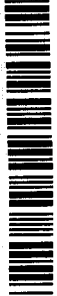


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Environmental Racism or Inequity: Comparative Study of Four Ethnic Groups

George O. Rogers

The disproportional distribution of pollution, risk, and environmental hazards among Black, Hispanic, poor, and working-class people is well documented. Racial and ethnically defined minorities are subjected to a larger proportion of hazardous and potentially hazardous facilities and sites than are Whites (Gore, 1992) while simultaneously receiving a smaller proportion of the benefits related to these economic activities. "Environmental racism defends, protects, and enhances quality-of-life choices available to whites at the expense of blacks" (Bullard, 1993, p. P30). This results from the systematic targeting of minority communities as sites for noxious facilities of various kinds: hazardous waste sites, garbage dumps, sewer treatment plants, and chemical plants, to name but a few. In short, locally unwanted land uses (LULUs) (Popper, 1981) are more likely to be sited in poor minority communities than in White-collar communities. This chapter examines environmental attitudes among Afro, Anglo, Hispanic, and Asian Americans in Texas in an effort to better understand the nature of these inequities.

Perhaps most important are the procedural obstacles faced by ethnic and racial minorities. For example, Bailey and Faupel (1992) described the Black community of Sumter County, Alabama, as politically disempowered and isolated, with little knowledge, and often inaccurate rumors regarding a waste disposal site being developed in the county. Even though Blacks reported greater concern for the environment than Whites, they were hesitant to take the risks associated with coming out against "the only positive economic development [in the area] to occur in the last decade" (Bailey & Faupel, p. 149). In contrast, the predominantly White organizations in Sumter County set goals to (a) establish rigorous monitoring, (b) provide greater public accountability, and (c)

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ensure free public access to information about operations of the landfill. After several public meetings, this organization gave way to another predominantly White organization with the stated goal to shut the waste facility down. It was not until 10 years into the landfill's operation that the predominantly White organization got Black leaders to oppose the facility.

Bullard (1993) pointed out that these differences result in procedural inequity, wherein people are treated inequitably by the environmental decision process. Blacks, Hispanics, and other minorities not only are subjected to greater hazard, poorer quality of life, and greater environmental stress than Whites, but also face economic, cultural, and racially motivated barriers to participation in the environmental decision process. These barriers take the form of all-White review panels, boards, and commissions; communication in forms not accessible to the affected public (e.g., language and literacy); and hearings in locations remote from the community. These minority communities have relatively little political or economic power to overcome these obstacles (Gore, 1992). Cultural differences can also produce marked differences in the foundation used to communicate about risk and environmental hazards (Rogers, 1992). For example, words and phrases often do not have a shared or common meaning. Whereas the "Not in my backyard" rallying cry has been preeminent among middle-class environmental activism, Bullard (1993) pointed out that it is "difficult for millions of Blacks to say, 'not in my backyard' [because] many do not even have a backyard" (p. 30). While there are economic factors involved in the disproportionate "sharing" of environmental risks (Bacow, 1993), these factors cannot make the situation fair if the siting process deprives the community of the information required for informed consent. Hence, procedural inequity exists when social classes face differential, and unequal, obstacles to participation in the environmental decision-making process.

HYPOTHESES

There are two categories of questions and resulting hypotheses concerning environmental inequity. The first includes issues related to the extent and nature of environmental inequity. The second consists of issues related to procedures and mechanisms of environmental justice.

Perhaps the most important question regarding environmental justice is the nature of its existence. Ecological studies (e.g., Asch & Seneca, 1978; Bullard & Wright, 1985; Commission on Racial Justice, 1987; Council on Environmental Quality, 1971; Freeman, 1972; U.S. General Accounting Office, 1983) certainly reflect a degree of inequity in the distribution of hazardous facilities and minority populations. Moreover, numerous cases studies (e.g., Bailey & Faupel, 1992; Bullard, 1983) demonstrate the appearance of environmental racism in the public processes used in connection with various hazardous waste facilities. Yet, to date, no study has examined the existence of environmental racism at the household level. Are minority households more likely than nonminority households to be exposed to hazardous or noxious facilities? Are minority households

closer than nonminority households to hazardous and noxious facilities? This yields the following null hypotheses:

H1_a: Minority households are no less likely than nonminority households to live in communities that are free of hazardous and noxious facilities.

H1_b: Minority households are no more proximate than nonminority households to hazardous and noxious facilities.

The ecological and case studies to date suggest that minority communities are more threatened than nonminority communities; hence it was expected in the present study that minority households would be more threatened than nonminority households.

Another direct assessment question concerns the extent to which facility owners and operators target communities of color to receive hazardous or noxious facilities (e.g., Bullard, 1993). Of course, the best test of this hypothesis would be the direct observation of corporate decision making regarding facility siting; however, this method was beyond the scope of the present research. Another explanation for the collocation of hazardous or noxious facilities and minority populations suggests that low land values attract both low-income people and industrial land use (e.g., Bacow, 1993; Gelobter, 1992). This suggests a "chicken and the egg" problem: Which came first, the hazardous facilities or the low-income minority households? In order to conclude that corporate structures are targeting minority communities for noxious and hazardous facilities it would have to be demonstrated that the minority populations preceded the facilities. This yields the following null hypothesis:

H2: Residential tenures among minority households are no more likely than residential tenures in nonminority households to precede facility tenures.

The corporate-targeting explanation suggests that minority households are located in the community prior to the location of the noxious or hazardous facility. Conversely, the mutual-tractor explanation suggests that facilities and minority households locate more simultaneously or even that households locate in the community after the noxious or hazardous facilities.

Another direct assessment concern involves the extent to which risks and benefits are shared among all groups in society. It has been convincingly argued that minority communities bear more of the risks and receive fewer of the benefits associated with toxic, hazardous, and noxious facilities than do non-minority communities (e.g., Gelobter, 1992; Lee, 1992; White, 1992). How are risks and benefits associated with hazardous and noxious facilities distributed? This leads to the following null hypotheses:

H3_a: Minority households are no more likely than nonminority households to bear the burden of risks associated with hazardous and noxious facilities.

H3_b: Minority households are no less likely than nonminority households to receive the benefits associated with hazardous and noxious facilities.

The existing literature suggests that minority communities bear a disproportionate share of the risks associated with hazardous facilities, while sharing in fewer of the benefits associated with these facilities.

Perhaps the most important procedural issue involves the mechanisms of public participation. The extent to which minorities are excluded from the environmental decision-making processes associated with siting hazardous or noxious facilities is critical to understanding the meaning of environmental justice (e.g., Bullard, 1993; Davis, 1992). A compelling case has been made that the environmental movement has historically excluded minority communities (Hays, 1987; Taylor, 1992). Moreover, the extent to which the processes of public policy have been underused by minorities reflects a kind of social isolation experienced by communities of color, isolation that may limit the extent and nature of participation in issues concerning the environment. This yields the following null hypothesis:

H4: Minority households are no less likely than nonminority households to participate in public policy processes.

Because minority communities are less likely to participate in typical political processes (e.g., voting, petition writing, and contacting political representatives), they are also less likely to get involved in environmental issues that require public participation. Minorities can be excluded from regulatory processes that require public participation because the form of participation is substantially different from the kinds of activities in which they usually participate.

The confidence in and access to government exhibited by minority communities is related to their extent of public participation. It has been argued that the government, big business, and science (particularly big science) have conspired (which may be slightly overstated) to place hazardous and noxious facilities in communities of color (Bullard, 1993). Consequently, it may be expected that minority communities have less faith in government. They are likely not only to trust the government less, but also to feel that their voice does not influence governmental actions. This leads to the following null hypotheses:

H5_a: Minority households are no less likely than nonminority households to trust the government.

H5_b: Minority households are no less likely than nonminority households to influence government actions.

If minority communities are less likely to have confidence in the government and feel constrained in influencing government actions, regulatory processes will have to create new mechanisms, or modify existing mechanisms, to ensure equitable access. Moreover, confidence in and access to government are issues of credibility that can take a long time to change. Public policy processes will have to overcome, if not actual structural constraints, the perception of such constraints in minority communities regarding the environmental regulatory process.

Equally important are the equity mechanisms that work behind the scenes, affecting the process indirectly. Because minorities and lower social economic

classes have fewer resources and alternatives, they are also more likely to be constrained by their current circumstances. Some communities have been selected for hazardous and noxious facilities because they need the jobs that would be provided to develop a sustainable economy (Bullard, 1992). Hence, because minority communities are less likely to be fully employed, they are more likely to accept hazardous and noxious facilities. Are minority households more likely than nonminority households to be unemployed or have lower household incomes? Do minority households have fewer viable housing alternatives, which creates barriers to their leaving a community when hazardous and noxious facilities are located in it? The following null hypotheses are yielded:

H6_a: Minority respondents are no less likely than nonminority households to be employed.

H6_b: Minority households have no less household income than do nonminority households.

H6_c: Minority households are no more likely than nonminority households to express constraints in the residential location choices.

At the most general level, rejecting these null hypotheses would indicate that minority households are constrained by the social structure such that they have more limited choices concerning environmental hazards than do nonminority households.

METHOD

Sample

The survey data reported herein represent four distinct race and ethnic populations in the State of Texas: Anglo Americans, Hispanic Americans, Afro Americans, and Asian Americans. The questionnaire was developed by the interdisciplinary research team; pilot tested; revised; and translated into Spanish, Vietnamese, Mandarin Chinese, and Korean. The Anglo, Afro, and Hispanic American surveys were conducted between October 29, 1993, and February 23, 1994; the Asian American survey was completed between December 22, 1993, and February 26, 1994. Four distinct sampling strategies were used to represent these race and ethnic groups.

First, a random sampling of 2,622 Texas household telephone numbers produced 799 completed questionnaires with 307 refusals and terminations combined, for a 72.2% cooperation rate (i.e., completes / [completes + refused]). A minimum of five calls were attempted for all numbers; busy numbers were attempted twice on the same shift, over five separate shifts of interviewers. Bad or disconnected numbers were attempted and then confirmed. Repeated attempts were made to complete virtually all refusals. This sampling technique produced all of the Anglo and Hispanic American samples and approximately half of the Afro American sample.

Second, an oversample of an additional 7,378 random numbers was screened to randomly select minority households. Of these, 666 were completed with

minorities, 2,315 Anglo-Americans were excluded, 190 known minorities refused to participate, and 198 people refused to be screened for potential inclusion. This resulted in a 63.2% cooperation rate after screening.

Third, nearly half of the Afro American sample was selected from phone numbers in areas with high (> 30%) concentrations of Afro Americans. This sample screened 4,759 numbers, with 1,350 being ineligible because they were not Afro American and 219 excluded because they were business or government telephones. As a result of this screening process, an additional 267 Afro Americans completed interviews, 52 Afro Americans refused to be interviewed, and 148 people refused to be screened for possible inclusion in the sample. This resulted in a 57.2% cooperation rate after screening. The samples resulting from the two processes (i.e., random oversampling and sampling from high-concentration areas) were compared with respect to their responses to the survey items; no response differences were found to be statistically significant.

Finally, because of the extremely low number of Asian Americans in the sample at this point, nearly all (89.8%) of the Asian Americans were selected from among phone numbers with Asian surnames. A total of 5,300 numbers were screened, with 1,605 excluded because the resident was not an Asian American; 108 numbers were excluded because they were businesses or government telephones. An additional 449 Asian Americans completed interviews, 244 Asian Americans refused to be interviewed, and 227 people refused without being screened for ethnic qualification. This resulted in a 48.8% cooperation rate after screening.

Over all race and ethnic groups, there were 2,181 completed interviews, with 1,366 refusals (including those who refused screening procedures). This resulted in a 61.5% cooperation rate. In all, there were 618 Anglo American, 550 Hispanic American, 513 Afro American, and 500 Asian American interviews completed. Like the Census, these samples indicate that Anglo and Asian Americans in Texas are of higher social class than Hispanic and Afro Americans in Texas. The Asian Americans were the most likely to have completed high school (93.8%) and reported the highest median and mean household incomes (\$42,400 and \$40,900, respectively). The Anglo Americans were the next most likely to have completed high school (86.4%) and reported the second highest median and mean household incomes (\$34,700 and \$36,600, respectively). The Hispanic Americans were the least likely to complete high school (66.5%) and reported the lowest median or mean household incomes (\$22,900 and \$27,100, respectively). The Afro Americans were also unlikely to complete high school (81.9%) and reported the next to lowest median and mean household incomes (\$25,000 and \$28,000, respectively). (All percentages are based on the total reference group sample, unless a specific reference group is indicated.)

Measurement

H1_a In order to test the hypothesis that minority households are no less likely than nonminority households to live in communities that are free of hazardous and noxious facilities, respondents were asked, "What facility presents the greatest risk to the health and welfare of people in your community?" Seven in 10 respondents indicated that there were no risky facilities in their community.

One in 10 reported a hazardous facility of some kind—garbage dump, chemical plant, refinery, manufacturing plant, power plant, nuclear weapons or nuclear power plant, or generalized pollution. Another 6% of the respondents in all groups referred to social institutions and problems such as halfway houses, pornography shops, and drug-related locations as presenting the greatest risk in their communities. These three categories of responses accounted for 87.0% of the responses to this item; other responses included transportation routes or stations such as railways, highways, or airports; salt mines; and miscellaneous places and facilities. Nearly one in 10 respondents were unable to answer, saying, "don't know."

H1_b In order to test the hypothesis that minority households are no more proximate than nonminority households to hazardous and noxious facilities, respondents who identified a risky facility were asked, "About how far from this facility do you live?" More than 9 in 10 respondents (93.6%) who were asked the question were able to estimate the distance to the riskiest facility. The average distance between the respondent's residence and the facility believed to be the riskiest in the community was 30.8 miles with a standard deviation of 51.1 miles. Nearly a third of the respondents (32.9%) report living within a mile, while two-thirds (66.3%) live within five miles, and five out of six respondents (83.6%) live within ten miles of the identified facility.

H2 To test the hypothesis that residential tenures among minority households are no more likely than those among nonminority households to precede facility tenures, residential tenure had to be compared with facility tenure. Residential tenure was assessed in terms of the response to the question, "How long have you lived in the same community?" Facility tenure was estimated by asking respondents who identified facilities, "When did this facility first locate in your community?" Residential and facility tenure were compared by subtracting facility tenure from residential tenure. According to respondents from all racial and ethnic groups, referenced facilities had been located in the communities more than a quarter of a century (28.8 years) on average. Meanwhile, respondents had lived in their communities only an average of 15.4 years. For the 498 respondents who answered both questions, the facilities preceded their establishing a residence in the community by 10.7 years, on average. Facility tenure exceeds residential tenure for nearly two thirds (64.7%) of the respondents, while residential tenure exceeds facility tenure for only a quarter (23.5%) of the respondents in all ethnic and racial groups.

H3_a Three questions were asked to test the hypothesis minority households are no more likely than nonminority households to bear the burden of risks associated with hazardous and noxious facilities. First, respondents who identified a risky facility were asked, "How likely is it that an accident at that facility will threaten the health or property of people in your community?" The responses to this question represented acute (accidental) risks. Second, respondents were asked, "How likely is it that routine activities, like pollution, at that

¹In all, 546 respondents reported the existence of a potentially hazardous facility in their area (Anglo American *N* = 190, Afro American *N* = 135, Asian American *N* = 73, and Hispanic American *N* = 148). These reduced samples were used to test hypotheses about specific facilities as indicated.

facility threaten the health of people in your community?" Responses to this item represented chronic (ongoing or routine) risks associated with living in their community. Responses to both the acute and chronic likelihood questions were made on a 5-point Likert scale with the response categories *very likely, likely, about a 50/50 chance, unlikely, and very unlikely*. These categories were arbitrarily assigned index values between 0 and 1, with 1 representing *very likely* and 0 representing *very unlikely*; .50 represented the 50/50 chance response, and *likely* and *unlikely* responses were assigned to the equidistant midpoints in the appropriate direction (.75 and .25, respectively). Both acute and chronic risks were assessed at just slightly above the 50/50 chance level (.532 and .566, respectively) on average across all ethnic and racial groups. Four items were used to assess the degree of acceptability associated with potentially hazardous facilities. Respondents were asked if they *strongly oppose, oppose, favor, or strongly favor* "Having potentially hazardous facilities in your community?"; "Offering tax incentives to attract companies operating potentially hazardous facilities?"; "Requiring continuous monitoring for releases from potentially hazardous facilities?"; and "Giving people living near potentially hazardous facilities reduced tax rates." Respondents were also asked, "Could you please describe the kinds of people who get the greatest benefits from the facilities?" Six out of seven respondents who were asked this question responded by indicating one of four categories: a generalized *other* (e.g., the whole country, customers, town citizens, and workers) (36.8%), *people with high incomes* (24.2%), *people with low incomes* (15.4%), or *an ethnic or racial minority* (9.9%).

H3_b In order to test the hypothesis that minority households are no less likely than nonminority households to receive the benefits associated with hazardous and noxious facilities, respondents who identified risky facilities were asked, "Could you please describe the kinds of people who are most likely to be injured or suffer illness because of facilities like those we have been discussing?" Two thirds of the respondents said that minorities (12.3%), people with low incomes (18.9%), people living nearby (16.3%), and the elderly (18.5%) were the most likely to suffer injury or illness as a result of the facility. Only 1.1% indicated that people with high incomes were the most likely to be injured or suffer illness because of the hazardous facilities.

H4 In order to test the hypothesis that minority households are no less likely than nonminority households to participate in public policy processes, all respondents were asked, "During the past twelve months, have you worked or cooperated with others to try to solve a problem affecting your city or neighborhood?" Nearly one third (30.6%) of the respondents reported having worked on community or neighborhood projects during the previous year. In addition, public participation was more broadly assessed in terms of six mechanisms: Respondents were asked whether they had "signed a petition," "contacted a public official by writing or phoning," "attended a public meeting," "contributed money or worked for a candidate or party," "attended a demonstration or rally," or "joined a political organization." Respondents reported having done an average of approximately one (.911) of the activities. That is, 49.6% reported having done none of the six activities, 25.0% reported having

participated in one of the activities, 14.3% reported have done two of the activities, and 11.1% reported having done three or more of the activities. Finally, people were asked, "Did you vote in the presidential election last November?" Nearly 6 in 10 people (58.7%) reported that they had voted in the most recent presidential election.

H5 The hypothesis that minority households are no less likely than nonminority households to trust the government was tested by asking respondents, "How much of the time do you think you can trust the local government to do what is right?" By coding *almost always* as 1 and *almost never* as 0, with *mostly* and *sometimes* coded as equidistant in the appropriate directions (.66 and .33, respectively), a 0 to 1 index was formed whereby 1 represented a very high degree of governmental trust and 0 represented a very low degree of trust in local government. The sample's overall average level of trust was just slightly above *sometimes*, at .384 ($SD = .249$). Hence, on average, people indicated that they trusted local government slightly more often than sometimes but not mostly.

The hypothesis that minority households are no less likely than nonminority households to influence government actions was examined by asking respondents whether they agreed or disagreed with the statement, "People like me don't have any say about what the government does." Nearly two fifths (59.8%) of those responding disagreed with the statement, indicating that they believed they had a voice in local government.

H6 In order to test the hypothesis that minority households are no less likely than nonminority households to be employed, respondents were asked, "Were you working full-time, part-time, going to school, keeping house, or what last week?" Two fifths (69.6%) of the respondents reported working full-time, and only 2.2% reported being unemployed.

In order to test the hypothesis that minority households have no less household income than nonminority households do, respondents were asked, "What is the total income you expect all members of your household to earn in 1993?" The mean household income among all ethnic and racial groups was reported to be about \$33,100 ($SD =$ approximately \$14,900), and the median income was \$33,200. This mean household income is about 8.1% below the mean household income documented in the 1989 Census, and the median household income is 22.8% above that documented in the 1989 Census (U.S. Bureau of the Census, 1990).

The hypothesis that minority households are no more likely than nonminority households to express being constrained in their residential location choices was tested by asking respondents, "What is the most important reason you live at your current address?" Four categories of responses accounted for almost nine tenths (89.3%) of the responses. Location of the residence (e.g., being close to work, school, shopping, or family) was cited by 38.0% and barriers to moving (e.g., cannot afford to move, too old to move, no where else to go, and inexpensive housing) by 20.9% of the overall sample. Familiarity with life in the area was cited by 20.8% of the overall sample. Environmental attractors, such as a low crime rate or environmental reasons, were cited by 9.6% of the overall sample.

FINDINGS

H1 Two thirds (66.8%) of the Anglo American respondents reported that there was no risky facility in their communities. There were no significant differences between Anglo and Afro Americans (68.2%); however, both Asian (76.0%) and Hispanic (72.5%) Americans were significantly less likely than Anglo and Afro Americans to identify risky facilities in their communities. Similarly, Afro (9.6%), Hispanic (9.5%), and Asian (8.0%) Americans were significantly less likely than Anglo Americans (13.9%) to report potential hazardous facilities. There were significant differences on these two dimensions among ethnic and racial groups, but they were not in the predicted directions. Only the intergroup differences associated with social facilities were both significant and in the predicted directions, with Anglo Americans (4.9%) being approximately half as likely as Hispanic Americans (7.3%) or Afro Americans (9.9%) to report social facilities as the riskiest facilities and Asian Americans (1.6%) reporting less than half the level of Anglo Americans. Overall, these results indicate that although the null hypothesis must be rejected, the conclusion that minority households are less likely than nonminority households to live in communities that are free of hazardous and noxious facilities cannot be defended, except for facilities that are more social than technological in nature.

Among the respondents who did identify hazardous facilities in their communities, only Afro Americans estimated the distances from their places of residence to those facilities as being significantly shorter than the distances estimated by Anglo Americans. No other minority group differed significantly from Anglo Americans in terms of the distance to the identified facilities. Anglo Americans reported that the identified facilities were an average of 8.5 miles away from their homes, whereas Afro Americans reported that the facilities were an average of 5.1 miles from their homes. Afro-Americans were consistently more likely than Anglo Americans to live within 1, 5, or 10 miles of the identified facility (44.9%, 78.7%, and 89.8%, respectively) vs. (26.1%, 62.0%, and 78.3%, respectively). No other significant differences were found concerning distance to the riskiest facility. These results indicate that, on average, Afro Americans lived closer to facilities that were recognized as hazardous than did other minorities and Anglo Americans. Hence, the null hypothesis that minority households are no more proximate to hazardous and noxious facilities than nonminority households was rejected for Afro Americans but not for Hispanic or Asian Americans.

H2 On average, Anglo Americans had lived 13.1 fewer years in their communities than the identified facilities had existed in them. Asian Americans (15.2 years) and Hispanic Americans (8.7 years) were not significantly different from Anglo Americans, reporting that risky facilities had been in their communities about a decade before they arrived. Afro Americans did differ significantly from Anglo Americans, reporting having arrived only 7.5 years after the identified facility. However, there were no significant differences among racial or ethnic groups in the proportion of respondents who reported that they had moved to their community before the identified facility had arrived. Hence, the null hypothesis that the differences between residential and facility tenures are similar for minority and nonminority households was rejected only for Afro Americans, compared to Anglo Americans. Moreover, on average, all ethnic and racial groups

reported that facilities were located in their community before they took up residence there.

H3 On average, Anglo Americans rated both acute (.450) and chronic (.499) risks as just a little less than a 50/50 chance, and Asian Americans rated these risks just slightly above a 50/50 chance (.500 and .542, respectively), but the difference was not significant. Both Hispanic (.536 and .594) and Afro (.661 and .639) Americans rated acute and chronic risks significantly higher than did Anglo Americans. This indicates that Afro and Hispanic Americans perceived greater risk from the facilities in their communities than Anglo and Asian Americans perceived from the facilities in their communities. This in turn indicates a greater degree of perceived burden among Afro and Hispanic Americans than among Anglo Americans. When it comes to compensation and the acceptability of potentially hazardous facilities, Asian and Anglo Americans were again similar, generally opposing either having or offering tax incentives to attract potentially hazardous facilities (.753 and .734, respectively), favoring continuous monitoring to ensure protection (.206), and remaining nearly neutral regarding reduced tax rates as compensation for nearby residents (.471). Compared with Anglo Americans, Afro Americans were significantly more likely to oppose having hazardous facilities in the community (.845) and offering tax incentives to companies to locate in their communities (.795) and to favor continuous monitoring (.289) and reducing taxes for nearby residents (.387) as conditions or incentives to accept hazardous facilities. Hispanic Americans were more opposed than Anglo Americans to having facilities in the community (.817) or requiring continuous monitoring, but their views were not significantly different from Anglo Americans' concerning offering tax incentives to attract such industry. Hispanics are significantly more likely to oppose continuous monitoring (.293) but are not significantly different from Anglo Americans when it comes to reducing taxes for people living in close proximity to potentially hazardous facilities.

There were five categories of responses concerning who was most likely to become ill or injured as a result of the hazardous facilities in communities. Nearly one in five (17.9%) Anglo Americans said low-income groups, whereas only 1.6% said high-income groups; 14.2% of Anglo Americans said people living nearby; another 15.3% said the elderly; and 16.3% said minorities were the most likely to become ill or be injured as a result of risky facilities in their community. None of the minority group responses were significantly different from those of Anglo Americans; and only responses concerning minorities, the elderly, and low-income people were nearly significant. Among Afro Americans, 9.6% stated that minorities were the most likely to be injured or to suffer illness as a result of the facility, whereas 27.4% said the elderly. Among Asian Americans, 8.2% indicated that minorities bear the burden of the risk of illness or injury, and among Hispanic Americans, 25.7% said minority groups.

Minority respondents thus perceived greater risk from hazardous facilities and found them generally less acceptable than did Anglo Americans. This is consistent with previous work that revealed a similar relationship between marginal social structural positions and risk perception (Rogers, 1983). Moreover, Afro, Asian, and Hispanic Americans were no more likely than Anglo Americans to believe that minorities bear more of the burden of risks associated

with hazardous and noxious facilities than nonminorities do. All groups were 1.5 times more likely to indicate that low-income people bear the burden (18.9%) than to indicate that minorities bear the burden (12.3%).

Facilities produce benefits (e.g., products, wages, and profits) along with potential hazards. Respondents (e.g., 36.8% of Anglo Americans) most frequently cited generalized others (e.g., workers, the whole country, or customers) as receiving the greatest benefits from potentially hazardous facilities. The category of people next most frequently cited as receiving the greatest benefit was people with high incomes (e.g., 22.7% of Hispanic Americans). The next most frequently cited category was people with low incomes (e.g., 16.8% of Anglo Americans), and the category the least frequently cited as receiving the greatest benefit was minorities. With the exception that only 5.9% of Afro Americans specified minorities as receiving the benefits whereas 14.2% of Anglo Americans said minorities get the benefits, there were no significant differences among racial and ethnic groups in terms of beliefs regarding who gets the benefits associated with potentially hazardous facilities. Only Afro Americans specified people with low incomes significantly less often than they specified minorities; in all other groups, there were no significant differences. Meanwhile, all race and ethnic groups were significantly more likely to say that generalized others would get the greatest benefit than to mention minorities in that regard. Hence, there was general agreement among the racial and ethnic groups that benefits are most likely to go to generalized others and to people with high incomes and less likely to go to people with low incomes and to minorities.

H4 Nearly two fifths (38.7%) of the Anglo Americans surveyed indicated that they had worked together with others to solve a community or neighborhood problem. Afro Americans were not significantly different from Anglo Americans. Hispanic Americans (29.3%) were nearly a third less likely than Anglo Americans and Asian Americans were less than half (17.4%) as likely as Anglo Americans to engage in community activities. Whereas more than three fourths (77.7%) of Anglo Americans reported voting, no more than two thirds of the rest of the minority groups had voted in the most recent presidential election, with 64.7% of Afro Americans, 51.8% of Hispanic Americans, and 36.6% of Asian Americans voting. On average, Anglo Americans reported having engaged in just over one (1.2) of six public participation activities, Asian Americans reported having engaged in .71 such activities, Hispanic Americans reported having participated in .79 such activities, and Afro Americans reported having participated in .90 such activities. Thus the null hypothesis that minority households are no less likely than nonminority households to participate in public policy processes was rejected. Minority groups were less likely to participate in these processes.

H5 Regarding the degree of trust and efficacy respondents felt toward the government, on average, Anglo and Afro Americans stated they felt they could "sometimes" trust local governments to do what is right (.350 and .328, respectively). Hispanic and Asian Americans expressed significantly higher levels of trust, between "sometimes" and "mostly" (.406 and .465, respectively) on average. Although there were significant differences in the amount of trust in local government expressed, they were not in the predicted direction. Hispanic and Asian American households were more likely to trust local government to

do what is right than were nonminority households, and Afro Americans were not significantly different from Anglo Americans. Moreover, there were no significant differences among the race or ethnic groups in terms of the degree of efficacy expressed. Approximately three fifths of all groups stated that people like them have no say about what the government does. Hence, the null hypothesis that minority households are no less likely than nonminority households to believe they can influence government actions was not rejected.

H6 The degree to which employment and income form barriers for minorities to change their place of residence requires that minority groups have significantly less employment or household income. Nearly 7 in 10 respondents in all groups reported being employed full-time; 65.3% of Anglo American respondents reported being fully employed, and no minority groups were significantly different. Hence, the null hypothesis that minority respondents are no less likely than nonminority households to be employed was not rejected. However, all minority groups differed significantly from Anglo Americans in terms of household income. Hispanic and Afro Americans estimated their total household income at levels 20–25% less than the Anglo Americans' estimates, whereas Asian Americans estimated their income levels at 7% greater than the Anglo Americans' estimates. When per capita household incomes were compared among ethnic groups, the pattern was emphasized among Hispanic Americans (i.e., dropping from about 25% to nearly 30% below that of Anglo Americans). Meanwhile, Afro American per capita household incomes remained at about 20% below Anglo American incomes. Asian and Anglo Americans reported per capita household incomes that were not significantly different from each other. Hence the null hypothesis that minority households have no less household income than nonminority households do was rejected for Afro and Hispanic Americans.

When asked to name the most important reason for living at their current address, the overall sample referred to proximity to schools, work, shopping, and family more often than any other category. One third (33.7%) of Anglo American respondents, nearly two thirds (62.4%) of Asian Americans, and approximately one third (34.0%) of Hispanic Americans cited location as the principle reason for their current residence; in contrast, only 23.4% of Afro Americans cited location as the most important reason for their current residence. Conversely, barriers to residential mobility—principally, but not exclusively, economic barriers—were cited about 30% more frequently by Afro Americans (28.8%) than Anglo Americans (21.8%). Asian Americans (11.2%) specified barriers about half as frequently as Anglo Americans, while the difference between Hispanic and Anglo Americans was not significant. Even though the difference was not significant at the .05 level, Hispanic Americans (25.7%) indicated cultural barriers, citing knowledge of the area and its people, more than 20% more often than did Anglo Americans (20.9%). Meanwhile, Asian Americans (13.2%) were 40% less likely to cite such knowledge than were Anglo Americans. Finally, about 1 in 10 respondents across all groups cited attractors such as lower crime rates or environmental reasons as the most important reasons for their residential choices. No significant differences among groups were found. Hence, the null hypothesis that minority households are no more likely than nonminority households to express being constrained in their

Table 1 Tests of null hypotheses by group

Hypothesis	Hispanic Americans	Afro Americans	Asian Americans
1 _a : p(risky facilities)A ≥ p(risky facilities)M	-	-	-
No facility	-	-	-
Hazardous facility	++	++	-
Social facility	++	++	-
1 _b : p(proximity)A ≥ p(proximity)M	+	++	++
Being less than 1 mile	+	++	++
Being less than 5 miles	+	++	++
Being less than 10 miles	+	++	++
Proximity in miles	+	++	++
2: p(residential tenure)A ≥ p(residential tenure)M	++	++	++
Residential-facility	++	++	++
Residential prior	++	++	++
3 _a : p(bear burden of risk)A ≤ p(bear burden of risk)M	++	++	+
Acute risk	++	++	+
Chronic risk	++	++	+
Minorities	+	+	+
Low-income people	+	+	+
High-income people	+	+	+
People living nearby	+	+	+
Elderly	+	+	+
Having facility	++	++	++
Company tax incentives	++	++	++
Continuous monitoring	++	++	++
Reduce neighbor's taxes	++	++	++
3 _b : p(receive benefits)A ≥ p(receive benefits)M	++	++	++
Minorities	++	++	++
Low-income people	++	++	++
High-income people	++	++	++
Generalized others	++	++	++
4: p(public participation)A ≥ p(public participation)M	++	++	++
Community participation	++	++	++
Voting	++	++	++
Public participation	++	++	++
5: p(confidence in government)A ≥ p(confidence in government)M	++	++	++
Trust in local government	++	++	++
Efficacy with government	++	++	++

Table 1 (Continued)

Hypothesis	Hispanic Americans	Afro Americans	Asian Americans
6: p(mobility barriers)A ≥ p(mobility barriers)M	++	++	-
Employed	++	++	-
Income	++	++	-
Per capita household income	++	++	-
Location	++	++	-
Barriers	++	++	-
Familiarity with area and people	+	+	-
Environmental attractors	+	+	-

Note. p = probability; A = Anglo Americans; M = minorities (Afro Americans, Asian Americans, and Hispanic Americans); blank cell represents failure to reject null hypothesis; ++ = rejection of null hypothesis at .05 level; + = rejection of null hypothesis at .10 level; - = rejection of null hypothesis, but results were not in predicted direction.

residential location choices was rejected for Afro Americans but not for Hispanic and Asian Americans.

CONCLUSION

The results of the hypotheses tests by hypothesis and minority group are summarized in Table 1. The null hypothesis that minority groups are no more likely than nonminorities to be exposed to risks was not rejected; however, Afro Americans were found, by every measure, to live in greater proximity to hazardous facilities than were Anglo Americans. The null hypothesis that the differences between residential and facility tenure are similar among minority and nonminority households could not be rejected for Hispanic and Asian Americans. Afro Americans were found to have significantly smaller differences between residential and facility tenure than did Anglo Americans. On average, all groups indicated that the potentially hazardous facilities had preceded their residency in the community. Minority households both rated the risks associated with the facilities in their communities at significantly higher levels than did Anglos and found the facilities less acceptable than did Anglos. Moreover, every minority group was significantly more likely than Anglo Americans to believe that minority groups bear the greatest burden, in terms of potential illness or injury, from these potentially hazardous facilities. Only Afro Americans found minorities significantly less likely to benefit from such facilities. General agreement among the racial and ethnic groups is that people are 3.7 times more likely to say that benefits associated with potentially hazardous facilities go to

generalized others and 2.4 times more likely to go to people with high incomes than to reach minorities. Moreover, the sample responded that people with low incomes are 1.6 times more likely than minorities to benefit from these facilities. All groups were more than 1.5 times more likely to respond that low-income groups are most likely to be injured or suffer illness as a result of hazardous facilities than to say that minorities are most likely to suffer.

The null hypotheses regarding voting and public participation were rejected for all groups, and Hispanic and Asian Americans were found to be less likely than Anglo Americans to participate in the community, but Afro Americans did not differ significantly from Anglo Americans in terms of community participation. However, the tests of the null hypotheses regarding public confidence in government were less convincing. Hispanic and Asian Americans were found to trust their local governments significantly more than Anglo Americans trusted theirs, and Afro Americans were not significantly different from Anglo Americans. Minority respondents were not found to differ significantly from Anglo respondents in terms of employment status, except that Asian Americans were more likely than Anglo Americans to be employed. Hispanic and Afro American households estimated their household incomes at lower levels than did Anglo Americans. Furthermore, Afro Americans were less likely to report that they had chosen their residence on the basis of location and were more likely to indicate economic barriers as the most important factor in their choice of residence. This indicates that Afro Americans are faced with fewer perceived response alternatives when potentially hazardous facilities locate in their area. Hispanic Americans did not differ significantly from Anglo Americans in their reasons for residential choice; however, they leaned toward cultural reasons associated with knowing the area and its people. Asian Americans, although significantly different from Anglo Americans, were in opposite direction (i.e., more likely to cite location, less likely to talk about barriers and knowing the area and its people, and more likely to talk about environmental factors than Anglo-Americans).

Overall, the evidence in support of the environmental racism hypotheses tested herein was weaker than anticipated. The strongest support for the direct-exposure hypotheses (i.e., location in the community and proximity) came only from Afro Americans. Although attitudes about risk reflected the theoretically anticipated pattern, many of the critical null hypotheses could not be rejected. The most robust support for the hypothesized relationships across all minority groups was provided by perceived and acceptable level of risk, public participation, and household income. The results confirm the most direct tests of environmental racism only for Afro Americans. Limited support was found for the notions that minorities suffer the greatest risk of injury or illness from hazardous facilities and benefit the least from them. All groups seemed to agree that whereas minorities generally suffer greater consequences, generalized others are most likely to benefit. This study calls for greater study of environmental justice issues at the household level, with greater attention paid to the objective and subjective measures of environmental injustice.

This chapter has artificially distinguished between environmental racism and social inequity in an effort to better understand the causes of the collocation of

potentially hazardous facilities and minority communities. Unfortunately, the conclusions are not robust enough to distinguish clearly environmental racism and inequity. Moreover, these data cannot be used to distinguish racism in society at large from environmental racism. In reality, environmental inequity is a function of both social class and racism at some level; however, the extent to which inequity is racism and racism is environmental depends on the exact criteria employed. For example, if a minority family chooses to live in an area with a potentially hazardous facility because it is convenient and affordable, few would refer to this as racism, but many would speak of the inequity, and nearly all would recognize the environmental consequences of the inequity. However, if the same residential choice were made on the basis of affordability alone (i.e., it was the only area the family could afford) and the primary wage earner (or any wage earner in the household) was experiencing racism in the workplace, most would agree this is racism, and many would agree that it has environmental consequences. Note that without the racism in social institutions (e.g., educational and occupational), this situation would also be inequity with environmental consequences. Finally, facility owners' targeting certain areas for facilities solely because the land is cheap leans toward environmental inequity, while targeting minorities for any reason (e.g., they will not, cannot, or are less likely to resist) is clearly environmental racism. There is often a complex mixture of both inequity and racism, which may simply have environmental consequences or in which the environment may be used as an instrument of either.

Because inequity is implied by social status (i.e., some people have more than others), society should not be expected to eliminate it. But racism is reprehensible, and society should strive to eliminate it; the nature of the instrument (e.g., environment, social practice, or institution) of racism is of little importance; racism is simply and completely wrong! The distinction only becomes important in the context of policy making. That is, a policy can eliminate racism most effectively when the firms it takes are understood. Without this understanding, policies tend to be hollow and less effective. Moreover, regulating equity (focusing on the result) is likely to be less effective than addressing the root causes of racism (addressing the process). Because racism implies motivation, the most effect way to eliminate racism would be to alter the motivation for it. One way to do this in the environmental arena is to levy fines, penalties, and judgments that make it too expensive for firms to engage in environmental racism. Fines, penalties, and judgments are one way to incorporate so-called external costs into the price of the products produced; other ways to incorporate the hidden environmental and social costs should be examined. Another way is to make individuals personally responsible and liable for their acts as decision makers in a firm, rather than focusing on the institutional responsibility of the firms alone. If individuals are responsible for their corporate acts, they are much more sensitive to the needs and concerns of all the people affected by their decisions. Finally, ensure that all people involved in environmental situations are given an equal opportunity to influence the process and the subsequent outcomes. This requires more than simply letting people be heard; it requires a meaningful dialogue that may alter the outcome.

