

# Gender, Ethnic Identity, and Environmental Concern in Asian Americans and European Americans

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## Abstract

*There are relatively few articles in sociology and psychology on gender, ethnicity, and the environment, yet ethnic and gender neutral approaches to sustainability may be incomplete. We studied gender, ethnicity, and environmental concern with an internet sample of Asian American women (n=157) and men (n=69), and European American women (n=222) and men (n=99). Participants completed the New Ecological Paradigm measure (NEP; Dunlap et al., 2000), the value bases of environmental concern (Schultz, 2000), and the Multigroup Ethnic Identity Measure-Revised (MEIM-R; Phinney & Ong, 2007). A 2 (ethnicity) x 2 (gender) ANOVA found no gender or ethnic differences on the NEP. A 2 (ethnicity) x 2 (gender) MANOVA with the three value bases as dependent variables found significant effects for ethnicity and gender. Ethnic identification enhanced cultural influences on environmental concern. Findings are discussed in terms of the marketing of environmental sustainability to address climate change and other environmental risks.*

**Keywords:** Environmental Concern, Gender, Ethnic Identity, Environmental Values

## Introduction

Global warming has already changed the earth's climate and is expected to lead to more severe weather events (like

hurricanes), increased ecosystem stresses, shifting precipitation patterns, increased ranges of infectious diseases, coastal flooding, and other potentially devastating impacts (World Resources Institute, 2009). Most climate scientists acknowledge that human activities (in particular the burning of fossil fuels and deforestation) strongly contribute to global warming (Intergovernmental Panel on Climate Change, 2007). Although the development of new technologies is key to reducing climate change, human behavior change is also necessary for mitigation and adaptation. This means that the psychological and sociological study of sustainable behavior is important.

This study focuses on environmental concern (EC), an environmental attitude defined as "the affect (i.e., worry) associated with beliefs about environmental problems" (Schultz, Shriver, Tabanico, & Khazian, 2004, p. 31). Social scientists are motivated to study environmental concern because if we are to move towards environmental sustainability, we need to better understand the environmental worldviews that influence resource consumption and pollution (Castro, 2006). Gender and ethnic differences in environmental concern are potentially important in developing targeted interventions intended to increase personal sustainability behaviors. To be effective, environmental messages may need to be tailored to specific groups (Milfont, Duckitt, & Cameron, 2006; Schultz & Zelezny, 2003). Because humans are not homogeneous, ethnic neutral and gender neutral approaches to proenvironmental behavior may lead to incom-

plete understandings of what is needed to change behavior (MacGregor, 2010). Our study examines gender and ethnic differences in EC in a sample of European Americans and Asian Americans.

We used two measures of environmental concern: the New Ecological Paradigm, also known as the NEP and developed by Dunlap, Van Liere, Mertig, and Jones (2000), and the Value Sources of Environmental Concern, developed by Schultz (2001). Both are often used to study cross-cultural differences in environmental concern and cross-cultural research supports the universality of both measures. Grounded in social-psychological attitude theory with established reliability and validity (Hawcroft & Milfont, 2010; Schultz, 2001), both instruments see environmental concern as based in the values that underlie more specific environmental attitudes, behaviors, and beliefs (Schultz et al. 2005; Snelgar, 2006).

In contrast to the "dominant social paradigm" (DSP), which views humans as separate from, and superior to nature, the NEP conceives of environmental concern as endorsement of a new ecological worldview where humans are a part of nature. Items measure beliefs about humanity upsetting the balance of nature, limits to growth, humanity's right to rule over the rest of nature, the belief that through human ingenuity we can control nature, and the possibility of an eco-crisis. Despite its widespread use, the original measure (Dunlap & Van Liere, 1978) was criticized (Dunlap, 2008; Lalonde & Jackson, 2002; Scott & Willits, 1994). We used the revised version which addresses weaknesses of the original scale and is more grounded in psychological research on attitudes, values, and behavior. Although some have questioned the NEP's applicability outside of Western nations (Chatterjee, 2008), on balance the evidence suggests that the measure is useful for making cross-cultural comparisons (cf. Hawcroft & Milfont, 2010; Vikan, Camino, Biaggio, & Nordvik, 2007).

The Value Sources of Environmental Concern measure bases environmental concern in the relative value that individuals place on themselves and their own well-being (egoistic values); other people, communities, or humanity (social-altruistic values); and plants, animals, or ecosystems (biospheric values). According to this tripartite value-basis theory of environmental concern, people act proenvironmentally based on a combination of their egoistic, altruistic, and biospheric concerns (the values are not mutually exclusive), and these concerns reflect varying levels of perceived interconnection between the self and nature (Schultz, 2001; Stern & Dietz, 1994). These values explain why people do or do not care about environmental problems; people may care because they believe such problems directly affect them (egoistic concern), other people (social-altruistic concern), or nature and ecosystems (biospheric concern).

### *Culture is Related to Environmental Concern*

Cross-national studies comparing environmental concern across countries find differences (Bechtel, Verdugo, Asai, & Riesle, 2006; Hawcroft & Milfont, 2010; Kimmelmeier, Krol, & Young, 2002; Oreg & Katz-Gerro, 2006; Schultz, 2001; Schultz et al., 2005; Schultz & Zelezny, 1999; 2003; Vikan et al., 2007). We focus here on research comparisons between Asian and western cultures due to their particular relevance to our study which contrasts European American and Asian American samples. For example, Japanese score higher than Americans on the NEP (Pierce, Lovrich, Tsurutani, & Abe, 1987).

Research also finds considerable cultural variation regarding the value bases of environmental concern when comparing different ethnicities within the same country. One study found Chinese-Canadians endorsed more social-altruistic environmental concern values than Anglo-Canadians although the two groups scored similarly on biospheric concerns (Deng, Walker, & Swinnerton, 2006). Leung and Rice (2002) found Anglo-Australians were more likely than Chinese-Australians to endorse NEP values and that this difference diminished with acculturation. Milfont et al. (2006) found that Asian New Zealanders scored higher in egoistic concern and lower on biospheric concern than did European New Zealanders. Although few studies have compared ethnic groups in the United States, those that have often find group differences. In one study, African Americans and foreign-born Latinos scored significantly lower on the NEP values than European Americans, Asian Americans, and U.S.-born Latinos (Johnson, Bowker, & Cordell, 2004). In that study, Asian Americans did not differ significantly from European Americans on the NEP.

Ethno-cultural differences in environmental concern are most frequently attributed to cultural differences in value orientations that affect environmental attitudes, and to cultural differences in environmental worldviews (Aoyagi-Usui, Vinken, & Kuribayashi, 2003; Ignatow, 2006; Johnson et al., 2004; Milfont et al., 2006; Oreg & Katz-Gerro, 2006; Schultz et al., 2005; Schultz et al., 2000). For example, research using Schwartz's (1994) values typology finds that the new ecological paradigm reflects Schwartz's self-transcendent value orientation where self and nature are interconnected and nature has inherent value; the DSP (dominant social paradigm) reflects self-enhancement values focused on goals and objects that are directly related to self (success, social power, wealth) (Schultz, 2001; Schultz et al., 2005). Likewise, values of self-transcendence tend to be positively correlated with measures of biospheric environmental concerns and negatively with egoistic environmental concerns, whereas values of self-enhancement tend to correlate negatively with biospheric concerns and positively with egoistic con-

cerns (Schultz et al., 2005). National level NEP scores have also been found to correlate positively with Schwartz's harmony values (values emphasizing a need to live harmoniously with nature) across 27 countries (Hawcroft & Milfont, 2010).

Cultural differences in individualism-collectivism are also regularly used to explain cultural differences in EC (Kim & Choi, 2005; Schultz et al., 2000). Collectivist cultures' environmental concern may be based in the potential effects of environmental destruction on the family or community whereas the concern of individualistic cultures may be based more on concerns about the personal dangers of environmental destruction (Schultz et al., 2000). The greater collectivism of Asian cultures compared to European and American ones has also been used to explain Asians' greater EC; collectivism, with a focus on other people, family, and community, is seen as more compatible with environmental concern than individualism which gives rise to egocentrism and materialism (Deng et al., 2006; Milfont et al., 2006). Asian Americans score higher in collectivism than European Americans (Coon & Kemmelmeier, 2001) and community can be an important driver of environmental action (Marcus, Omoto, & Winter, 2011). Although Asian Americans are heterogeneous as a cultural group, Kim and colleagues (Kim, Atkinson & Yang, 1999; Kim et al., 2001) found that Chinese Americans, Japanese Americans, Korean Americans, and Filipino Americans did not differ on collectivist values. The emphasis of Asian cultures on harmony with nature and the lack of demarcation between humans and nature are also contrasted with the Western cultural emphasis on the mastery of nature (Aoyagi-Usui et al., 2003; Deng et al., 2006). However, it should be noted that some authors argue that the Chinese worldview (arising from Confucianism) sees the environment as existing for the benefit of people and leads to an anthropocentric view of the environment (cf. Harris, 2006).

*Acculturation* may also affect whether differences between ethno-cultural groups within the same country are found. For example, in regards to the United States, the idea is that the longer a group or individual is in the country, the more likely it is that they adopt more individualistic, self-enhancing, American values. Consistent with this, Schultz and colleagues (2000) found differences between Latin Americans depending on level of acculturation as measured by English language proficiency; greater acculturation was associated with lessened environmental concern. Leung and Rice (2002) operationalized acculturation as English proficiency and time in the country, and found Anglo-Australians were more likely than Chinese-Australians to endorse NEP values and that this difference diminished with acculturation. Acculturation may also be domain-specific with some aspects of culture more susceptible to acculturative processes than others

(Tsai, Chentsova-Dutton, & Wong, 2002), and we do not know the extent to which environmental concern is susceptible to the acculturation process.

It is important to note that *enculturation* is common in some groups, despite English proficiency and length of residence. Kim et al. (1999) found that adherence to Asian values does not necessarily diminish with subsequent generations. Asian Americans consistently differed from European Americans on six values: collectivism, conformity, emotional self-control, family recognition through personal achievement, filial piety, and humility (Kim et al., 1999). This may mean that external, proxy indicators of acculturation such as length of residency and language proficiency may have less explanatory power in regards to cultural differences in environmental concern than more direct measures of cultural affiliation such as individuals' sense of belonging and commitment to their ethnic group (i.e., ethnic identity; Phinney & Ong, 2007). For example, Fuligni, Witkow, and Garcia (2005) found that the strength of ethnic identification made a greater contribution to academic achievement than ethnic labels.

#### *Gender is Related to Environmental Concern*

Gender is another group variable studied for its relationship to EC. Although a few studies do not find differences, most find that women score higher than men on environmental concern (Zelezny, Chua, & Aldrich, 2000). Studies using the NEP typically find that women more strongly endorse the new ecological paradigm. For example, Zelezny et al. (2000), found college women had higher NEP scores than college men in 10 of the 14 countries they surveyed (men had higher scores in three countries and there were no gender differences in one country). They also found women reported stronger environmental concern (more specifically, concern for nature, the biosphere, and all living things) in 12 of the 14 countries they studied. Likewise, Stern and Dietz (1994) reported that women had stronger biospheric and social-altruistic environmental values. Schultz (2001) found women to score higher on all three value bases of environmental concern.

Researchers most often attribute gender differences in environmental concern to value differences arising from traditional gender socialization (Blocker & Eckberg, 1997; Dietz, Kalof, & Stern, 2002; Stern, Dietz & Kalof, 1993; Zelezny et al. 2000). The reasoning is that females are more likely to be socialized to be communal and other-centered (which is more consistent with values of self-transcendence related to environmentalism), while males are socialized to be agentic and competitive (which is more consistent with self-enhancement values contrary to environmentalism). Zelezny et al. (2000) found that compared to men, women have a greater ability to take on the view of a "conceptualized

other,” and evidenced stronger levels of social responsibility. Likewise, Dietz et al. (2002) found American women to score higher than American men in the value placed on altruism (i.e., self-transcendence), the value most associated with environmentalism. They attribute this pattern to differential gender socialization and life experiences.

As suggested by the notion of intersectionality, the effects of gender on EC (and on environmental behavior) may also differ based on culture. *Intersectionality* in regards to gender is the idea that the influence of gender varies based on how it interacts with other social categories and identities including ethnicity, class, nationality, and region (see Warner, 2008 for a discussion of intersectionality in psychological research). For example, due to cultural differences in traditional socialization, we might expect greater gender differences where traditional gender roles are the norm and smaller ones where gender roles are more equal. Where women are the primary cultivators and gatherers of food, water, and fuel for family consumption, we might also expect greater gender differences in environmental concern. In developing nations, women are often the first environmental activists because traditional gender roles put them in direct contact with the natural environment (as water gatherers and subsistence farmers) such that environmental degradation directly affects their daily activities and their family's health and well-being (Burn, 2011; Dobash & Seager, 2001).

#### *Study Rationale*

Our study was intended to add to previous research on ethno-cultural and gender differences in environmental concern. We compared Asian American women and men and European American men and women on the NEP and the three value bases of environmental concern (biospheric, altruistic, and egoistic).

Unlike past research on ethnicity and environmental concern that used proxy measures of acculturation, we examined the role of ethnic identity. Ethnic identity is a sense of membership in an ethnic group along with attitudes and feelings toward that membership (Phinney & Ong, 2007). Simply put, ethnic identity may moderate the influence of ethnicity on environmental concern, because when ethnic identity is high, ethno-cultural values are more likely to be internalized as part of the self thereby impacting attitudes, values, and behaviors. More specifically, we suspected that intra-country ethno-cultural differences in EC may be greater when ethnic identification is high. Our approach additionally offered the chance to explore the relationship between European-American or White ethnic identity and environmentalism, an area that has received little attention (Tsai et al., 2002).

We also studied the relationship between gender and en-

vironmental concern. The relationship between gender and environmentalism is likely a dynamic one that may change over time as a country progresses towards gender equality. Indeed, there are many areas in which gender differences have declined due to the decline of traditional gender roles. This means that the relationship between gender and environmental attitudes and behaviors should be regularly revisited by researchers for evidence of change.

The relationship between gender and environmental concern has also tended to isolate gender without considering that the influence of gender may depend on other “intersectional” variables such as ethnicity, class, nationality, and region. In the case of gender and environmental concern, most of the research was conducted over a decade ago and the intersection of gender and culture is unexplored. Studies examining gender differences in the value basis of environmental concern and the role of acculturation on intra-country ethnic differences in environmental concern are few (exceptions: Johnson et al., 2004; Schultz et al., 2000; Stern & Dietz, 1994) and we found only one study that compared European Americans and Asian Americans on environmental concern and examined gender as an intersectional variable (Johnson et al., 2004); that study used only the NEP to assess environmental concern.

#### *Study Hypotheses*

*H1:* In alignment with the majority of reported findings contrasting Asian and western samples, we tentatively predicted that Asian Americans would score higher on the NEP than European Americans.

*H2:* We expected Asian Americans to score higher on social-altruistic EC values than European Americans. We also expected Asian Americans to have greater biospheric EC values and European Americans to have higher egoistic values. Alternatively, we thought we might find that Asian Americans score higher on the egoistic EC value base if the Asian American value of “family recognition through achievement” manifests as egoistic concern.

*H3:* We tentatively hypothesized that for Asian Americans, ethnic identity would be positively correlated with biospheric and social-altruistic value bases of environmental concern. Although there is a paucity of research on ethnic identity in European Americans (see Tsai et al., 2002), we tentatively expected that for European Americans, ethnic identification would be positively correlated with egoistic sources of concern due to values of individualism which give rise to egocentrism and materialism.

*H4:* Because most studies comparing women and men on the NEP found that women scored higher than men, we expected the same. We also examined the possibility of a gender by ethnicity interaction since the influence of gender

on environmental concern may vary based on culture due to differences in gender socialization and roles.

*H5:* We predicted that women would score higher than men on egoistic, social-altruistic, and biospheric concern than men. A gender by ethnicity interaction was also investigated.

## Method

### Participants

Participants were 226 Asian Americans and 321 European Americans who responded to an online questionnaire (respondents who did not fall into either of these two self-identified categories were not included in analyses). Participants were from 29 different American states representing all regions, although the majority resided in the state of California (86.2%). Internet samples are increasingly common. This is because data from internet surveys is comparable to traditional methods and boosts sample diversity (Denscombe, 2006; Gosling, Vazire, Srivastava, & John, 2004; Kraut et al., 2004). Although our internet sample was not random, it increased age diversity and allowed us to "oversample" Asian American participants, which was important to our study.

For the Asian American sample of 157 women and 69 men, age ranged from 16 to 75 with a mean of 32.88 (standard deviation = 16.60). Education levels were fairly high (40.3% reported having completed some college, 5.3% an Associate's degree, 38.5% a bachelor's degree, and 9.8% a Master's or doctorate). The majority of the self-identified Asian American sample said their "primary ethnic identity" was Japanese or Japanese American (43.1%), 16.2% identified as Chinese or Chinese American, 4.0% as Filipino, 3.0% as Vietnamese, 1.3% as Korean or Korean American, .4% as Laotian, .4% as Cambodian, and .9% as Indian American (26% declined to state a primary ethnic identity).

The European American sample of 222 women and 99 men ranged in age from 17 to 84 with a mean of 31.57 (standard deviation = 15.19), and was also relatively well-educated (40.3% reported having completed some college, 8% an Associate's degree, 31.1% a bachelor's degree, and 15.4% a Master's or doctorate). Although a majority of self-identified European Americans declined to state a primary ethnic identity (52.6%), of those that did, 27% identified themselves as European American, Caucasian, White, American, or "American White." The remainder of the European American sample included a variety of primary ethnic identities including Austrian, Croatian, Dutch, French/English, German, Irish, Italian, Jewish, Polish, Portuguese, Scottish, and Swiss with the largest percentages identifying as Irish American (3.3%), Italian American (3%), and German American (3%). Asian Americans and European Americans did not differ on educa-

tion,  $t(503) = .92, p = .36$ , or age,  $t(543) = -5.26, p = .60$ .

### Questionnaire

The online questionnaire included an informed consent, demographic items, and measures of ethnic identity and environmental concern.

*Value Sources of Environmental Concern.* The value sources of environmental concern measure (Schultz, 2000) consists of 12 environmental concern items rated with a 10-point scale anchored by "not at all important" (1) to "supreme importance" (10) with a "neutral" (5) midpoint. The measure begins with the prompt: "I am concerned about environmental problems because of the consequences for..." Four items measured each source of environmental concern: biospheric (birds, animals, plants, and trees), egoistic (my health, my lifestyle, my prosperity, and my future), and social-altruistic (future generations, people in the community, children, and humanity). Internal reliabilities (Cronbach's alphas) for this sample were .89 (egoistic), .85 (social-altruistic), and .92 (biospheric).

*New Ecological Paradigm Scale (NEP).* The 15-item revised NEP (Dunlap et al., 2000) uses a 5-point Likert scale to measure endorsement of an ecological worldview. Three items measure each of five facets: reality of limits to growth (e.g., "We are approaching the limit of the number of people the earth can support"); rejection of exemptionalism (e.g., "Human ingenuity will ensure that we do NOT make the earth unlivable"); integrity of nature's balance (e.g., "The balance of nature is delicate and easily upset"); possibility of eco-crisis (e.g., "If things continue on their present course, we will soon experience a major ecological catastrophe"); and antianthropocentrism (e.g., "Plants and animals have as much right as humans to exist"). We used the NEP as a unidimensional measure because this is customary and because internal reliability for some subscales was unacceptably low (see Hawcroft & Milfont, 2010). For our sample, internal reliability (Cronbach's alpha) for the NEP was .83.

*Multigroup Ethnic Identity Measure (MEIM-R).* The revised MEIM (Phinney & Ong, 2007) is a 6-item, 5-point Likert scale measure designed to assess ethnic identity across diverse ethnic groups. It includes two subscales, one measuring ethnic identity exploration (e.g., "I have often done things that will help me understand my ethnic background better") and another measuring ethnic identity commitment, which we used to measure ethnic identity. It includes three items: "I have a strong sense of belonging to my own ethnic group"; "I understand what my ethnic group membership means to me"; and "I feel a strong attachment towards my own ethnic group". For our sample the subscale alpha was .88. As recommended by Phinney and Ong (2007), the measure was immediately preceded by an open-ended question that elicits a

"spontaneous ethnic self-label" (following a closed-ended ethnicity item, they were asked to provide their "primary ethnic identity e.g., Mexican-American, Filipino, Persian, etc.")).

### Procedure

After gaining approval from the university's ethical review board, the first author contacted professors of general education courses explaining that she was conducting a study on ethnicity and environmental attitudes and asking if they would be willing to ask their students to complete an online survey. Three ethnic studies professors, a social psychology professor, and a multicultural psychology professor provided the survey as an extra credit opportunity to their students. The study was also posted as a choice for students in the introductory psychology research pool. Additionally, four undergraduate research assistants (one Japanese American, one Vietnamese American, and two European Americans) and the first author requested that friends, family, and coworkers complete and distribute the survey link via email or Facebook. We recognize that our approach did not yield a representative sample of Asian Americans and European Americans residing in the U.S., however it provided an opportunity to explore relationships between environmental concern, ethnic identity, and gender and to compare the two ethnic groups using these variables.

## Results

Cases were excluded from analyses using variables for which data was missing. Consequently, the number of cases varied depending on the analysis. Some NEP item scores were reversed so that higher item scores were always indicative of greater NEP endorsement; MEIM-R Commitment scores were reversed such that higher scores indicated greater ethnic identity. Mean NEP, MEIM-R Commitment scores, and means for the three value bases of concern were then computed for use in hypothesis testing. See Table 1 for means and standard deviations of the main study variables.

Ethnic and gender differences on the NEP were tested with a 2 (ethnicity) x 2 (gender) between-subjects ANOVA with the NEP as the dependent variable. Contrary to *H1*, Asian Americans and European Americans did not significantly differ on the NEP,  $F(1, 151) = 1.87, p > .05$ . Moreover, *H4* was also unsupported as there was no significant gender difference on the NEP,  $F(1, 151) = 2.16, p > .05$ . The ethnicity by gender interaction was not significant,  $F(1, 151) = .23, p > .05$ .

A 2 (ethnicity) x 2 (gender) MANOVA with the three value bases of environmental concern as dependent variables was used to test *H2* and *H5*. There were statistically significant multivariate effects for ethnicity, Wilks'  $\lambda = .94, F(3,$

Table 1. Environmental Concern Means and (Standard Deviations) by Gender and Ethnicity

|                       | Value Sources of Environmental Concern |     |                   |             |             |
|-----------------------|----------------------------------------|-----|-------------------|-------------|-------------|
|                       | NEP                                    | n   | Social-Altruistic | Biospheric  | Egoistic    |
| 1. Asian Americans    | 3.94 (.40)                             | 49  | 8.71 (1.39)       | 7.57 (1.66) | 8.23 (1.95) |
| Women (143)           | 3.99 (.42)                             | 37  | 8.91 (1.09)       | 7.74 (1.40) | 8.44 (1.37) |
| Men (59)              | 3.78 (.32)                             | 12  | 8.24 (1.87)       | 7.16 (2.13) | 7.75 (2.05) |
| 2. European Americans | 4.05 (.59)                             | 106 | 8.48 (1.50)       | 7.71 (1.69) | 7.56 (1.77) |
| Women (201)           | 4.08 (.57)                             | 67  | 8.73 (1.37)       | 8.02 (1.51) | 7.73 (1.73) |
| Men (86)              | 3.98 (.62)                             | 39  | 7.91 (1.64)       | 6.98 (1.86) | 6.93 (1.81) |
| 3. Gender (Combined)  |                                        |     |                   |             |             |
| Women (344)           | 4.05 (.52)                             | 104 | 8.80 (1.26)       | 7.91 (1.47) | 8.02 (1.63) |
| Men (145)             | 3.93 (.57)                             | 51  | 8.05 (1.73)       | 7.06 (1.97) | 7.26 (1.95) |

Notes: NEP items were rated with a 5-point Likert scale. A 10-point scale anchored by 1 (not at all important) and 10 (supreme importance) was used to rate value sources of environmental concern items. Higher scores are indicative of greater environmental concern. Sample sizes for the environmental concern variables are indicated in parentheses next to groups.

483) = 8.83,  $p < .001$ , and gender, Wilks'  $\lambda = .93, F(3, 483) = 10.88, p < .001$ , but there was no statistically significant ethnicity x gender interaction, Wilks'  $\lambda = .995, F(3, 483) = .77, p > .05$ . Supporting *H5*, subsequent univariate tests of the MANOVA with Bonferroni corrections showed that women scored significantly higher than men on egoistic sources,  $F(1, 485) = 18.80, p < .0001$ , biospheric sources,  $F(1, 485) = 24.03, p < .0001$ , and social-altruistic sources,  $F(1, 485) = 26.91, p < .0001$ .

According to *H2*, Asian Americans were expected to more greatly endorse biospheric and social altruistic environmental values, and European Americans were expected to endorse more egoistic values, although some research suggests that Asian Americans might score higher on the egoistic EC value base. Univariate tests with Bonferroni corrections (after the MANOVA described above) found that Asian Americans did not differ significantly from European Americans on biospheric and social-altruistic EC values,  $ps > .05$ , although they scored higher than European Americans on egoistic sources of concern,  $F(1, 485) = 19.92, p < .001$ .

*H3*, which predicted that ethnic identity would be positively correlated with biospheric and social-altruistic value bases of environmental concern for Asian Americans, and positively correlated with egoistic sources of concern for European Americans, was partially supported (we say "partially" due to  $rs < .3$ ; see Cohen, 1988). Table 2 shows the correlations for ethnic identity and value bases of environmental concern for each ethnic group. In order to keep false discovery rate under control, the Benjamini-Hochberg (1995) procedure was used. Although these correlations are fairly low, a test of independent correlations indicated that the correla-

Table 2. Environmental Concern Correlations with Ethnic Identity

| Variables             | 1     | 2     | 3     | 4    |
|-----------------------|-------|-------|-------|------|
| 1. Egoistic Concern   | —     | .63** | .52** | .06  |
| 2. Altruistic Concern | .61** | —     | .71** | .24* |
| 3. Biospheric Concern | .45** | .67** | —     | .23* |
| 4. EI Commitment      | .30** | .10   | .11   | —    |

Notes. Coefficients above the diagonal (italicized for readability) are for Asian Americans (ns ranged from 126-209) and coefficients below are for European Americans (ns ranged from 114-298).

\* $p < .05$  \*\* $p < .01$

tion between ethnic commitment and egoistic EC values was higher for European Americans than for Asian Americans,  $z = 1.98$ ,  $p < .048$ .

Also supporting  $H3$  were separate standard multiple regressions for European Americans and Asian Americans predicting ethnic identity commitment from the three value bases of environmental concern. As shown in Table 3, for European Americans, the three environmental factors predicted MEIM commitment although only egoistic values contributed significantly to the overall model. For Asian Americans, the overall model was statistically significant; however, none of the predictors individually significantly contributed to the overall model.

## Discussion

Environmental sustainability may require embracing a new ecological paradigm. To better inform the marketing of sustainability, more research is needed to identify reliable ethnic and gender differences in the environmental attitudes that influence proenvironmental behavior. Such differences may be relevant to the marketing of environmental sustainability to address climate change and other environmental risks.

Unlike past research, we did not find men and women, or Asian Americans and European Americans to differ on the

NEP. Furthermore, our NEP means were higher than those reported in past studies (see Hawcroft & Milfont's, 2010 meta-analysis). We are hopeful that this finding reflects a greater awareness of human impacts on the environment due to recent, increased media attention to environmental issues such as climate change and progress towards the adoption of a new ecological paradigm. It also underscores the importance of replicating EC studies since EC is a dynamic attitude influenced by changing contextual factors. Of course, a sampling bias is a possible explanation for these findings; those who care more about the environment may have been more likely to complete our survey. It could also be a reflection of our relatively educated sample (past research finds educated samples to score higher on the NEP).

Other study results support past research findings that culture affects environmental values. Although our Asian American and European American samples did not differ on the NEP, Asian Americans scored higher than European Americans on egoistic environmental values. This may reflect the Asian American value of "family recognition through individual achievement" identified by Kim et al. (2005); in other words, the "egoism" of Asian Americans may have its own distinctive flavor that reflects collectivist values. We also found that for Asian Americans, ethnic identity commitment (a sense of belonging and attachment to one's ethnic group) was related to greater altruistic and biospheric environmental values while for European Americans it was associated with greater egoistic values. In short, it appears that stronger ethno-cultural identities amplify cultural influences on environmental values.

Our findings also suggest that gender is relevant to environmental attitudes and behavior. Like Schultz (2001), we found that women scored higher than men on all three value bases of environmental concern, but unlike past research, the genders didn't differ on the NEP. In short, women in our sample are more concerned about environmental problems than men due to potential impacts on others, the biosphere, and themselves. We cannot say whether these differences are due to gender socialization and gendered roles but we can say that more research is needed. Despite the historically important role women have played in environmental movements (cf. Zelezny & Bailey, 2006; Burn, 2011), there are relatively few articles on gender and the environment in environmental sociology, environmental psychology, or feminist psychology journals. This matters, because, as MacGregor (2010) suggests, it has resulted in a focus on technological and scientific climate change solutions consistent with hegemonic masculinity. It also matters because of the central role women play in the adoption of private sphere (home) sustainability behaviors and practices (cf. Tindall, Davies, & Mauboules, 2003).

Table 3. Multiple Regression Analysis with MEIM Commitment as the Dependent Variable and the Three Value Bases of Environmental Concern as the Independent Variables

|               | Asian Americans<br>(n = 146) |       |         |      |      | European Americans<br>(n = 113) |       |         |      |      |
|---------------|------------------------------|-------|---------|------|------|---------------------------------|-------|---------|------|------|
|               | B                            | SE(B) | $\beta$ | F    | Sig. | B                               | SE(B) | $\beta$ | F    | Sig. |
| Altruistic    | .102                         | .069  | .181    | 2.18 | >.05 | -.074                           | .103  | -.098   | .52  | >.05 |
| Biospheric    | .070                         | .051  | .160    | 1.88 | >.05 | .034                            | .084  | .051    | .16  | >.05 |
| Egoistic      | -.053                        | .044  | -.117   | 1.46 | >.05 | .240                            | .077  | .342    | 9.62 | .003 |
| Overall $R^2$ | .074, $p < .013$             |       |         |      |      | .101, $p < .01$                 |       |         |      |      |

### Study Limitations

Our internet sample provided a more age and ethnically diverse sample than we would have achieved otherwise. However, our sample was not representative of European American and Asian American populations and when using small convenience samples, we must be especially cautious in assuming that results reflect true cross-cultural differences (van de Vijver & Leung, 2000). Our small sample also precluded comparison of different Asian American groups yet Asian Americans come from a variety of Asian cultures, quite possibly with different ecological paradigms and the values that underlie them.

### Conclusions

Given the great ethno-cultural diversity in the United States, it is plausible that environmental messaging campaigns should appeal to a variety of environmental value bases. For European Americans with a strong ethnic identity, messages appealing to egoistic values may be more effective and for Asian Americans with a strong ethnic identity, appeals to social altruistic and biospheric values may be more effective. However, for all groups, the social-altruistic EC value means were higher than all others, suggesting that when "one-size fits all" approaches are used, a focus on how the recommended action serves social-altruistic EC values may be the way to go. Our findings also suggest that more attention should be paid to the role of women in the promotion of sustainability since they tend to score higher on the environmental values that underlie environmental action. Furthermore, ongoing research on environmental concern appears important since it is a dynamic attitude influenced by changing contextual factors.

Ideally, future researchers will use large, representative samples to document gender and ethnic group differences and their intersection, directly study the cultural and contextual factors that may explain group differences, and provide information useful for the effective design of interventions aimed at increasing environmental responsibility in a diverse society. Hopefully, such research will be paired with qualitative studies to further inform our understanding of the nuanced intersections of gender, ethnic identity, and environmental attitudes and identities, and their impacts on proenvironmental behavior.

### Endnote

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