing to provide thousands of public school students, particularly those in low-income communities and communities of color, with the bare minimum necessities required for an education, such as textbooks, trained teachers, and safe and clean facilities (IDEA & UCLA's Institute for Democracy, Education & Access, 2001). The state's failure to provide these bare-minimum necessities to all public school students violated the state constitution, as well as state and federal requirements that all students be given equal access to public education without regard to race, color, or national origin. Specifically, the lawsuit sought to remedy the following school conditions: lack of instructional material, inadequate instruction, massive overcrowding, and inadequate, unsafe, and unhealthy facilities. It is this last condition—inadequate, unsafe, and unhealthy facilities—that may hold the key to future third-generation desegregation research and litigation. According to the California Department of Education (2009),

The case was settled in 2004, resulting in the state allocating \$138 million in additional funding for standards-aligned instructional materials for schools in the first and second ranks (known as deciles) determined through the 2003 Academic Performance Index (API) Base. The settlement includes another \$50 million for implementation costs and other oversight-related activities for schools in deciles one through three (2003 API Base). These two amounts were included in the state budget signed in July 2004 by Governor Schwarzenegger. Another \$800 million will be provided for critical repair of facilities in future years for schools in deciles one through three (2003 API Base). The settlement will be implemented through legislation adopted in August 2004: Senate Bill (SB) 6, SB 550, Assembly Bill (AB) 1550, AB 2727, AB 3001. Up to 2.3 million California public school students may benefit from funding from the Williams case settlement.

In many ways, the Williams case embodies the notion of distributive justice (i.e., the distribution of environmental harms, benefits, and resources across different populations and sites). If lawyers and social science researchers can begin to apply the notion of distributive justice to school desegregation cases more broadly—particularly to assess whether a school system has achieved nondiscrimination and equity, and eliminated all “vestiges” of the prior segregated system to the extent practicable—then it may be possible to challenge under what condition courts grant “unitary status” (Rossell et al., 2002). In this manner, the Williams and Yorktown cases, and cases like them, begin to set important precedents that suggest that if public schools contain PCBs, are located next to toxic release inventory facilities or other polluting industries, or are infested with vermin and roaches, then parents and students have the right to hold cities, schools, states, and, in some cases, the federal government accountable (i.e., through litigation or other means) precisely because these agencies are responsible for providing public school students with equal access to safe school facilities.

The ways in which race, space, place, and waste interact to limit people of color, particularly youth of color, access to institutional resources and life opportunities are major human and civil rights issues of the 21st century (Cammarota, 2010; Camangian, 2008; Duncan-Andrade, 2009; Ginwright, 2009; Morrell, 2007; Noguera, 2003; Stovall & Delgado, 2009; Yang, 2007). By adding an eco-apartheid lens to previously individual and institutional analyses of racism, third-generation scholars and activists arrive at more accurate diagnostic tools for analyzing social inequalities that develop along racial lines. An eco-apartheid analysis will help third-generation scholars and activists to identify macro-, meso-, and micro-level dynamics that have consequences for all people living in America, and the policy areas that need to be addressed to achieve health, educational, economic, and environmental equity.

In the following section, I apply the eco-apartheid framework to trace several pathways through which racial inequalities intersect with environmental health and educational outcomes in the city of Berkeley. Applying the conceptual model to the city of Berkeley helps us better elucidate possible mechanisms through which racial inequalities contribute to health disparities and influence educational and economic outcomes. Many of the built environment and community capital interventions (intermediate/meso) combine the tools of urban planning with urban education in an effort to achieve the goals of diversity and racial balance, and meet the social and material needs of students. Intermediate interventions, carefully applied, are important because they can act to reduce educational disparities through their influence on interpersonal factors.

APPLYING THE CONCEPTUAL FRAMEWORK IN PRACTICE:
A CASE STUDY OF BERKELEY

SOCIOHISTORICAL CONTEXT: THE RACIALIZATION OF SPACE IN
BERKELEY

Between 1964 and 1968, Berkeley changed the political history of urban and suburban America. The Black Panther party, the free speech movement, civil rights confrontations, and massive Vietnam war protests helped Berkeley to emerge as a hotbed of radical thought and a city committed to deconstructing the glaring contradictions of U.S. consumer capitalism: poverty amid wealth, suburban growth and urban decline, racism within the heart of liberalism.

To view the movement toward desegregation in Berkeley apart from processes of structural racialization misses the ways in which the articulation of civil rights at the national level influenced local struggles over fairness, the meaning of merit, and racial and ethnic identity. If Berkeley residents could translate the rhetorical promises of liberalism into real gains for Black Americans in education, employment, and housing, then the dream of *Brown*—that is, educational equity in social and political life—could be achieved.

Thus, to understand what was happening in Berkeley's landscape after 1964, when Berkeley first integrated its elementary schools, we must travel deep into local planning and political processes while keeping in mind the broad structural changes fostered by the civil rights movement and the federal government—for postwar desegregation was as much a product of local planning and politics as of national trends and broad patterns of racial justice.

In Berkeley, the superintendent, school board, teachers' groups, PTA chapters, civil rights groups, citizen action committees, and individuals planned the logistics of desegregation. Because Berkeley was the first city in the United States to voluntarily desegregate, it charted new territory in thinking longitudinally about pedagogical issues and student assignment. "What plan could achieve the greatest racial mixing with the least time spent on the school bus? Which children would spend what portion of their school lives attending school outside of their neighborhood? What should be the grade structure of the primary schools?" (Kirp, 1982, p. 16). In Berkeley, a combination of intermediate (meso) and interpersonal (micro) factors helped to transform sociohistorical processes that contributed to educational disparities through multiple pathways and simultaneously directly influenced interpersonal factors that led to both individual and community health and well-being.

Teachers were involved in the desegregation process by participating in “school swaps,” a unique program in which teachers observed and taught at schools with racial compositions substantially different from their own. Students were involved through field trips and youth councils. The goal was to demonstrate that schools needed to make drastic changes to shift from catering to the needs of White students to all students. What had begun in 1954 as a call by the NAACP to desegregate schools had grown over time in Berkeley into a social movement.

By 1962, the Congress of Racial Equality (CORE) declared to the Berkeley school board that “giant accomplishments” had been made with respect to race and schooling, but far more needed to be done (Kirp, 1982). A system of de facto segregation emerged in Berkeley elementary schools; in 1960, 92% of Black students attended 6 of the city’s 14 elementary schools. During this time, the district increasingly ran two separate school systems: one by and for educated, affluent Whites in the hills, and the other operated by the same people for poor Blacks in the flatlands. Black youth were not even allowed to swim in the Berkeley High pool.

Segregation undermined the Black community by decreasing property values and access to institutional resources and privileges (Bonacich & Goodman, 1972). In Berkeley, housing segregation was the product of an invisible network of financial companies, banks, federal subsidies, real estate brokers, developers, and homeowners working in concert to privilege White interests (Massey & Denton, 1993). “It is real estate brokers, builders, and mortgage finance institutions,” the U.S. Commission on Race and Housing contended in 1958, “which translate prejudice into discriminatory action” (Self, 2004, p. 160).

First Telegraph Avenue, and then later, Grove Street and Shattuck Avenue, served as the red line dividing the Black flatlands from the White foothills and hills. As in other California cities, the geographic and geological dividing line between the hills and flatlands took on a socially constructed meaning. At the built environment and intermediate levels, racial and class inequalities became synonymous with the spatial distinction between hills and flatlands. This racialization of urban and suburban communities underscores the development of eco-apartheid and the role of macro, meso, and micro factors in the formation of racialized educational and neighborhood space. For Whites in particular, eco-apartheid is a key component of what David Roediger (1999) referred to as the “wages of whiteness” (p. 1)—mechanisms and processes that have allowed Whites to receive racial privileges without overtly claiming racial superiority (Bullard, Johnson, & Torres, 2004; Roediger).

By the early 1960s, the link between White class mobility and racial seg-

regation, institutionalized in government and private sector urban development practices, had become so common in Berkeley as to not require further elaboration. Black people were relegated to living in heavily industrial zoned communities or locally unwanted land (LuLus) in south and west Berkeley with higher incidences of polluting industries and incinerators. Black children made significant strides in educational attainment, but the gap between Black children from the flatlands and White children from the hills remained large and subsequently began to increase. Nationally standardized tests showed a painful division; one fourth of Berkeley's children scored in the bottom 10%, and one third scored in the top 10% (Metz, 1979; Rorabaugh, 1990).

The combination of high concentrations of poverty, a deteriorating built environment, reduced opportunities for employment, and exposure to multiple stressors—including noxious odors, particulate matter, emissions from local industries, illegal dumping, occupational hazards, financial stressors, and concerns about crime and safety—characterized life for many Black residents in Berkeley who were disproportionately likely to have incomes below the poverty line.

DESEGREGATION IN BERKELEY

To remedy de facto residential segregation between 1964 and 1995, the Berkeley Unified School District (BUSD), a district of roughly 9,000 students, used mandatory busing to racially balance its elementary schools. The district's desegregation plan relied primarily on crosstown mandatory busing and the pairing of K-3 schools with four to six schools in different neighborhoods. The district additionally created two junior high schools as part of the desegregation plan. The junior high schools' attendance zones were strategically drawn in a manner that ensured racial integration of the two schools by cutting across city boundaries. This constituted the original BUSD plan to eliminate de facto school segregation in Berkeley and demonstrates how educational interventions at various levels (community-wide, regional, and nationally) aim to improve student achievement by addressing various aspects of racial processes and/or built environments.

In 1968, Berkeley became one of the first districts in the country to voluntarily desegregate its schools. Since that time, Berkeley has been at the national forefront of desegregation efforts. From roughly 1970 to 1995, there were sweeping demographic changes in the Bay Area and beyond—including massive immigration. Because of reasons BUSD explained as “demographic changes” and “budget constraints,” as well as the failure of the experimental schools project, several schools began to

become racially unbalanced. Additionally, parents and teachers expressed concern about disruptions that occurred within the “paired school” plan, which required students to change schools after the third grade. Collectively, these factors necessitated the development of a new and improved student assignment plan to preserve the desegregation of public schools.

In 1995, after 6 years of planning, evaluation, and community deliberation, the new plan was unveiled—it was described as “controlled choice.” According to the controlled choice plan, schools were to be reconfigured into a K–5 (Elementary) and 6–8 (Middle) model. Additionally, the district decided to divide the city of Berkeley into three elementary zones that cut across city boundaries and give parents a choice of sending their child to a school in one of the three zones. The schools were required to meet certain zonewide racial proportions of three racial categories—Black, White, and other ethnicities—at a ratio of plus or minus 5%. The catch was that if a zone did not meet the stipulated criteria, the district could override the parent’s choice and redirect the destination of a child’s school attendance to achieve racial balance.

In 1996, the passage of Proposition 209—a state law banning affirmative action—forced BUSD to once again alter its desegregation policy to comply with the new state law. In 2000, then BUSD superintendent Jack McLaughlin assembled a student assignment advisory committee to develop alternative policies that would comply with Proposition 209 but maintain the values of desegregation. In 2002, the current student assignment plan was implemented and retained many of the features of the 1995 plan, including crosstown busing at the elementary level. Yet, the most striking difference from the 1995 plan lay in the evolving notion of the term *diversity*. In 1995, diversity was defined in racial terms and focused primarily on individual racial characteristics. Today, Berkeley’s plan promotes diversity by taking into account the demographics of the neighborhoods where students live, including parental education level, family income, and race and/or ethnicity (Bhargava, Frankenberg, & Le, 2008).

In 2004 and 2007, parents represented by the Pacific Legal Foundation sued the district, claiming that Berkeley’s desegregation plan violated Proposition 209. The Legal Defense Fund (LDF), the ACLU of Northern California, and the Lawyers’ Committee for Civil Rights filed a motion to intervene on behalf of several Berkeley parents and the local NAACP, who joined to support the BUSD’s student assignment/voluntarily desegregation plan. In supporting the school district and rejecting the lawsuit, Alameda County Superior Court Judge James Richman ruled in April of 2004 that “Although Proposition 209 specifically applies to public

education, its text does not mention voluntary desegregation plans or otherwise indicate that prohibited discrimination or preferential treatment includes a race-conscious school assignment plan that seeks to provide all students with the same benefit of desegregated schools.” The series of legal decisions to uphold Berkeley’s plans to promote diversity have statewide and national implications on at least three levels: (1) the statewide implication is that Prop 209 cannot block critical efforts by state school districts to provide a quality desegregated education; (2) nationally, the Berkeley decision points the way for similar school districts—for example, Louisville, Kentucky, and Seattle, which were limited by the Supreme Court to use race to assign public school enrollment—to modify their student assignment plans by taking into account neighborhood demographics⁵; and (3) the Berkeley decisions may open the door for broader racial neighborhood demographics, such as environmental health and racialization of the built environment, to be used in certain circumstances to achieve school desegregation goals.⁶

In short, the arsenal of tools available to public school districts seeking to achieve or maintain racial diversity is a highly contested issue. Court rulings have addressed desegregation plans in Louisville; Seattle; Berkeley; Los Angeles; Hartford, Connecticut; and Lynn, Massachusetts; in the cases of Louisville and Seattle, in particular, the majority justices disagreed on whether and how race may be considered a factor in public school admissions. So, the role of race as a factor in diversifying student assignment plans remains unclear. However, what we do know is researches have found that the poverty rate of a school influences educational outcomes far more than the poverty rate of an individual and that low-income students achieve at higher rates if they live in middle-class neighborhoods and/or attend affluent schools (Orfield & DeBray, 2000). Studies also show that students of color in economically integrated schools in Raleigh, North Carolina, have experienced dramatic increases in test scores (Finder, 2005; Kurlaender & Yun, 2007). In Minneapolis and Louisville, attending a desegregated school has translated into increased academic achievement, increased educational attainment, higher test scores, and improved social networks (A. S. Wells, 2001).

Yet the eco-apartheid framework, when applied in practice, asks the question, Why not increase the support to neighborhood schools and communities through equitable housing, inclusionary zoning, low-income housing tax credits, and other innovative community investment strategies? If we supported neighborhood/segregated schools (and the communities that inhabit them) in the same ways that we support integrated or desegregated settings, our framework hypothesizes an increase in achievement, attainment, capacity building, civic engagement,

employment, and individual and community health. To interrupt processes of eco-apartheid will require comprehensive and strategic investment in public health, jobs, renewable energy, technology, libraries, housing, core institutions, infrastructure, classrooms, and communities.

CONCLUSION: PROMOTING ENVIRONMENTAL HEALTH AND EDUCATIONAL EQUITY

The framework for understanding eco-apartheid as an important cause of racial disparities in health and education has important implications for promoting environmental health and educational equity. The model highlights the multiple pathways in which sociohistorical processes connect individuals to institutional resources and privileges, racial identity, geography, and environmental toxins, or what Calmore (1998) called “the racialization of space.” As Szasz and Meuser (1997) noted, much of the literature on environmental inequalities is focused on the existence of unequal outcomes but has not proved much analysis of the mechanism behind these outcomes.

The eco-apartheid model (Figure 1) I have introduced stresses the linkages among three major points that have been neglected in previous desegregation research and scholarship. First, because the model emphasizes the linkages between sociohistorical processes, structural racialization, and the dynamic pathways in which environmental inequality is produced and reproduced, I am able to present a framework that recognizes the existence of unequal outcomes, the mechanisms behind these outcomes, and pathways in which inequities can be interrupted and transformed. Second, an eco-apartheid framework captures and includes subtle shifts from individual racism to an institutional racism, as well as an examination of interinstitutional arrangements, interactions, and cumulative causation that leads to durable racialized outcomes. Third, the model emphasizes agency and reflexivity (represented by bidirectional arrows and columns). That is, inequalities are produced and reproduced through social actions that have the potential to change through multiple interventions at various levels (systems, community, individual). Previous efforts to identify causation at a particular decision point within a specific domain understate the cumulative impact of structural racialization. However, the eco-apartheid framework reveals the much deeper workings of power in society (Pellow, 2007). Without an adequate understanding of the mechanisms that coproduce environmental, educational, and economic inequalities, our theories about how and why racial inequality is reproduced suffer. Moreover, we fail to provide the most useful tools for community members and policy makers who may seek to

remedy environmental and educational inequality through legislation and other means (Pellow).

The eco-apartheid framework provides a useful model for theory building in the study of environmental health and educational equity. Moreover, theories of racial and educational inequality in general would benefit from a more serious consideration of the role that environmental inequalities play across institutions. Existing research on desegregation remains in need of theoretical strength and methodological rigor with respect to environmental inequality. Future research should address these needs and build theory by defining, analyzing, and prescribing solutions for environmental health and educational equity within communities of color and poor people⁷ (Corburn, 2009; Israel et al., 2006; Ozer & McDonald, 2006; Wallerstein, 1992). It is my hope that the conceptual framework set forth in this article can contribute toward that end.

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Notes

1. Environmental health experts have also begun to recognize polychlorinated biphenyls (PCBs), commonly found in the caulking and sealing materials used to construct schools in the 1960s and 1970s, as environmental health hazards that also influence educational outcomes such as IQ.

2. The Supreme Court in *Swann* defined racial balance as each school's racial composition approximating the racial composition of the school district.

3. Latinos had won the right to integrated schooling in California in 1946 in the case of *Mendez v. Westminster*. The Ninth Circuit Court ruled that California law only permitted the racial separation of Asians from other students. It would not be until the *Brown* decision that racial separation in general was outlawed. For an examination of the disappointing course of Latino desegregation, 29943.doc see Arias (2007).

4. See *Dowell*, *Jenkins*, and *Pitts* Supreme Court cases.

5. According to the LDF, "On June 28, 2007, the Supreme Court issued a sharply divided decision in *Parents Involved in Community Schools v. Seattle School District* that

limited the ability of school districts to take account of race to promote diversity and address racial isolation in their schools. While a majority of the Justices recognized the critical importance of community efforts to promote diverse local schools and provide opportunities for children to learn, play and work together, the Court struck down particular aspects of the Seattle and Louisville student assignment plans because they were not, in its view, sufficiently well designed to achieve those goals. But the Court did not—as some reported—rule out any and all consideration of race in student assignment. In fact, a majority of Justices explicitly left the window open for school districts to take race-conscious measures to promote diversity and avoid racial isolation in schools” (Bhargava, Frankenberg, & Le, 2008).

6. In March 2009, the NAACP Legal Defense and Educational Fund (LDF), along with a coalition of civil rights groups, including the ACLU of Northern California, the Lawyers’ Committee for Civil Rights, and the ACLU of Southern California, successfully represented a group of parents who intervened to protect the student assignment plan in Berkeley, California against a challenge from Ward Connerly’s American Civil Rights Foundation. Berkeley’s plan seeks to promote diversity in its schools by taking account of the demographics of the neighborhoods where students live, including parental education level; family income; and race/or ethnicity. The California Appellate Court concluded that since the plan considers the racial makeup of neighborhoods, rather than characteristics of individual students, it did not constitute discrimination or the granting of a preference based on race and therefore, did not violate California’s Proposition 209.” Additionally, to pass strict scrutiny, a law or policy must satisfy three prongs. First, it must be justified by a compelling governmental interest. Second, the law or policy must be narrowly tailored to achieve that goal or interest. Finally, the law or policy must be the least restrictive means for achieving that interest.

7. Critical race theory emphasizes centering the margins and working with communities who are disproportionately impacted.

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