

# ETHNIC VARIATION IN ENVIRONMENTAL BELIEF AND BEHAVIOR: An Examination of the New Ecological Paradigm in a Social Psychological Context

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**ABSTRACT:** We use national-level data to test a modified version of Stern, Dietz, & Guagnano's causal model of environmental belief and behavior. We focus mainly on ethnic variation in environmental belief, as measured by the New Ecological Paradigm (NEP), and ethnic variation for four environmental behaviors: environmental reading, household recycling, environmental group joining, and participation in nature-based outdoor recreation. Blacks and foreign-born Latinos were less likely than Whites to score higher on the NEP. Any behavioral differences between Whites and the respective minority groups were expected to diminish with the inclusion of the NEP as an intervening variable in the model between ethnicity and behavior. However, ethnic differences remained stable and strong even when environmental belief

was added. Overall, Asian American and U.S.-born Latino environmentalism was most similar to Whites. African American concern and behavior was least similar to White environmentalism. Gender, age, and liberal political orientation were also consistent explicators for both environmental concern and behavior.

**Keywords:** *environmentalism; ethnicity; New Ecological Paradigm*

**This article examines** the convergence of ethnic diversity and environmentalism in the United States. We address environmental belief and behavior for five ethnic groups: African Americans, U.S.-born Latinos, foreign-born Latinos, Asian Americans, and European Americans.<sup>1</sup> We respond to Stern, Dietz, & Guagnano (1995) and Dietz, Stern, & Guagnano (1998) concerning relationships between social structural factors, environmental beliefs, and environmental behavior. Stern et al. (1995) and Dietz et al. (1998) argued that the environmental values literature, although containing important information on environmental trends and public opinions, lacks a social, psychologically derived theory base relating environmental values to social structure, environmental beliefs and attitudes, and behavior. The authors proposed an environmental concern model in which generalized environmental beliefs or worldview is positioned within a causal relationship where social structural variables are a precursor of such beliefs. In turn, beliefs and attitudes about the environment are predictors of environmental behavior.

We expand on Stern et al. (1995) and Dietz et al. (1998) by focusing on ethnic variation in the model. Stern et al. (1995) stressed the importance of structural factors such as ethnicity in influencing environmental perception and behavior, but they did not include an ethnic indicator in their analysis; Dietz et al. presented only a limited discussion and analysis of ethnicity by examining only Blacks and Whites. Along with Dietz et al.'s study, ours is one of a limited number of studies that examines causal relationships between structural, perceptual, and behavioral variables using national-level environmental data. Following Dietz et al.'s (1998) recommendation, we employ the New Ecological Paradigm (NEP), which Dietz et al. (1998) believed to be a better indicator of environmental belief than the environmental questions used in their analyses.

## CAUSAL MODEL OF ENVIRONMENTAL BELIEF AND BEHAVIOR

Figure 1 shows the Stern et al. (1995) and Dietz et al. (1998) model. The causal model contains four basic parts: (a) social structural variables, (b)

unspecified life values, (c) both generalized and specific environmental beliefs, and (d) environmental behavior. The first level contains those social structural factors that are largely inflexible, for example, ethnicity, age, and gender. Next, are general life values that undergird one's life such as ideas about God, child rearing, or the government. The third level includes environmental worldview or general beliefs and values concerning the environment. This level precedes more specific environmental perception such as attitudes about energy conservation or protection of wildlife habitats. The fourth level is behavioral commitment and intention preceded by actual behavior.

Central to the model is environmental worldview operationalized by the NEP (Dunlap & Van Liere, 1978; Dunlap, Van Liere, Mertig, Catton, & Howell, 1992; Dunlap, Van Liere, Mertig, & Jones, 2000). Stern et al. (1995) argued that the NEP measures a *folk ecology* or lay person's view of relationships in the natural world. It has been argued that the modern environmental movement, which gained momentum in the late 1960s (Inglehart, 1990), ushered in an era of fundamental attitude shifts with respect to nature (hence the descriptor paradigm), and the NEP is thought to measure generalized beliefs about the biophysical environment and the human relationship to it. The NEP challenges the Dominant Social Paradigm, which Dunlap & Van Liere (1978) maintained pervaded Western societies until the 1960s with its anthropomorphic emphasis on nature domination and resource extraction (Taylor, 2000; see also Pirages & Ehrlich, 1974).

#### MODIFIED CAUSAL MODEL

We operationalize a simpler version of the Stern et al. (1995) model—one which does not include general life values, specific environmental beliefs/attitudes, or behavioral intentions (Figure 2).<sup>2</sup> This model is tested for ethnic variation in beliefs and behavior. We propose a causal model in which ethnicity operates on environmental behavior primarily through environmental worldview. Model interpretation flows from top to bottom where one's position in the social structure is expected to affect his or her general beliefs about nature. Generalized beliefs are then predicted to have a direct causal effect on environmental behavior.

If the NEP does measure a folk ecology, the question for the present study is whether this ecology is consistent among ethnic groups. It would be presumptuous to assert that one folk ecology holds true for different ethnic groupings even in the United States where subcultural contrasts among ethnic groups have not been extreme (Alba, 1995; Wolf, 1998). This is an

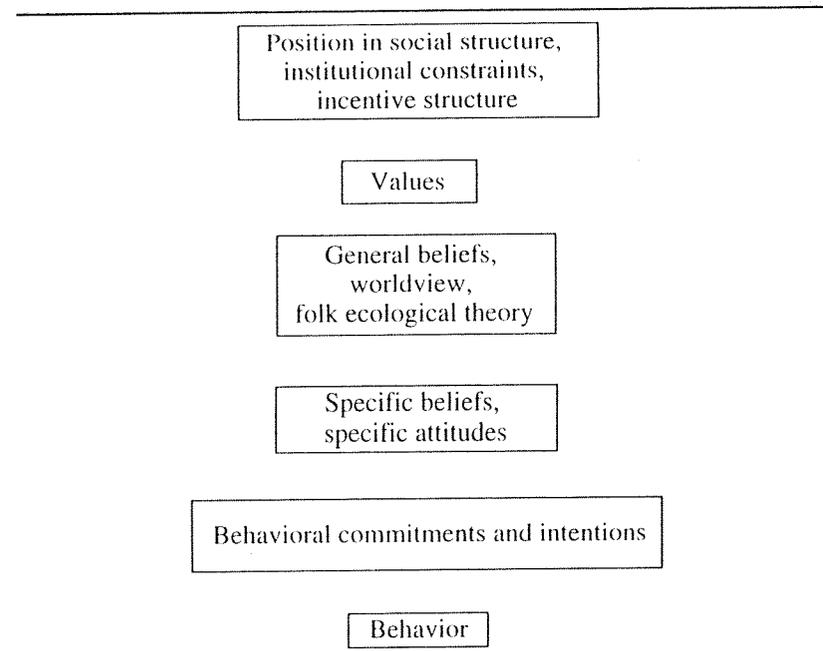


Figure 1: A Schematic Causal Model of Environmental Belief and Behavior

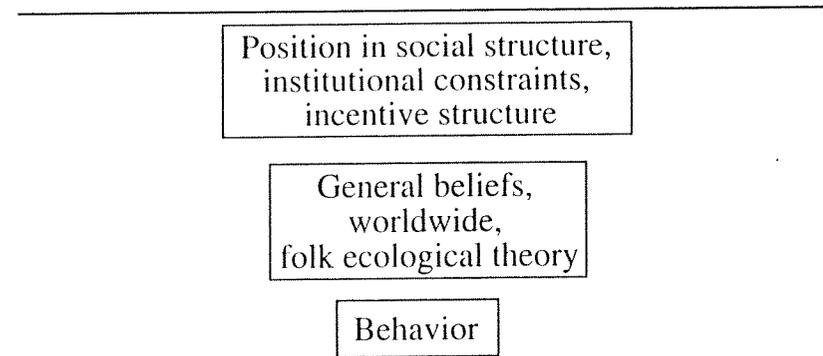


Figure 2: Revised Causal Model of Environmental Belief and Behavior

important consideration given the increasing ethnic diversity in this country and the possibility of divergent environmental worldviews held by various publics (Bechtel, 1999; Parker & McDonough, 1999). Recent figures released by the U.S. Census Bureau indicate that Latinos have surpassed

Blacks as the largest racial/ethnic group in the country (U.S. Census Bureau Public Information Office, 2001). Numerous studies have documented the demographic, economic, cultural, and social impacts of immigration to the United States since 1970 (Castles & Miller, 1998; Cordell & Overdevest, 2001; National Research Council, 1997). The majority of these more recent immigrants come from Asia and Latin America,<sup>3</sup> where the romantic/preservationist and human-nature dichotomy are not a part of these respective cultures's nature myths (Simcox, 1993).

### ETHNIC VARIATION IN ENVIRONMENTAL BELIEF AND BEHAVIOR

In the United States, assimilation theories predicting the eventual demise of ethnic loyalties and remembrances have been replaced largely with theories that privilege ethnic identification, albeit in more loosely defined, postmodern terms (Alba, 1990; Nagel, 1986; Waters, 1990).<sup>4</sup> With the emphasis in the United States and other Western countries on multiculturalism and the resulting reification of ethnicity and emergence even of new ethnic identities (Conzen, Gerber, Morawska, Pozzetta, & Vecoli, 1992; Nagel, 1994), we believe it important to examine the environmental views and behavior held by various ethnic segments of the population. As Macnaghten and Urry (1998) argued, people respond to or interact with nature based on

specific social practices, especially of people's dwellings, which produce, reproduce and transform different natures and different values. It is through such practices that people respond, cognitively, aesthetically and hermeneutically, to what have been constructed as the signs and characteristics of nature. (p. 2)

The extent to which the social practices of ethnic minorities differ from those of the majority culture may be the degree to which variations in environmental beliefs and behavior are evidenced in society.

The environmental and outdoor recreation literature is inconclusive with respect to Black environmental beliefs/attitudes and behavior. Empirical studies conducted in the 1960s and 1970s indicate that Blacks were less environmentally concerned or attuned to the natural environment than Whites (Hauser, 1962; Hershey & Hill, 1978; Meeker, 1973; Mueller, Gurin, & Wood, 1962; Washburne, 1978), but more recent work by Caron (1990), Jones (1998), Mohai and Bryant (1998), and Parker and McDonough (1999)

suggests the need to distinguish between environmental concern and behavior for Blacks. The latter studies report few Black/White differences in perception but do indicate differences in environmental behavior.

Although the various social and economic dimensions of ethnic migration and immigration are well documented, there is much less scholarship on the differential environmental beliefs and behavior of immigrating groups. Concerning Latino American environmentalism, Lynch (1993) proposed that people of Latin American descent in the United States hold a different perspective of the natural world compared to Whites. In contrast to the middle-American view of nature as separated from the individual and community, Latinos perceive humans to be intimately connected with their natural surroundings.

Empirical analyses of Latino environmentalism and interaction with nature also show mixed results in terms of conformity with White perceptions and interactions with the environment. Generally, Latino outdoor recreation has been found to be more like that of Whites than other minority groups (Dwyer, 1994; Gramann, 1996, p. 28). However, others argue that the degree of *Anglo-conformity* among Latino groups with respect to environmental perception and behavior depends on the level of Latino acculturation to White, middle-class values (Carr & Williams, 1993; Floyd & Gramann, 1993; Floyd & Noe, 1993; Pizzini, Latoni, & Rodríguez, 1993; Shaull & Gramann, 1998).

Asian influences on American popular culture and the built environment have been noted (Barker, 2001). Again, however, less information is available concerning the impact of the various Asian cultures on the natural environment in the United States or how Asians view the environment; although several issues would suggest that Asian cultural influences on the environment are being evidenced. For instance, the growing popularity of Chinese herbal medicine may be a factor in the near depletion of wild ginseng from national forests in the South over the past 10 years (Chamberlain, Bush, & Hammett, 1998; Wayne Owen, personal communication, 2001).

According to Altman & Chemers, (1980, pp. 15-24), traditional Eastern cultures (Asian, African) and Native American groups believe that humans exist in a harmonious relationship with nature. Central to this holistic philosophy (Goodman, 1980; Pierce, Lovrich, & Tsurutani, 1987) is that

all things in nature are sacred and are not to be unduly exploited by people. . . . People are not the center of a natural universe that revolves around them, but

that people are part of nature and must blend with it and be responsible for it. (Altman & Chemers, 1980, p. 21)

This nature orientation contrasts most sharply with the Western view of humans as domineering of nature—a pervasive ontology in Judeo-Christian religion and scientific rationalism (Schultz, Zelezny, & Dalrymple, 2000).

If there is a distinct environmental orientation held by groups from non-Western societies, we also cannot ignore the potentially mediating effects of Western culture on contemporary non-Western societies—for instance, colonialism, including Judeo-Christian religion, industrialism, scientific rationalism, and a popular culture based on consumerism. East Asian immigrants, for instance, may not hold the traditional Taoist views of humans in harmony with nature but adhere more to a nonecological progressivism based on materialistic values, consumption, and competition (Sodowsky, Maguire, Johnson, Ngumba, & Kohles, 1994). In discussing the proliferation of competition and wealth in industrialized nations (and their deleterious environmental effects), Schnaiberg & Gould (1994, p. 49) noted, “Paradoxically, the Buddhist countries of Asia are adding to the number of new entrepreneurs in the modern world, Japan and Korea being the most active participants.” Guha (1989) also argued that the human/nature holism attributed to the East is more of a Western construction than an *oriental* reality. Environmental degradation caused by human influences have occurred both in Eastern and Western cultures.

What this means for us is that we have little understanding of how Asian environmentalism translates or manifests in the American context. Specifically, the extent to which historical forces, both secular and sacred, influence how Asian Americans perceive their relationship and responsibility toward the environment is not known.

In considering ethnic variations in environmentalism, we are aware that there may be a considerable amount of diversity of environmental belief and behavior within any given ethnic categorization (Altman & Chemers, 1980; Carr & Williams, 1992a, 1992b; Floyd & Noe, 1993; Shaull & Gramann, 1998; Simcox, 1993).<sup>5</sup> Also, the pro- versus antienvironmental dualism is merely an analytical concept to serve as a general guide, and the orientations should not be viewed as orthogonal but relative in any given culture.

The literature provides no clear indication of how ethnic minority groups might respond to environmental measures included in this study. Past research shows that, in some cases, minority environmentalism is stronger than White behavior or concern (Jones, 1998), whereas, in other cases, some

minorities appear less environmentally engaged (Zube & Pitt, 1981). Because of the inconclusiveness in the literature, we do not predict which ethnic minorities will report more proenvironmental beliefs compared to Whites, but we assume the effect of ethnicity on behavior—being Asian, for instance—is mediated through environmental belief (Figure 2). If there is a positive relationship between a given ethnic group and environmental belief, we would expect more frequent environmental behavior by that group because of the positive relationship assumed between environmental belief and behavior. That is, higher scores of environmental belief should correspond to higher scores of the environmental behavior measures. Also, if there are initial ethnic differences in environmental behavior, we expect them to be mediated or reduced by the introduction of environmental belief (NEP).

## OTHER VARIABLES IN THE MODEL

### SOCIAL STRUCTURAL VARIABLES

In addition to ethnicity, the model also includes gender, age, education, residence, family size, and political ideology among the social structural variables. Education, age, residence, and political ideology have been shown to be consistent predictors of environmental concern or belief, but they typically account for 10% or less of the variation in statistical analyses (Jones & Dunlap, 1992; Tarrant & Cordell, 1997; Wall, 1995a). Respondents with a college education, younger persons, those living in an urban environment, and individuals with a more liberal political orientation or ideologies have been shown to be more environmentally concerned than others (Olli, Grendstad, & Wollebaek, 2001; Wall, 1995a). Correlates of environmental behavior are less clear than those associated with environmental perception, although the effects of gender, education, age, and income are typically examined (Olli et al., 2001).

### BEHAVIORAL VARIABLES

Finally, our causal model includes four indicators of environmental behavior: environmental reading, household recycling, participation in environmental or conservation groups, and participation in nature-based outdoor recreation activities.<sup>6</sup> Recycling and participation in environmental groups

have been examined by a number of researchers (Derksen & Gartrell, 1993; Dietz et al. 1998; Parker & McDonough, 1999). A precedent for considering nature-based outdoor recreation as a measure of environmental behavior was established by Dunlap & Heffernan (1975) and by Theodori, Luloff, and Willits (1998) who examined the relationship between environmental concern and outdoor recreation activities. The former study found a stronger correlation between participation in appreciative activities such as camping, hiking, and park visitation and environmental concern than between more consumptive activities such as fishing and hunting.

## METHOD

### DATA COLLECTION

Data are from the 2000 National Survey on Recreation and the Environment (NSRE). The NSRE is the eighth in the continuing series of U.S. National Recreation Surveys that began in the 1960s. The current survey started in 2000 and is scheduled to continue through 2003 (Cordell, Green, & Betz, 2002). The NSRE is a random-digit-dialing telephone survey of more than 50,000 households nationally. The sample was obtained from a listing of working-block telephone exchanges supplied by Survey Sampling, Inc. (SSI). A block consists of a set of 100 contiguous numbers identified by the first two digits of the last four numbers (e.g., in the number 231-5200, 52 is the block). Selected numbers are entered into a computer-aided telephone interviewing system (CATI), and potential respondents are chosen from these numbers.

The survey gathers information on a number of outdoor recreation and environmental topics including outdoor recreation participation, environmental attitudes, natural resource values, attitudes toward natural resource management policies, household structure, lifestyles, and demographics. The data are weighted using poststratification procedures to adjust for disproportionate age, race, gender, education, and rural/urban strata (Cordell et al., 2002).

To date, there are 11 versions of the NSRE. We report data from versions 2 and 4 of the survey, as only these versions contain modules with data necessary for the present analysis. Both these versions include questions on the kinds and frequency of outdoor recreation activities, environmental attitude

questions, lifestyle indicators (including environmental behavior, child rearing, and home computer use), and demographic questions. The total sample size for version 2 is 5,058 and 5,004 for version 4. American Indians and Alaska Natives ( $n = 139$ ) were omitted from the combined sample reducing it to 9,923. In both versions 2 and 4, the NEP questions were administered to only 2,500 respondents. The sample was further reduced by the omission of observations with missing data for any variable used in the analysis. The sample size used for analysis was 3,513. Of these, 2,995 were White, 248 Black, 169 U.S.-born Latino, 44 foreign-born Latino,<sup>7</sup> and 57 Asian.

## OPERATIONALIZING THE CAUSAL MODEL

### SOCIAL STRUCTURAL VARIABLES

The Black, U.S.-born Latino, foreign-born Latino, Asian, White, gender, education, and liberal variables are dichotomous. Ethnicity is coded 1 for Blacks, 1 for U.S.-born Latinos, 1 for foreign-born Latinos, and 1 for Asians. White is the base group. For gender, females are coded 1. Respondents with postsecondary-level education are coded 1 and all others 0. Urban is coded 1 for residence in a metropolitan county as defined by the U.S. Census, and residence in nonmetropolitan counties is coded 0. Age is measured in number of years. Family size is the total number of family members residing in the household.

The liberal variable measures political ideology. This variable was constructed from a question in the environmental module that asked respondents which of five political issues were of most concern to them. These included (a) reducing the public debt, (b) reducing crime, (c) saving social security, (d) protecting and improving the natural environment, and (e) reforming the health system. Respondents who selected either protecting and improving the natural environment or reforming the health system were coded as liberal ( $Y = 1$ ). All other responses were coded 0 (not liberal).

### ENVIRONMENTAL BELIEFS

As discussed, the NEP Scale measures generalized environmental belief. Each item comprising the NEP Scale was measured with a five-point Likert-type scale ranging from *strongly agree* (1) to *strongly disagree* (5) including a *neither agree nor disagree* (3) category. "Don't know" and "Refused" response categories were also included but were omitted from analysis.

“Don’t know” and “Refused” responses ranged from 1.41 to 7.35% for the respective scale items.<sup>8</sup> All items were scaled so that a score of 5 would represent the most proenvironmental stance. We performed an exploratory factor analysis on 10 items in the NEP Scale to assess the underlying factor structure. The NSRE included only 10 items rather than the full 15 NEP statements because of time and space limitations. Also, only two items per factor, rather than three, were included for three of the underlying factors specified by Dunlap et al. (2000): Antianthropocentrism, Balance of Nature, and Rejection of Human Exemptionalism. The original three items were included for the Ecological Crisis dimension and one item for Limits to Growth.

Similar to Dunlap et al. (1992), our analysis did not show clear distinctions between the five factors. However, two factors were specified based on a scree test of eigenvalues. This may be because of the reduced number of scale items. Questions relating to impending Ecological Crisis and Balance of Nature loaded on the first factor, and Human Exemptionalism and Antianthropocentrism loaded on factor two. An item intended to tap the Limits to Growth dimension also loaded on the first factor, and an item thought to measure Ecological Crisis loaded more heavily on factor two (Table 1). We assessed internal consistency with Cronbach’s alpha, which was .70. To use the NEP variable in the analyses, we constructed a mean NEP score based on all 10 items.

#### ENVIRONMENTAL BEHAVIOR

Environmental behavior was operationalized with three questions from the lifestyle indicators module and a composite measure of recreational involvement with nature. The behaviors were also measured on a Likert-type scale with values ranging from one to three. To introduce these questions, interviewers read the opener: “Next, I would like to read a list of activities and interests that describe people’s lifestyles. Please tell me if this is an activity that you do frequently, sometimes, or never as part of your lifestyle.” These questions were also scaled so that a score of 3 indicated most frequent participation. The first question pertained to how often the respondent read nature or environmental magazines; the second asked about frequency of household recycling of glass, paper, plastics, or other material; and the third concerned frequency of participation in environmental or conservation groups.

We also created an indicator variable, nature participation, based on participation in outdoor recreation activities. If a respondent reported participation in the past year in either backpacking, hiking, primitive camping, fish viewing, gardening, viewing/photographing flora, viewing/photographing birds or fish, or viewing/photographing wildlife other than birds or fish, the

TABLE 1  
Factor Pattern and Structure for New Ecological Paradigm Items (N = 3,513)

Scale Item	Factor Pattern		Factor Structure	
	A <sup>a</sup>	B <sup>b</sup>	A <sup>a</sup>	B <sup>b</sup>
Human skill and resources will ensure that we do not make the earth unlivable.	-.06	.35	.02	.34
Humans are severely abusing the environment.	.58	.07	.60	.20
Humans have the right to modify the environment to suit their needs.	.06	.51	.17	.52
Humans were meant to rule over nature.	.08	.44	.18	.46
Humans will eventually learn enough about how nature works to be able to control it.	-.19	.51	-.08	.47
If things continue on their present course, we will soon experience an ecological catastrophe.	.69	-.04	.68	.12
The balance of nature is delicate and easily upset.	.55	-.004	.55	.12
The environmental crisis has been greatly exaggerated.	.21	.40	.30	.45
We are approaching the limits the earth can support.	.51	-.09	.49	.03
When humans interfere with nature, it often produces disastrous consequences.	.57	.04	.58	.17

a. Ecological Crisis and Balance of Nature factors.

b. Human Exemptionalism and Antianthropocentrism factors.

respondent was assigned a score of 1 for nature participation. Otherwise, the respondent was assigned a 0. A test of colinearity between the independent variables was done by examining Spearman’s correlation coefficients. No significant colinearity was indicated.

#### ANALYSES

##### NEP

Before examining the combined effects of the NEP and the behavioral variables in the causal model, we first looked at ethnic variation for the NEP alone. This was done with ordered logit regression (Green, 2000, pp. 875-880). As the name implies, the ordered logit accounts for discreet, ordinal

response variables that take the form,  $Y = 1, 2, \text{ or } 3$ , for example. For the NEP,  $Y$  assumes values ranging from 1 to 5. The probability of a respondent scoring 1 through 5 on the NEP Scale was a function of ethnic group (White, Black, U.S.-born Latino, foreign-born Latino, Asian), gender, age, education, family size, urban residence, and political orientation.

The ordered logistic regression allows testing for ethnic differences in environmental belief (NEP) while holding the other social structural variables constant (Table 2). Mean NEP scores for the five ethnic groups are in the upper portion of Table 2. Regression results show that when holding constant gender, age, education, residence, family size, and political leaning, Blacks and foreign-born Latinos had significantly lower scores on the NEP than Whites. Also, older respondents and those with larger family sizes scored lower on the NEP. Women scored significantly higher or showed more environmental favor than men, and respondents who may be classified as liberal were more environmentally concerned.

The probability of scoring 4 or higher on the dependent variable, that is, having a relatively favorable view of the environment, would be .71 for an urban, U.S.-born Latino female, age 35, with a college education, four family members, and a liberal political orientation. The probability of a foreign-born, Latino female with the same characteristics scoring 4 or higher would be .54, .66 for a Black female, .74 for an Asian female, and .71 for a White female. For this question, foreign-born Latino females are clearly distinguished from other females.

#### CAUSAL MODEL

We next tested the two-equation, causal model to assess the influence of the NEP on each of the four environmental behaviors. Four separate causal models were analyzed. The models for environmental reading, recycling, and joining environmental/conservation groups were also examined with ordered logit regressions, because the responses for each of these variables range from 1 to 3. To determine whether ethnicity has a stronger direct or indirect effect (mediated through the NEP) on the respective behaviors, we followed a procedure specified by McClendon (1994, pp. 291-299) and Alwin and Hauser (1975).<sup>9</sup> The procedure assesses the total, direct, and indirect effects of ethnicity. As discussed, we propose a model of environmental behavior that includes ethnicity and other social structural variables along with variables measuring general environmental beliefs and behavior. Our model proposes that ethnic affiliation operates on environmental behavior primarily via the beliefs held by individuals; that is, the total ethnic effect on a given behavior should be primarily indirect rather than direct. Individuals of

**TABLE 2**  
Ordered Logistic Regression Estimates:  
New Ecological Paradigm (NEP) ( $N = 3,513$ )

<i>Mean</i>	<i>NEP</i>	<i>Standard Deviation</i>
Sample	3.65	0.73
Black	3.61	0.96
U.S.-born Latino	3.67	0.86
Foreign-born Latino	3.31	1.00
Asian	3.74	0.94
White	3.68	0.69

<i>Parameter</i>	<i>MLE coefficient</i>
Intercept 4	6.65****
Intercept 3	3.40****
Intercept 2	0.80****
Intercept	-1.90****
Black	-0.27***
U.S.-born Latino	-0.02
Foreign-born Latino	-0.76****
Asian	0.09
Gender	0.31****
Age	-0.01****
Education	-0.05
Urban	0.05
Family size	-0.12****
Liberal	0.64****
Model chi-square	199.78
Significance level	< .0001
% correct predictions	61.8

NOTE: MLE = maximum likelihood estimate.

\*\*\* $p \leq .001$ . \*\*\*\* $p \leq .0001$ .

different ethnicity who have similar scores on the NEP should report similar levels of involvement in environmental behavior.

The total, direct, and indirect ethnic effects on behavior were examined with a series of reduced-form, ordered logit equations. As suggested by McClendon (1994, pp. 291-294) and Alwin and Hauser (1975), equations are specified for each endogenous variable in a causal model commencing with a model that includes only exogenous—in our case, structural—variables. These models are then followed by those that include mediating variables until all relationships in the model have been accounted for. The total effect of a variable is its coefficient in an equation in which it first appears. A variable's total effect does not include the effects of intervening or

mediating variables. The direct effect of a variable is obtained when intervening variables are accounted for in subsequent models. The indirect effect is then derived by subtracting the direct from the total effect.

The probability of a respondent's self-assessed degree of involvement in environmental reading, recycling, or joining environmental groups, that is,  $Y = 1, 2, \text{ or } 3$  (never, sometimes, or frequently) was specified as a function of ethnicity, gender, age, education level, family size, residence, political orientation, and the NEP.

*Environmental reading.* Results from the total-effects, reduced form of the environmental reading model are shown in column 1 of Table 3. Blacks and females were significantly less likely than their counterparts to engage in more frequent reading of environmental or conservation literature. Older respondents were significantly more likely than younger ones to read more often. Those with postsecondary education and liberal political leanings were also more likely to engage in more frequent reading, and urbanites were less likely than rural dwellers to read more.

The probability associated with a particular response, for example, frequent reading of environmental and conservation literature ( $Y = 3$ ) for a rural, White female, age 50, with an education level of high school or less, two family members, and a nonliberal political stance would be .23. The probability is also .23 for a U.S.-born Latina, a foreign-born Latina, and an Asian American female with similar demographic characteristics. The probability lowers to .17 for a Black female. Comparing across genders, the probability of frequent reading for a Black male with the above characteristics would be .22—virtually the same as for all female groups except Black women.

Table 3 also presents results from the direct-effects, full model where the NEP is included in the analyses. Black, gender, age, education, urban, and liberal variables remain significant when the NEP is added to the model. The total effect of being Black on reading is  $-0.43$ , and the direct effect is  $-0.42$ . The indirect effect is  $-0.01$ . Only about 2% of being Black is accounted for by the NEP or environmental perception. As expected, the coefficients for the total, direct, and indirect effects are negative.

To assess the substantive effect of the NEP on a respondent's likelihood of frequent reading given different scores on the NEP, consider a rural-dwelling, Black male, age 30, with an education beyond high school, five family members, who is politically liberal, and who has an NEP score of 5. The probability of frequent reading for this respondent is .53. The probability declines to .24 for the same respondent with a score of 2 on the NEP. Thus, the higher the NEP score, the higher the probability of more frequent engagement in environmental reading with all other factors equal.

The chi-square residual and Akaike Information Criterion (AIC) compare the fit of the total- and direct-effects models (Table 3) (SAS Institute, 1990). According to Stern et al. (1995) and Dietz et al. (1998), the direct-effects model, which includes the NEP, should provide a superior fit over the model that does not include environmental belief. Chi-square values for both total and direct-effects models were significant at  $p \leq .0001$ . However, the higher chi-square value for the direct-effects model suggests that it may provide a better fit than the total-effects model (SAS Institute, 1990).

*Recycling.* The total-effects analysis for recycling shows that Blacks and foreign-born Latinos were significantly less likely than Whites to recycle (Table 4). Women, older persons, those with postsecondary education, urban dwellers, larger families, and liberals were significantly more likely than others to recycle. The probability of frequent recycling for a Black male, age 25, with an education beyond high school, one family member, living in an urban environment with nonliberal views on the environment and health care is .36. For a White male with the same demographic characteristics, the probability increases to .57; for a U.S.-born Latino male, .55; for a foreign-born Latino male, .25; and for an Asian male, .60. White males with these characteristics are about 1.58 times more likely than Black males with similar demographics to recycle frequently; White males are roughly 2.28 times more likely than foreign-born Latino males to recycle more often.

Only 4% of the foreign-born Latino effect on recycling is accounted for by the NEP. Again, in the direct-effects model, ethnic differences remain even when participants perceive the environment similarly (Table 4). Here, too, higher NEP scores—all other factors equal—for the same individual results in a higher probability of frequent recycling. The probability of frequent recycling for the foreign-born, Latino male described above would be .14 given an NEP score of 1 and .28 with an NEP score of 4.

*Joining an environmental or conservation group.* Results in Table 5 show that foreign-born Latinos were significantly less likely than Whites to join an environmental or conservation group. U.S.-born Latinos were also significantly less likely to join an environmental group, although, substantively, the mean for U.S.-born Latinos and Whites differed by only one percentage point. Women and older respondents were also significantly less likely than men or younger respondents, respectively, to join; but those with postsecondary education and liberals were more likely than others to join an environmental or conservation group.

The probability of never joining an environmental group for a rural-dwelling, White male, 50 years old, with no college education, seven family

**TABLE 3**  
**Ordered Logistic Regression Estimates:**  
**Reading Nature or Conservation Magazines (N= 3,513)**

<i>Mean</i>	<i>Reading Nature or Conservation Magazines</i>	<i>Standard Deviation</i>
Sample	1.90	0.76
Black	1.71	0.95
U.S.-born Latino	1.88	0.92
Foreign-born Latino	1.94	1.32
Asian	1.92	1.08
White	1.93	0.71

<i>Parameter</i>	<i>Total-Effects MLE Coefficient</i>	<i>Direct-Effects MLE Coefficient</i>
Intercept 2	0.53***	-1.07****
Intercept	-1.31****	-2.94****
Black	-0.43****	-0.42****
U.S.-born Latino	-0.002	-0.003
Foreign-born Latino	-0.04	0.09
Asian	-0.02	-0.04
Gender	-0.37****	-0.42****
Age	0.01****	0.01****
Education	0.15*	0.17*
Urban	-0.26***	-0.27***
Family size	-0.003	0.01
Liberal	0.48****	0.39****
New Ecological Paradigm	—	0.43****
Model chi-square	153.91	243.35
Significance level	< .0001	< .0001
% correct predictions	59.2	61.8

NOTE: MLE = maximum likelihood estimate.  
 \* $p \leq .05$ . \*\*\* $p \leq .001$ . \*\*\*\* $p \leq .0001$ .

members, and liberal political leanings is .74, .77 for a Black male, .81 for a U.S.-born Latino, .91 for a foreign-born Latino, and .78 for an Asian. In the direct-effects model, all the predictor variables from the original model remained significant. In this instance, all other factors equal, more proenvironmental beliefs decrease the probability of never joining such groups. Take the example of a U.S.-born Latino female, 52 years old, with six family members, a high school education or less, living in an urban residence, with liberal political leanings, and an NEP score of 1. The probability of this individual never joining and environmental or conservation organization would be .87 with the above characteristics but would decrease to .64 with an NEP score of 5.

**TABLE 4**  
**Ordered Logistic Regression Estimates:**  
**Recycle Household Products (N = 3,513)**

<i>Mean</i>	<i>Recycle Household Product</i>	<i>Standard Deviation</i>
Sample	2.39	0.81
Black	2.10	1.21
U.S.-born Latino	2.43	1.03
Foreign-born Latino	1.88	1.68
Asian	2.61	0.79
White	2.46	0.71

<i>Parameter</i>	<i>Total-Effects MLE Coefficient</i>	<i>Direct-Effects MLE Coefficient</i>
Intercept 2	-0.17	-1.28****
Intercept	-1.13****	-2.25****
Black	-0.85****	-0.84****
U.S.-born Latino	-0.08	-0.09
Foreign-born Latino	-1.36****	-1.30****
Asian	0.15	0.14
Gender	0.19**	0.16*
Age	0.01****	0.01****
Education	0.43****	0.45****
Urban	0.58****	0.57****
Family size	0.14****	0.15****
Liberal	0.33****	0.27***
New Ecological Paradigm	—	0.29****
Model chi-square	282.57	319.52
Significance level	< .0001	< .0001
% correct predictions	62.6	63.5

NOTE: MLE = maximum likelihood estimate.  
 \* $p \leq .05$ . \*\* $p \leq .01$ . \*\*\* $p \leq .001$ . \*\*\*\* $p \leq .0001$ .

*Nature participation.* Participation in nature-based recreation was also modeled as a function of the same explanatory variables, and the probability of participation ( $Y = 1$  or "yes") was derived from logistic regression. In Table 6, Blacks, U.S.-born Latinos, and Asians are significantly less likely than Whites to engage in nature-based outdoor recreation activities. The same is true for older respondents and urbanites. Alternatively, foreign-born Latinos, those with education beyond high school, larger families, and liberals were significantly more likely to participate in such activities. The probability of an urban, Black female, age 40, with an education beyond high school, one family member, and a nonliberal political orientation participating in nature-

**TABLE 5**  
**Logistic Regression Estimates:**  
**Joining Environmental Group (N = 3,513)**

<i>Mean</i>	<i>Joining Environmental Group</i>	<i>Standard Deviation</i>
Sample	1.27	0.58
Black	1.21	0.65
U.S.-born Latino	1.20	0.66
Foreign-born Latino	1.08	0.60
Asian	1.24	0.69
White	1.30	0.56

<i>Parameter</i>	<i>Total-Effects MLE Coefficient</i>	<i>Direct-Effects MLE Coefficient</i>
Intercept 2	-1.09****	-1.94****
Intercept	-2.29****	-3.15****
Black	-0.17	-0.16
U.S.-born Latino	-0.39*	-0.40*
Foreign-born Latino	-1.23***	-1.17**
Asian	-0.23	-0.24
Gender	-0.27**	-0.30***
Age	-0.01***	-0.01***
Education	0.44****	0.44****
Urban	-0.15	-0.15
Family size	0.004	0.01
Liberal	0.52****	0.22**
New Ecological Paradigm	—	0.26****
Model chi-square	114.25	128.13
Significance level	< .0001	< .0001
% correct predictions	60.3	61.4

NOTE: MLE = maximum likelihood estimate.  
 \* $p \leq .05$ . \*\* $p \leq .01$ . \*\*\* $p \leq .001$ . \*\*\*\* $p \leq .0001$ .

based activities is .63. For a White female with similar characteristics, the probability increases to .87; for a U.S.-born Latino female, .74; for a foreign-born Latino female, .95; and for an Asian female, .76.

In the direct-effects model, the NEP does not substantially alter significance levels for the ethnic variables. Blacks and Asians remain less likely than Whites to engage in these activities, whereas foreign-born Latinos are still more likely than Whites to do so. Practically none of the Black and U.S.-born Latino effects are mediated through the NEP. Roughly 3% of the Asian effect is indirect, and about 9% of the foreign-born Latino effect is indirect. Again, consider the difference in probability of engaging in these environ-

**TABLE 6**  
**Logistic Regression Estimates: Nature Participation (N = 3,513)**

<i>Mean</i>	<i>Nature Participation</i>	<i>Standard Deviation</i>
Sample	0.87	0.34
Black	0.68	0.62
U.S.-born Latino	0.80	0.52
Foreign-born Latino	0.96	0.35
Asian	0.83	0.51
White	0.91	0.27

<i>Parameter</i>	<i>Total-Effects MLE Coefficient</i>	<i>Direct-Effects MLE Coefficient</i>
Intercept	2.19****	0.76*
Black	-1.36****	-1.35****
U.S.-born Latino	-0.85****	-0.86****
Foreign-born Latino	1.04*	1.13**
Asian	-0.77**	-0.79**
Gender	-0.09**	-0.13
Age	-0.01**	-0.01*
Education	0.43***	0.44***
Urban	-0.38**	0.39**
Family size	0.15****	0.17****
Liberal	0.51****	0.44***
New Ecological Paradigm	—	0.39****
Model chi-square	226.41	255.44
Significance level	< .0001	< .0001
% correct predictions	66.5	67.6

NOTE: MLE = maximum likelihood estimate.  
 \* $p \leq .05$ . \*\* $p \leq .01$ . \*\*\* $p \leq .001$ . \*\*\*\* $p \leq .0001$ .

mentally based activities for a respondent with different NEP scores. The probability of participating for a 32-year-old, urban, Asian female with an education beyond high school, three family members, who is not liberal, and who has an NEP score of 2 would be .79. The probability increases to .85 given an NEP score of 3.

## DISCUSSION AND CONCLUSION

We hypothesized a positive relationship between environmental belief and behavior. As expected, higher scores on the NEP resulted in more

frequent environmental behavior. We also expected the environmental behavior of ethnic minorities—Blacks, U.S.-born Latinos, foreign-born Latinos, and Asians—in total-effects analyses would differ significantly from White behavior. But given similar environmental beliefs for each group (direct-effects analyses), behavioral differences were expected to diminish significantly. Differences between Whites and the respective minority groups varied depending on the environmental behavior.

Consistent with expectations, total-effects results showed significant differences between Blacks and Whites for three of the four environmental behaviors: environmental reading, recycling, and nature participation. There were also significant differences in the total-effects models between U.S.-born Latinos and Whites for two behaviors, environmental group joining and nature participation. Also, in the total-effects analyses, foreign-born Latinos differed from Whites for three of four activities: recycling, environmental group joining, and nature participation. Contrary to expectations, however, Asians and Whites differed significantly only for nature participation. Blacks and foreign-born Latinos also reported significantly lower scores on the NEP compared to Whites (Table 7).

Further, strong, significant differences between Whites and the four ethnic minority groups remained after inclusion of the NEP, indicating that the direct, ethnic effect for these groups is much more powerful than the effect mediated through the NEP. The relative weakness of the beliefs/attitudinal variable in our model to account for behavioral differences may be because of methodological errors. As mentioned, five NEP items were excluded from the NSRE. Also, the model does not include an indicator for perceptions regarding a specific natural resource or general life values (although general life values are not operationalized by Dietz et al., 1998). Data on general life values were not collected with the NSRE; however, we do not believe that the absence of this indicator impairs the model's theoretical soundness because the NEP encompasses elements of generalized values.<sup>10</sup>

There may also be theoretical and conceptual errors with the model. Tarrant and Cordell (1997) discussed three reasons for the lack of correlation between attitudes and behavior: (a) a lack of specificity between attitudinal and behavioral measures, (b) a poor quality of attitudinal measures, and (c) a failure to recognize the influence of external factors. We had no perceptual questions relating specifically to the environmental behaviors included in our analyses. Johnson, Horan, and Pepper, (1997) found that a perceptual variable reduced Black/White differences for wildland visitation. In that analysis, the perceptual or attitudinal variable was specific to the measured behavior, wildland recreation participation. NEP and other environmental belief and concern measures have also been criticized because they fail to

**TABLE 7**  
Statistical Difference Between Whites and Ethnic Minorities for Environmental Belief and Behavior

Group	NEP	Environmental							
		Reading		Household Recycling		Group Joining		Nature Participation	
		TE	DE	TE	DE	TE	DE	TE	DE
Black	—	—	—	—	—	ns	ns	—	—
US Latino	ns	ns	ns	ns	ns	—	—	—	—
Foreign-born Latino	—	ns	ns	—	—	—	—	+	+
Asian	ns	ns	ns	ns	ns	ns	ns	—	—

NOTE: NEP = New Ecological Paradigm; TE = total effects; DE = direct effects.

consider trade-offs between environmentally responsible choices and competing activities.

In addition, Wall (1995b) proposed that the lack of congruency between environmental concern and behavior may have to do more fundamentally with the context in which environmental action is required. For instance, people may engage in a particular environmental activity because it is relatively convenient to do so, and this factor may be more powerful than either demographic characteristics or environmental attitudes in predicting environmental participation.

Our results show that environmental belief and activism vary by ethnicity despite similarity for certain socioeconomic characteristics and environmental belief. Most important, findings show that the category of ethnic minority environmental perception and behavior is not homogeneous when compared to Whites. Blacks and foreign-born Latinos were least similar to Whites, Asians most like Whites, and U.S.-born Latinos assumed a middle position between Blacks and foreign-born Latinos and Asians. Especially interesting are differences between the two Latino groups. U.S.-born Latino beliefs and behaviors more closely resembled White environmentalism than foreign-born Latino environmentalism. These findings highlight the importance of distinguishing between Latinos by criteria such as immigrant status, acculturation level, language, or country of origin.

Because of data limitations, this study did not distinguish among Asian respondents. Problems associated with single categorizations of ethnic groups were discussed earlier. Because the Asian sample was presented as a homogenous ethnic group, we exercise caution in speculating about why Asian environmentalism appears more proenvironmental or representative of the majority culture than that of the other minorities in this study. This

caveat notwithstanding, some comments can be made regarding these findings.

The relatively stronger environmentalism reported by Asians is consistent with findings in other structural areas, for example, educational attainment and earnings (Alba & Nee, 1997; Hirschman & Wong, 1986), which indicate that Asians are more integrated into the American social structure than some other ethnic minorities. As discussed earlier, it could be that the relatively proenvironmental stance reported by Asians in this study is a carryover of the nature holism of traditional Asian cultures; however, these findings may also reflect a greater willingness of Asians to adapt American ideals. According to Hirschman & Wong (1986, p. 4), "It is the acculturation of Asians to the American middle-class value system that accounts for their high level of achievement . . . particularly the values, skills, attitudes, goals, and expected behavior of the middle-class majority" (although Ovando [1999] cautioned against stereotyping Asians as conformist, model minorities). Thus, it may be that Asians have acculturated not only middle American educational aims but also mainstream environmental values and behavior. In contrast to Asians, Latinos and Black Americans with similar education, income, and residential characteristics as Whites, may be less willing to adapt certain core values of the White majority.

Concerning our observations for Blacks, findings suggest support for Jones's (1998) supposition that Black environmentalism may not focus on mainstream environmental activities such as those included in this study. Arp and Kenny (1996) also maintained that Blacks are reluctant to participate in environmental activities they believe have little chance of effecting meaningful change. Because a greater proportion of the Black population than the White occupies a marginal position in American society, it may be that Blacks focus more of their attention and efforts on environmental activities in which they feel a greater sense of power and personal efficacy to bring about observable change (Parker & McDonough, 1999). Black environmentalism may concentrate more on grassroots environmental justice issues involving toxins in the workplace and home, hazardous waste disposal, and even concerns regarding neighborhood crime and access to quality, outdoor recreation opportunities (Di Chiro, 1996; Taylor, 2000).

There are significant differences between each ethnic group and Whites for the nature-based activities. This environmental behavior differs from the others in that it is related more to interactive, leisure-time pursuits where the natural world provides the context or place of involvement. Prior studies show ethnic differences for these types of activities for Blacks and Whites. Fewer differences have been reported between Whites and Latinos or Whites and Asians (Gramann, 1996, p. xi). Some of the outdoor areas where these

nature-based activities occur have been termed *White Nature* (DeLuca, 1999, p. 223)—White in the sense that they are associated with Anglo-American values rooted in European romanticism, conservation, and preservation (Taylor, 1997).

Our results challenge this explanation because foreign-born Latinos were more likely to participate in nature-based outdoor recreation than Whites. This finding is inconsistent with other results in this study showing that foreign-born Latinos were less likely than Whites to report more proenvironmental beliefs as measured by the NEP. Foreign-born Latinos were also less likely to say they recycled or joined environmental groups frequently. Again, though, nature participation represents a different type of environmental engagement than does reading, recycling, or group joining. It may be that activities included in nature participation such as backpacking, hiking, gardening, or viewing birds or fish are carryover leisure-time or, possibly, subsistence (gardening) activities in which foreign-born Latinos engaged in their native countries.

Other social structural variables included in the model also demonstrated consistently strong associations with both environmental belief and behavior. With respect to gender and environmentalism, our results corroborate those discussed by Olli et al. (2001) who posited that women generally show more environmental concern than men but less activism. We found that women were more likely than men to score higher on the NEP but were less likely than men to more frequently read environmental material or participate in environmentally based groups. Our findings are also consistent with McStay and Dunlap (1983) who contend that women engage more than men in private, home-based environmental behaviors in contrast with more public activities involving politics. Women in our study were more likely than men to recycle household products. This was the only behavior where women reported more activity than men.

Age was also a consistent explanatory variable for both environmental belief and behavior. Increasing age was associated with lower NEP scores—a finding similar to studies reported elsewhere. In both the total- and direct-effects models, older persons reported more reading and recycling than younger ones but less group joining and participation in outdoor recreation activities. The latter finding is expected given the greater amount of energy and stamina needed for activities subsumed within the nature-based variable. Surprisingly, postsecondary education level was not related to higher NEP scores. However, it was a much stronger predictor of all four environmental behaviors. Urban residence was not associated with environmental belief, but urbanites were less likely than those living outside an urban area to read environmental literature or to participate in nature-based activities.

Urbanites were more likely than others to recycle. Respondents with larger families reported lower levels of environmental belief, greater recycling frequency, and were more likely to say they participated more often in nature-based activities. As expected, those categorized as liberals reported higher NEP scores and had a consistently positive relationship to each environmental behavior.

The present study is an attempt to move beyond the dichotomy of Black versus White environmental behavior—to consider environmental perception and to examine environmentally relevant behavior between other ethnic minority groups. Again, how various ethnic groups interact with the environment and perceive of it is important given that much of the country's population growth is expected to be fueled by growth from some of these groups. To conclude, we call for more theorizing and empirical assessments of factors that might constrain environmental behavior. This research would focus on the role of the state and how the ordinary citizenry perceives of the state as providing relief for environmental crises. Second, it would examine people's sense of personal agency and efficacy in addressing environmentalism on a local level. Third, it would explore people's faith in or reliance on official indicators of environmental problems. These are important considerations for natural resource managers and others interested in the impact of changing population compositions on the natural world.

## NOTES

1. We describe these groups as *ethnic* rather than *racial*, because *race* is an imprecise category for describing many people in today's society. In the remainder of the article, we use the categories in the survey instrument (National Survey on Recreation and the Environment 2000; see Cordell et al., 1996) to refer to ethnic groups. Respondents selected from among six major ethnic categorizations including "Black or African American," "Hispanic, Latino, or Spanish," "Asian," or "White." Other ethnic categories were also included but, because of low sample sizes, were not analyzed. Except for the Latino groups, we use one-word descriptors to designate ethnic categories.

2. Values, specific beliefs, and intentions were not included in the model because no valid indicators of these constructs were available from our survey. The model's predictive ability may be compromised by the exclusion of these variables.

3. Castles and Miller (1998, p. 145) noted that, since 1978, the Asian continent has supplied the primary sojourners to the United States. Asia contributes up to 50% of the country's immigrants. Assuming a medium immigration rate of 820,000 persons over the next 50 years, by the year 2050, the U.S. population is expected to be split evenly between Whites (50%) and minority groups (50%) (National Research Council, 1997, pp. 113-115).

4. Consider Gans's (1979) *symbolic* and Stein and Hill's (1977) *dime store* ethnicity.

5. Ethnic categorizations used in the American context such as *Asian American*, *Latino*, or *desi* (Prashad's [2000] discussion of South Asian American identity) are collective identities based on identifiers such as region of origin, language, or physical appearance. As such, groups subsumed under these categorizations may have little in common besides the above-mentioned characteristics or may include groups that have been traditionally hostile to one another.

6. We realize the possible bias in selecting these behavioral items. Selection of other measures that have been shown to be more salient among ethnic minorities may have produced results different from those reported here. This important consideration was pointed out by an anonymous reviewer.

7. Seventy-seven percent of foreign-born Latinos came to the U.S. between 1980 and 1999; 38.6% arrived between 1990 and 1999.

8. Asians and Latinos were more likely than the other groups to respond "don't know."

9. McClendon (1994, pp. 291-299) and Alwin and Hauser (1975) estimated ordinary least squares regression models; however, the techniques specified may also be applied to logistic models.

10. In causal models, the omission of intervening variables does not result in biased estimates for the total effects of exogenous variables. Rather, the bias is included in the indirect effects of the exogenous variables (McClendon, 1994, pp. 291-294).

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