Black, White, or Green: The Powerful Influence of Ethnicity on Pro-environmental Attitudes and Behaviors.

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ABSTRACT

While the recent environmental movement has enjoyed much success in generating pro-environmental attitudes in the public, it has not found similar success when it comes to generating pro-environmental behaviors. This phenomenon is supported by ample research suggesting that attitudes are not effective predictors of behaviors, especially in the case of environmental issues. This research examines the attitude-behavior relationship through a cultural lens by comparing the pro-environmental dispositions and behaviors of five key ethnic groups. Specifically, the study tested 2,500 subjects for cultural identification, agreement with the New Ecological Paradigm, and self-reported environmental behaviors. The research found significant differences between the ethnic groups on attitude-behavior correlations and environmental dispositions. These findings indicate that ethnicity is not only a strong predictor of environmental disposition, but also of the likelihood a person will convert pro-environmental attitudes into pro-environmental behaviors.

INTRODUCTION

In social psychological literature, theories such as Ajzen's theory of planned behavior (1991) and Festinger's theory of cognitive dissonance (1957) have spawned a collection of related theories, each offering a novel new lens for observing the complicated network of influences that ultimately drive human behavior. For many of these new theories, the resulting models do not embrace dramatically different interpretations of the attitude-behavior dynamic, but rather tweak existing models of behavior for better predictive power in specific environments. For example, traditional models of behavior have shown to be unreliable at explaining pro-environmental behavior, as their generalized forms often focus too heavily on one causal factor, such as attitudes, at the expense of other causal factors, such as context (Stern, 2000, p. 416). As a result, new models such as Stern's Value-Belief-Norm (VBN) theory have emerged to explain the unique catalysts of environmentally significant behavior(Oreg, 2006).

While these emerging models may differ in the behaviors they hope to explain, they all share the understanding that many factors – from religious upbringing to physical limitations –work in concert to determine the likelihood of a specific behavior occurring. This research aims to empower researchers and social marketers with a richer understanding of the overarching

influences and structures affecting the emergence of pro-environmental behaviors. Specifically, this study examines the sum-total influence of ethnicity on:

a.) pro-environmental attitudes;
b.) pro-environmental behaviors; and
c.) the correlation between pro-environmental attitudes and pro-environmental behaviors.

BEHAVIOR BY CONTEXT

Several studies have examined the consequences of social structures and demographic differences on pro-environmental behavior. In their review of these studies, Van Liere and Dunlap found convincing evidence supporting age, education, and political ideology as indicators reliably associated with pro-environmental concern (1980, p. 192). In another study, gender was shown to associate strongly with environmental concern, with women holding stronger pro-environmental dispositions than men (Davidson & Freudenburg, 1996). Interestingly, other frequently hypothesized factors, such as place of residence and job prestige were found to exhibit only weak associations with pro-environmental behavior (Van Liere & Dunlap, 1980, p. 192).

Likewise, studies considering the affect of religion on environmental behaviors have been inconsistent, revealing only small negative correlations between fundamental Christian beliefs and pro-environmental attitudes. However, a more recent study of the religious beliefs and environmental practices of 2,100 university students from several countries has challenged the findings of the inconsistent previous studies, suggesting instead that Christianity is actually positively correlated with an anthropocentric form of environmentalism, which was not accounted for in the studies (Schultz, Zelezny, & Dalrymple, 2000, p. 588). In summary, save the few factors mentioned above, the literature assessing the influence of specific demographic and social variables on pro-environmental behavior has been largely inconsistent. Van Liere and Dunlap explain this "limited utility of demographic variables in explaining variation in environmental concern" as resulting from the "widespread distribution of such concern in our society" (1980, p. 193).

BEHAVIOR BY ATTITUDES

Drawing from a more traditional social-psychological approach, another vein of literature focuses tightly on the role of attitudes in directing environmental behavior. In his article assessing the psychological dimensions of environmental behavior, Stern argues "attitudes are likely to affect behavior when other factors do not constrain their expression" (1992a, p. 279). In other words, in the absence of contextual influences, pro-environmental attitudes are powerful predictors of pro-environmental behavior.

To detect the presence of behavior influencing pro-environmental attitudes, many researchers have embraced a version of Dunlap and Van Liere's New Ecological Paradigm (NEP). The NEP scale works by determining a respondent's ecological worldview through a 15-item assessment of generalized values, attitudes, and beliefs (Dunlap, Van Liere, Mertig, & Jones, 2000a, p. 427).

The original NEP scale has proven infallible in dozens of studies across several decades, leading to a near consensus that positive scores on the scale are associated with pro-environmental attitudes (Edgell & Nowell, 1989; Gooch, 1995). Strictly speaking, researchers consider the scale to be a predictor of environmental attitudes rather than a measure of environmental attitudes, as it detects only the psychological conditions likely to engender pro-environmental attitudes (Pierce, Dalton, & Zaitsev, 1999; Stern, Dietz, & Guagnano, 1995c).

Important to this research, the NEP scale has proven effective in the few studies examining the influence of ethnicity on pro-environmental attitudes and behavior. In a study considering the influence of Hispanic culture on environmental attitudes, researchers selected the NEP scale because previous studies have suggested it to be the "best instrument for obtaining data on the potential effects of ethnicity on environmental attitudes" (Noe & Snow, 1990, p. 28). In another study of the environmental perspective of African-Americans, the researcher selected the NEP scale to ensure directly comparative analysis with the largest collection of other related studies (Caron, 1989). Finally, in a study comparing the sources of environmentalism in Japan against the United States, researchers leveraged the NEP's broad worldview assessment to better capture and delineate culture-wide differences (Pierce, Lovrich, Tsurutani, & Abe, 1987).

MULTIVARIATE MODELS OF BEHAVIOR

To better account for both the attitudinal and contextual factors influencing pro-environmental behavior, several multivariate models have emerged to help researchers better navigate the interplay between external and internal influences on behavior. One of these models, the value-belief-norm (VBN) model of social behavior, establishes a five-variable chain leading to behavior. The chain begins with internal influences such as personality and belief structure, and ends with agreement on the NEP scale. The theory argues that each variable has consequence on the next, with causal order established on empirical support from previous research. Essentially, the model suggests that personal norms simply frame an individual's predisposition for pro-environmental behavior, and require activation through the rest of the causal chain to ultimately culminate in behavior (Stern, Dietz, Abel, Guagnano, & Kalof, 1999b). Another multivariate model finding support in related literature is the ABC model of environmentally significant behavior(Zepeda & Deal, 2009). This model eliminates the causal chain found in other models by collapsing all variables into either (A) attitudinal or (C) contextual factors. Within this simplified structure, the model posits that attitudes, regardless of strength, will result in behaviors at a frequency relative to the strength of external (contextual) influences (Guagnano, Stern, & Dietz, 1995). For example, individuals lacking access to recycling facilities will not exhibit recycling behaviors, regardless of the strength of their pro-environmental orientation.

HYPOTHESES

In literature, attempts to quantify the influential value of the many variables governing the appearance of pro-environmental behaviors have been crippled by inconsistencies and caveats. While one study found fundamental Christianity to be negatively associated with environmentalism (for the sake of the planet), another found it to be positively associated with environmentalism (for the sake of humans). Similarly, while one study found urban residents to

be only slightly more concerned about (global) environmental issues, another found them to be significantly more concerned about (local) environmental issues. Unfortunately, these limitations are not correctable with more precise research, as they are actually the penalty of precise research. Simply put, the nuanced network of influences surrounding any specific behavior is fully unique to the setting in which it is activated. By focusing too tightly on any single variable – such as a specific religion or specific environmental attitude – researchers forgo measurement of other variables critical to the behavior process. In pro-environmental terms, researchers are missing the forest for the trees.

The influences leading to pro-environmental behavior are often highly personal and fluid. What resulted in a certain pro-environmental behavior one day may not the next. As a result, models hoping to generalize findings about pro-environmental attitudes and behaviors must be willing to sacrifice precision in one research facet to gain it in another. To find consistency in studies, researchers must be as committed to discovering what is happening generally as they are why it happened specifically. In this light, it is not surprising that two of the most dependable tools in supporting literature adhere to this principal of high-level research. The NEP scale, which runs counter to traditional theory by predicting attitudes from generalizations, has enjoyed decades of reliable findings by focusing more on the types of people that hold attitudes than the types of attitudes people hold. Similarly, the ABC model of behavior forgoes weighing individual influences in a causal series in favor of weighing the sum total of influences acting for or against a specific behavior. As a result, the model is able to absorb fluctuations in variables that would skew more rigid and precise models.

Keeping form, this research intends to assess the sum-total influence of ethnicity on pro-environmental behavior in the following ways:

H1. As a collective contextual influence, ethnicity influences the level of agreement with the New Ecological Paradigm.
H2. As a collective contextual influence, ethnicity influences reported pro-environmental behavior.
H3. As a collective contextual influence, ethnicity influences the correlation between pro-environmental attitudes and pro-environmental behaviors.

METHOD

The data for this study was derived from the “river” methodology and panels maintained by DMS Insights. For the English-speaking sample, respondents were originally sampled via the Opinion Place online "river" methodology. This method has also been referred to as "RDD for the web" as it uses broadcast promotional intercepts to generate a flow of respondents to the Opinion Place site. Respondents are screened and assigned to surveys in real-time, and are not considered registered panelists since most do not return to the site for ongoing survey participation.

For the Spanish-speaking sample, respondents were invited from Tu Opinión Latina, a bilingual online Hispanic panel. Given the quota requirements for this study (see the quotas in the Appendix), a random sample of respondents was selected based on their demographic characteristics and invited to participate in this special survey opportunity via a custom email invitation. Quotas were closed when filled. The quotas were derived from the US Census Bureau American Community Survey data by gender, age, ethnicity, and region of the country. Respondents completed the survey by clicking on a link in the email invitation, which connected them with the online questionnaire. Respondents obtained a $1 credit to a PayPal account, miles in the American Airlines AAdvantage program, $1 towards a gift card for Amazon.com, among other incentives. In all, a sample of 2,500 participants representing five ethnicities completed online surveys.

MATERIALS

Survey measures included self-reported, pro-environmental behaviors and agreement with the New Ecological Paradigm. Pro-environmental behaviors were measured across five items. Three of the items asked respondents to rate the following statements on a Likert-type scale ranging from 1 (completely disagree) to 5 (completely agree):

- I recycle whenever possible.
- I am replacing old light bulbs with energy efficient ones.
- I buy ecologically friendly products for my home.

Two items asked respondents to rate the following statements on a Likert-type scale ranging from 1 (not important) to 5 (extremely important):

- Buying environmentally friendly products.
- Replacing my current car with an energy-efficient one.

Agreement with the New Ecological Paradigm was measured through an abbreviated, eight-item version of the original scale. The scale was truncated due to space limitations on the instrument. The NEP scale was selected for its reliability in accurately assessing the pro-environmental orientation of respondents. The scale also has demonstrated validity as a single construct measure (Dunlap, Van Liere, Mertig, & Jones, 2000b, p. 430). This quality allows for item reduction without concern for protecting dimensionality. The items were selected according to internal reliability scores published from previous studies (Dunlap, Van Liere, et al., 2000b). Respondents were asked to rate the following statements on a Likert-type scale ranging from 1 (strongly disagree) to 5 (strongly agree):

- Humans are severely abusing the environment.
- Plants and animals have as much right as humans to exist.
- The balance of nature is strong enough to cope with the impacts of modern industrial nations.
- The so-called ecological crisis facing human kind has been greatly exaggerated.

- The Earth is like a spaceship with very limited room and resources.
- Humans were meant to rule over the rest of nature.
- The balance of nature is very delicate and easily upset.
- If things continue on their present course, we will experience a major ecological catastrophe.

Demographic measures included age, gender, ethnicity, country of birth, employment status, income, and household information.

Results: H1

Reliability analysis for the eight items measuring agreement with the NEP revealed an initial Cronbach's alpha of .641. However, after the elimination of three detracting questions, the Chronbach's alpha score improved to .781, meeting Nunnally's suggested minimum alpha requirement of .7 (Nunnally & Bernstein, 1994). Scores for the five remaining questions were summed and averaged to represent level of agreement with the NEP. Because the items were coded in the same direction as the Likert-scale, larger mean scores reflect greater pro-environmental disposition:

Table 1
Average Agreement with NEP Scale

Ethnicity	N	Raw Mean
CAUCASIAN	504	3.3865
AFRICAN AMERICAN	441	3.5061
ASIAN/PACIFIC ISLANDER	474	3.6523
HISPANIC ENGLISH	463	3.6199
HISPANIC SPANISH	449	3.9693
Total	2331	3.6218

To compare the mean NEP scores across cultures for significant difference, the data underwent a rank transformation, was tested parametrically (anova), and converted using Puri & Sen's L statistic for comparing ranked means (Puri & Sen, 1985). The result was an X^2 value of 76.956 and an associated p of < .05 (p = .000). For comparative purposes, the following grid summarizes the differences in raw mean scores for NEP agreement across the five ethnicities:

Table 2
Mean Differences Across Groups for Pro-Environmental Dispositions

Ethnicity	Ethnicity2	Raw Mean Difference
CAUCASIAN	AFRICAN AMERICAN	-0.11961
	ASIAN/PACIFIC ISLANDER	-.26581*
	HISPANIC ENGLISH	-.23336*
	HISPANIC SPANISH	-.58276*
AFRICAN AMERICAN	CAUCASIAN	0.11961
	ASIAN/PACIFIC ISLANDER	-0.1462
	HISPANIC ENGLISH	-0.11375
	HISPANIC SPANISH	-.46314*
ASIAN/PACIFIC ISLANDER	CAUCASIAN	.26581*
	AFRICAN AMERICAN	0.1462
	HISPANIC ENGLISH	0.03245
	HISPANIC SPANISH	-.31694*
HISPANIC ENGLISH	CAUCASIAN	.23336*
	AFRICAN AMERICAN	0.11375
	ASIAN/PACIFIC ISLANDER	-0.03245
	HISPANIC SPANISH	-.34939*
HISPANIC SPANISH	CAUCASIAN	.58276*
	AFRICAN AMERICAN	.46314*
	ASIAN/PACIFIC ISLANDER	.31694*
	HISPANIC ENGLISH	.34939*
***. The mean difference is significant at the 0.05 level.**		

While each ethnicity differed significantly from at least one other ethnicity on NEP agreement, Spanish–speaking Hispanics scored significantly higher than every other ethnicity.

Because previous studies revealed a possible gender influence on NEP scores, the data was sorted and processed again to rule-out sex as an alternative explanation. While females were sampled heavier in the data (~10%), a significant difference was not found between men and women in terms of overall NEP scores (F = .098, p = . 754). Interestingly, when the effects of gender were observed by ethnicity, the only significant relationship was in Asian/Pacific Islanders, where men scored significantly higher on the NEP measure than women.

Based on the statistical findings and lack of alternative explanations, the data supports the hypothesis that ethnicity and NEP scores are correlated.

RESULTS: H2

Reliability analysis for the five items measuring reported pro-environmental behavior revealed a Cronbach alpha of .802 with no detracting items. As in the NEP measure, items measuring reported behavior were summed and averaged into a new variable for analysis. Also like the NEP measure, larger mean scores represent more reported pro-environmental behavior:

Table 3
Average Reported Pro-Environmental Behaviors

Ethnicity	N	Raw Mean
CAUCASIAN	514	3.1599
AFRICAN AMERICAN	472	3.2458
ASIAN/PACIFIC ISLANDER	483	3.6149
HISPANIC ENGLISH	471	3.4637
HISPANIC SPANISH	470	4.0043
Total	2410	3.492

To compare the mean NEP scores across cultures for significant difference, the data underwent a rank transformation, was tested parametrically (anova), and converted using Puri & Sen's L statistic for comparing ranked means. The result was an X^2 value of 198 with an associated probability of < .05 (p=.000). For comparative purposes, the following grid summarizes the differences in raw score means for reported pro-environmental behavior:

Table 4
Mean Differences Across Groups for Pro-Environmental Behaviors

Ethnicity	Ethnicity	Mean Difference (I-J)
CAUCASIAN	AFRICAN AMERICAN	-0.08584
	ASIAN/PACIFIC ISLANDER	-.45498*
	HISPANIC ENGLISH	-.30377*
	HISPANIC SPANISH	-.84433*
AFRICAN AMERICAN	CAUCASIAN	0.08584
	ASIAN/PACIFIC ISLANDER	-.36914*
	HISPANIC ENGLISH	-.21793*
	HISPANIC SPANISH	-.75849*
ASIAN/PACIFIC ISLANDER	CAUCASIAN	.45498*
	AFRICAN AMERICAN	.36914*
	HISPANIC ENGLISH	0.15121
	HISPANIC SPANISH	-.38935*
HISPANIC ENGLISH	CAUCASIAN	.30377*
	AFRICAN AMERICAN	.21793*
	ASIAN/PACIFIC ISLANDER	-0.15121
	HISPANIC SPANISH	-.54056*
HISPANIC SPANISH	CAUCASIAN	.84433*
	AFRICAN AMERICAN	.75849*
	ASIAN/PACIFIC ISLANDER	.38935*
	HISPANIC ENGLISH	.54056*
*. The mean difference is significant at the 0.05 level.		

The raw scores for reported behavior compare remarkably similar to the raw scores for NEP agreement. Again, while each group was significantly different from at least one other group, Spanish-speaking Hispanics were significantly more likely than all other groups to report pro-environmental behavior. Follow-up analysis also revealed no significant overall difference in reported behavior in terms of gender.

Based on the statistical findings and the absence of alternative explanations, the data supports the hypothesis that ethnicity and reported pro-environmental behavior are correlated.

RESULTS: H3

Correlations between pro-environmental dispositions, as measured by the NEP scale, and self-reported, pro-environmental behaviors were calculated as a whole and by ethnicity. In each instance, there was a strong, positive relationship between pro-environmental disposition and reported pro-environmental behaviors, with scores ranging from r=.433 to r=.677. The following grid details the correlations by ethnicity:

Table 5
Attitude-Behavior Correlations

Ethnicity	Column1	Value	Sig
CAUCASIAN	Pearson's R	0.591	.000c
	N	493	
AFRICAN AMERICAN	Pearson's R	0.539	.000c
	N	427	
ASIAN/PACIFIC ISLANDER	Pearson's R	0.646	.000c
	N	466	
HISPANIC ENGLISH	Pearson's R	0.677	.000c
	N	453	
HISPANIC SPANISH	Pearson's R	0.433	.000c
	N	437	
Grand Correlation	Pearson's R	0.607	000c
	N	2276	

There is no omnibus test for the comparison of three or more correlations, which is called for in the third hypothesis. As a result, the 10 possible combinations of ethnicities were tested individually using a Z-test with Fisher's Z-transformations. Unfortunately, by conducting multiple tests, the likelihood of making a type 1 error in the analysis increased dramatically. Therefore, to preserve the overall research alpha of .05, a Bonferroni adjustment was applied to the findings requiring a z-score of at least 2.807 (p=.005) to be considered significant. The following grid details the z-scores associated with each of the relationships:

Table 6
Bonferroni Adjusted Z-Scores

Ethnicity	NHW	AA	Asian	HE	HS
NHW	*	1.168	1.363	2.235	3.288*
AA	1.168	*	2.495	3.307*	2.054
Asian	1.363	2.495	*	0.841	4.581*
HE	2.235	3.307*	0.841	*	5.379*
HS	3.288*	2.054	4.581*	5.379*	*
Total	0.679	1.943	1.269	2.335	4.592*

* Indicates correlation is significant at the Bonferroni corrected .005 level.

DISCUSSION

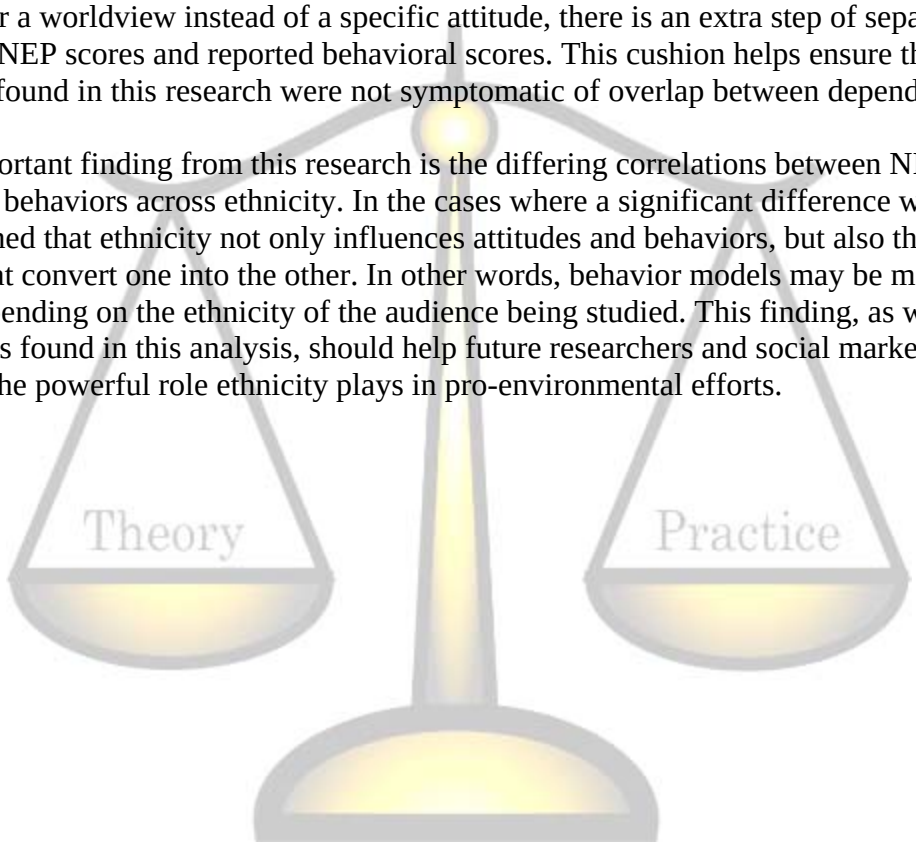
In this study of ethnicity's influence on the cognitive processes leading to pro-environmental behavior, it was found that reported ethnicity was significantly correlated to agreement with the NEP scale (indicating pro-environmental orientation), reported pro-environmental behaviors, and the relationship between NEP agreement and related behaviors. When viewed through the framework of the popular ABC model of behavior, these findings offer new and powerful insight into each of the formula's three main components. Before considering these contributions, it should be recognized that the term *ethnicity*, as it appeared in this research, is perhaps not the best descriptor of the phenomenon being studied. In its strict, categorical sense, *ethnicity* does not effectively capture the ranging influences under review in this study. A more conceptually accurate descriptor for the phenomenon is *culture*, as it captures both the rigid influences of bloodline as well as the countless soft influences of the society sharing that bloodline. *Ethnicity* was used in this study for quantifying purposes, as it serves as a hard marker for groups of people likely experiencing similar social influences. ANOVA tests conducted in this study consistently found greater variance between groups than within groups, suggesting *ethnicity* to be an effective tool for grouping people with similar influences. Furthermore, by using *ethnicity* as the predictor variable in the analysis, we can establish a simple causal order. While attitudes may in part influence someone's culture, they certainly have no influence on someone's ethnicity!

Ethnicity, with all of its cultural pressures, influences the behavioral process contextually at every stage. In the ABC and VBN theories, attitudes are thought to be the agents against which contextual influences react to promote or discourage related behaviors. While establishing ethnicity's precise mechanism of influence is outside the scope of this study, it can be examined loosely through the general lenses of established models such as Festinger's theory of cognitive dissonance. Hypothetically, ethnicity may begin work as an agent builder at birth, when inherited

personality traits start to take shape. From there, ethnicity begins to instill the beliefs and values shared by others with similar heritages through powerful social structures like church and family. Finally, ethnicity settles into a role of attitude adjuster, carefully tweaking existing attitudes to agree with new and changing external pressures.

Whatever the mechanism of influence, this analysis demonstrated that ethnicity significantly influences pro-environmental disposition. This alone is valuable, as many studies have found that pro-environmental disposition, as measured by the NEP scale, causes pro-environmental behavior (Blake, Guppy, & Urmetzer, 1997; Ebreo, Hershey, & Vining, 1999; O'Connor, Bord, & Fisher, 1999). In fact, it could be this correlation alone that accounts for the relationship this research found between ethnicity and pro-environmental behavior. Fortunately, because the NEP scale tests for a worldview instead of a specific attitude, there is an extra step of separation between the NEP scores and reported behavioral scores. This cushion helps ensure the high correlations found in this research were not symptomatic of overlap between dependent variables.

Another important finding from this research is the differing correlations between NEP scores and reported behaviors across ethnicity. In the cases where a significant difference was found, it can be assumed that ethnicity not only influences attitudes and behaviors, but also the cognitive processes that convert one into the other. In other words, behavior models may be more or less effective depending on the ethnicity of the audience being studied. This finding, as well as several others found in this analysis, should help future researchers and social marketers better account for the powerful role ethnicity plays in pro-environmental efforts.



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