

## **Elaborating on Gender Differences in Environmentalism**

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*A review of recent research (1988 to 1998) on gender differences in environmental attitudes and behaviors found that, contrary to past inconsistencies, a clearer picture has emerged: Women report stronger environmental attitudes and behaviors than men. Additional evidence of gender differences in environmental attitudes and behaviors was also supported across age (Study 1) and across 14 countries (Study 2). As a single variable, the effect of gender on proenvironmental behavior was consistently stronger than on environmental attitudes. Explanations for gender differences in environmentalism were examined in Study 3. It was found that compared to males, females had higher levels of socialization to be other oriented and socially responsible. Implications for theory, social action, and policy are discussed.*

One of the ways psychologists can promote environmentalism is to understand the relationship between demographic variables and environmental attitudes and behaviors and the implications these human-environment relationships may have on theory, social action, and policy. Numerous studies have examined the relationship between demographic variables (e.g., age, education, ethnicity, socioeconomic status) and environmental attitudes and behaviors. Research on

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environmentalism and gender has been somewhat limited, however, and “surprisingly little has been done to examine the . . . environmental activity of women and factors related to it” (Mohai, 1992, p. 2).

Two recognized reviews of gender difference in environmental attitudes and behaviors conducted more than a decade ago (Hines, Hungerford, & Tomera, 1986–87; Van Liere & Dunlap, 1980) concluded that research on the relationship between these variables is meager and inconsistent. In concurrence, Mohai (1992) stated that “no firm conclusions can be drawn about the effects of gender on concern about general environmental issues, and more analysis and explanation clearly needs to be done in this area” (p. 2).

### **Review of Literature on Gender Differences and Environmentalism**

To elaborate on these past findings, we surveyed a decade of research, from 1988 to 1998, on gender and environmental attitudes and behaviors since Hines et al.’s (1986–87) meta-analytic review. We found that numerous studies ( $n = 32$ ) had recently been added to the literature. We focused primarily on published studies that had measured environmental attitudes and/or behaviors. Most studies that examined gender and environmental attitudes typically measured environmental attitudes using a single item (e.g., Blocker & Eckberg, 1989, 1997; Mohai, 1992); however, a few ( $n = 6$ ) included the New Environmental Paradigm (NEP) Scale (Dunlap & Van Liere, 1978; Dunlap, Van Liere, Mertig, & Jones, 2000). Our review focused on the six studies that used the NEP to measure environmental attitudes (i.e., Arcury, 1990; Arcury & Christianson, 1990, 1993; Blaikie, 1992; Maineri, Barnett, Valdero, Unipan, & Oskamp, 1997; Widegren, 1998). Descriptive analyses showed that four of the six studies found that females expressed significantly greater (NEP) environmental concern than males (Arcury, 1990; Arcury & Christianson, 1990; Blaikie, 1992; Maineri, Barnett, Valdero, Unipan, & Oskamp, 1997), whereas two of the of six studies found no significant difference between males and females on (NEP) environmental concern (Arcury & Christianson, 1993; Widegren, 1988); no study found that males had significantly greater NEP environmental concern than women. Using meta-analytic techniques across the six studies mentioned above, the calculated effect of gender on NEP environmental attitudes was  $r = .07$ . Thus, it was concluded that the majority of studies from 1988 to 1998 found that women reported significantly more general environmental concern than men, although the effect of gender on NEP environmental attitudes was small.

In terms of gender and environmental behavior we identified 13 studies published since Hines et al.’s 1987 review (i.e., Arcury & Christianson, 1993; Arp & Howell, 1995; Baldassare & Katz, 1992; Blocker & Eckberg, 1997; Maineri, Barnett, Valdero, Unipan, & Oskamp, 1997; Mohai, 1992; Roberts, 1993; Schahn & Holzer, 1990; Steel, 1996; Stern, Dietz, & Kalof, 1993; Stern, Dietz, Kalof, &

Guagnano, 1995; Widegren, 1998; Wolkomir, Futreal, Woodrum, & Hoban, 1997). Of these 13 studies, 9 found that women reported significantly more participation in proenvironmental behaviors than men (Baldassare & Katz, 1992; Maineri, Barnett, Valdero, Unipan, & Oskamp, 1997; Roberts, 1993; Schahn & Holzer, 1990; Steel, 1996; Stern, Dietz, & Kalof, 1995; Stern, Dietz, Kalof, & Guagnano, 1995; Widegren, 1998; Wolkomir, Futreal, Woodrum, & Hoban, 1997); 3 of the 13 studies found no significant difference between males and females on proenvironmental behavior (Arcury & Christianson, 1993; Arp & Howell, 1995; Blocker & Eckberg, 1997); and 1 of the 13 studies found that males reported significantly greater participation in proenvironmental behavior (Mohai, 1992). Thus, the majority of studies in the last decade found that, compared to men, women reported greater participation in proenvironmental behavior/activism. Meta-analytic techniques were also utilized here to clarify the relationship between gender and proenvironmental behaviors. Across these studies it was found that the effect of gender on proenvironmental behavior was  $r = .10$ .

### Why Are Females More Environmental?

A variety of theories have been used to explain gender differences in environmentalism. One widely used approach is based on gender roles and socialization (Eagly, 1987; Howard & Hollander, 1996; Miller, 1993; Unger & Crawford, 1996; Wilkinson & Kitzinger, 1996). Socialization theory posits that behavior is predicted by the process of socialization, whereby individuals are shaped by gender expectations within the context of cultural norms. Females across cultures are socialized to be more expressive, to have a stronger “ethic of care,” and to be more interdependent, compassionate, nurturing, cooperative, and helpful in caregiving roles (Beutel & Marini, 1995; Chodorow, 1974; Eagly, 1987; Gilligan, 1982). On the other hand, males are socialized to be more independent and competitive (Chodorow, 1974; Gilligan, 1982; Keller, 1985).

Theoretically, gender differences in environmentalism imply links between socialization and values (Stern, Dietz, & Kalof, 1993). As guiding principles, values (Rokeach, 1973) predict attitudes and behaviors (Olson & Zanna, 1994); therefore, because females, compared to males, are socialized to value the needs of others, women exhibit more helping behavior and altruism (Gilligan, 1982).

Individuals who help possess an “other” value orientation according to Schwartz’s (1968, 1977) norm activation model. This model suggests that helping behavior is most likely to occur when individuals are aware of harmful consequences (awareness of consequences—AC) and of their actions and feel responsible for these consequences (ascribed responsibility—AR). Schwartz’s norm activation model has been applied to the environmental domain to explain proenvironmental behavior (Schultz & Zelezny, 1998; Black, Stern, & Elworth, 1985; Heberlein & Black, 1976; Hopper & Nielson, 1991; Stern, Dietz, & Black,

1986; Van Liere & Dunlap, 1978). Because proenvironmental behavior is a special kind of helping, however, other value orientations may underlie helping the environment (i.e., ecological value orientation; Stern, Dietz, & Kalof, 1993). Ecological value orientation is defined as the expression of motivational concern for environmental issues based upon an individual's conception of humanity's relationship to the environment (Thompson & Barton, 1994). Stern and Dietz (1994) proposed a tripartite classification of ecological value orientations: concern for self, concern for other human beings, and concern for the biosphere. Thus, individuals may act proenvironmentally but they may have different values. For example, individuals may protest agricultural pollution (e.g., spraying pesticides) because it affects the air they breathe (i.e., egocentric orientation) or because it affects the air their children breathe (i.e., anthropocentric orientation) or because it affects the ecosystem (i.e., ecocentric orientation). Stern, Dietz, and Kalof (1993) proposed that individuals may have environmental attitudes that reflect a combination of these three value orientations. They found that women have stronger beliefs about the harmful consequences of poor environmental conditions for others, the biosphere, and self and that these beliefs predicted more proenvironmental behavior (Stern, Dietz, & Kalof, 1993).

For this article, we were particularly interested in ecocentrism, which is a fundamental belief in the inherent value of nature, the biosphere, and all living things. By definition ecocentrism suggests an extended "other" orientation, which, according to gender socialization theory, is characteristic of feminine socialization. Numerous studies have found that gender socialization significantly influences individual behavior very early in life, and these findings have been supported across cultures (Block, 1973; Williams & Best, 1990). In a recent study on gender and the environmental risk concerns, however, Davidson and Freudenberg (1996) suggested that gender differences in environmentalism are not universal. Therefore, we wondered whether gender differences in environmentalism could be found in children and across countries. The two studies reported below address these issues.

First, in Study 1, we examined gender differences in environmental attitudes and behaviors among primary and secondary school children. Based on socialization theory, we predicted that, compared to males, female students in primary and secondary schools would report significantly stronger environmental attitudes and greater participation in proenvironmental behaviors. Study 2 examined gender differences in environmental attitudes and behaviors across 14 countries to test Davidson and Freudenberg's (1996) conclusions that gender differences in environmentalism are not universal.

Based on the aforementioned socialization framework and past research on other versus self-orientation, we derived three hypotheses. First, we predicted that females across countries would report significantly stronger environmental attitudes as measured by the NEP. Secondly, we predicted that females across

countries would report stronger value-based ecocentric environmental attitudes than males. Third, we predicted that females across countries would report greater participation in proenvironmental behaviors than males.

### Study 1: Gender Differences in Environmentalism Among Children

A stratified sample of primary and secondary school students ( $N_{1994} = 584$ ;  $N_{1995} = 709$ ) from diverse socioeconomic strata in California were systematically surveyed over a 2-year period.

A 35-item questionnaire was designed to assess students' (1) general environmental attitudes (measured by separate items and an adapted NEP Scale; Dunlap & Van Liere, 1978), (2) self-reported knowledge about the environment, (3) feelings of personal responsibility for improving the environment, (4) specific environmental attitudes, (5) specific recycling attitudes, (6) interest and intention to participate in school recycling, (7) participation in school recycling after the initiation of district-wide school recycling (1995 survey only), and (8) demographic characteristics. The questionnaire included both closed-ended questions ( $n = 32$ ) and open-ended questions ( $n = 3$ ). The closed-ended questions, designed by the current authors, included 6-point Likert-type response scales (e.g., in response to question 6, "How would you rate your overall personal responsibility to improve the environment?" the response choices were 1—*Extremely responsible*, 2—*Very responsible*, 3—*Somewhat responsible*, 4—*Slightly responsible*, 5—*Not at all responsible*, and 6—*I don't know*).

The survey was pilot tested twice on elementary school students to revise the wording of the survey items so that they were appropriate for children. In the pilot testing, half of the items from the full 12-item scale of the NEP (Dunlap & Van Liere, 1978) were not understood by younger elementary students, and those items were not included in the final questionnaire. A shortened six-item NEP Scale assessed students' general environmental concern using the following items: (1) The balance of nature is very delicate and easily upset; (2) People must live in harmony with nature in order to survive; (3) Pollution is not personally affecting my life; (4) Courses focusing on conservation of natural resources should be taught in the public schools; (5) Although there is contamination of our lakes, streams, and air, nature will soon return them to normal; and (6) Because government rules are so effective, it is not likely that pollution will become too bad. The shortened NEP included Likert response choices as follows: (1) *Strongly agree*, (2) *Agree*, (3) *No opinion*, (4) *Disagree*, and (5) *Strongly disagree*. It was also determined, because of the reading level required to adequately comprehend this questionnaire, that the minimum grade level of students in the study would be fifth grade.

The reliabilities of the student environmental questionnaire were assessed separately using the 1994 and 1995 data. The reliability coefficients ranged from alpha .87 to .88 on all self-designed environmental questions and the shortened

NEP and from alpha .71 to .72 on the shortened NEP scale, across the 2 years. The reliability coefficients for this questionnaire remained relatively stable across ages, schools, ethnicities, gender, and socioeconomic status; the most consistent responses for these particular environmental items, however, came from Anglo high school students of middle or high socioeconomic status.

The relationships between students' demographic characteristics (e.g., age and gender) and their general environmental concern, specific environmental attitudes, and participation in school recycling were analyzed. The environmental attitudes and behaviors of girls and boys were compared by year, as shown in Table 1. In addition, the effect of gender on NEP attitudes and proenvironmental behavior was assessed using effect size ( $r$ ) calculations (see Table 2). Finally, gender differences in concern about specific environmental issues—air pollution, animal extinction, cutting down trees, wasting energy, water pollution, and trash in the environment—were qualitatively compared by year.

In 1994, with regard to general attitudes, girls reported significantly stronger overall concern about the environment than boys. Further, girls reported significantly stronger general environmental concerns than boys on the NEP and more personal responsibility to improve the environment. In terms of specific attitudes, girls expressed greater proenvironmental attitudes than did boys on concern about trash, interest in recycling, and interest in school recycling. Finally, girls reported stronger intentions to participate in school recycling than did boys (see Table 1).

In 1995, the pattern was identical. Girls reported stronger overall concern for the environment, general NEP environmental concern, and personal responsibility

**Table 1.** Comparison of Girls and Boys on Environmental Attitudes and Behavior, by Year

DV	Girls	Boys	<i>F</i> ratio
	$n_{1994} = 303$ $n_{1995} = 353$	$n_{1994} = 260$ $n_{1995} = 337$	
Q3. Self-rated environmental concern	3.49 <b>3.36</b>	3.27 <b>3.13</b>	7.00** <b>8.81**</b>
Q6. Self-rated personal responsibility to improve the environment	3.34 <b>3.25</b>	3.07 <b>2.91</b>	8.63** <b>17.85**</b>
Q12. Concern about trash	4.11 <b>4.07</b>	3.81 <b>3.76</b>	12.39** <b>14.22**</b>
Q14. Interest in recycling	3.94 <b>3.85</b>	3.72 <b>3.69</b>	8.11** <b>4.47**</b>
Q21. Interest in school recycling	4.21 <b>3.90</b>	3.95 <b>3.61</b>	11.04** <b>14.60**</b>
Q22. Participation in school recycling	3.88 <b>3.31</b>	3.48 <b>2.91</b>	17.25** <b>15.92**</b>
NEP Scale	22.93 <b>22.68</b>	21.94 <b>21.52</b>	8.95** <b>13.46**</b>

Note: 1994 means are the upper values in each cell. 1995 means are the lower values in each cell and are in boldface.

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

**Table 2.** Comparison of Gender Effects (Female) on NEP Environmental Attitudes and Proenvironmental Behaviors, by Study

Study	Variable	Effect size ( <i>r</i> )
Review of studies 1988–1999	NEP environmental attitudes	<i>r</i> = .07
Study 1 Schoolchildren 1994	NEP environmental attitudes	<i>r</i> = .13
Schoolchildren 1995		<i>r</i> = .14
Study 2 University students in 14 countries	NEP environmental attitudes	<i>r</i> = .04
Study 2 University students in 14 countries	Ecocentric environmental attitudes	<i>r</i> = .10
Review of studies from 1988–1999	Proenvironmental behaviors	<i>r</i> = .10
Study 1 Schoolchildren 1994	Proenvironmental behaviors	<i>r</i> = .18
Schoolchildren 1995		<i>r</i> = .15
Study 2 University students in 14 countries	Proenvironmental behaviors	<i>r</i> = .09

for improving the environment than boys. Further, girls reported stronger concern about trash, interest in recycling, and interest in school recycling. Finally, girls reported significantly more participation in school recycling (see Table 1).

The effect sizes of gender on environmental variables were calculated using the results from Study 1. The effect of gender on environmental attitudes as measured by the NEP ranged from  $r = .13$  to  $r = .14$  (see Table 2). The effect of gender on proenvironmental behaviors ranged from  $r = .18$  to  $r = .15$  (see Table 2).

Qualitatively, with regard to specific environmental issues, girls reported in both 1994 and 1995 that the issue that they cared the most about was animal extinction. Boys, however, reported in 1994 that their top concern was animal extinction, whereas in 1995, they reported that they were most concerned about water pollution. On the other hand, girls and boys consistently reported, across both years, that they were least concerned about wasting energy.

In summary, compared to boys, girls reported stronger proenvironmental responses on all environmental variables in this study, and this pattern was consistent across 2 years (see Table 1).

The findings in Study 1 strongly suggest that environmentalism does not begin in adulthood, thus debunking the argument that gender differences in environmentalism arise with motherhood and protecting children from environmental threats (Hamilton, 1985a; Levine, 1982). Study 1's findings are consistent with the adult studies that were reviewed earlier in this article. Females, regardless of age (i.e.,

youth or adult) reported more concern for the environment and proenvironmental behaviors than males. Also, identical patterns emerged with respect to effect sizes. In both adults and youth, the effect of gender (female) was stronger on pro-environmental behaviors than NEP environmental concerns (see Table 2).

We are careful to note the limitations of our investigation. We did not directly compare the environmental attitudes and behaviors of children and adults, nor did we examine environmental attitudes and behaviors longitudinally within individuals. Future research is needed to understand the development of environmentalism, the stability of environmentalism across the life span, the interaction between age and gender on environmental attitudes and behaviors, and how environmentalism is related to cognitive, moral, and social development. Finally, research on gender differences and environmentalism is needed to address the generalizability and the universality of these findings.

Hence, in response to the recommendations presented in Study 1, we report data from a study to examine the universality of gender differences and environmentalism across countries.

## **Study 2: Gender Differences in Environmentalism Across 14 Countries**

English- and Spanish-speaking students ( $n = 2,160$ ) from Europe, Latin America, and the United States were contacted via professors and administrators from universities throughout the world. All students were undergraduates participating in a social or behavioral studies course in the following 14 countries: Argentina ( $n = 54$ ), Canada ( $n = 96$ ), Colombia ( $n = 149$ ), Costa Rica ( $n = 213$ ), the Dominican Republic ( $n = 121$ ), Ecuador ( $n = 201$ ), El Salvador ( $n = 194$ ), Mexico ( $n = 65$ ), Panama ( $n = 100$ ), Paraguay ( $n = 200$ ), Peru ( $n = 224$ ), Spain ( $n = 104$ ), the United States ( $n = 245$ ), and Venezuela ( $n = 194$ ). Males and females were represented from each country; our total sample included 781 males (36%) and 1,379 females (64%). In our sample, 16% ( $n = 341$ ) were from countries whose native language is English (Canada and the United States), and 84% ( $n = 1,819$ ) were from countries whose native language is Spanish (Argentina, Colombia, Costa Rica, the Dominican Republic, Ecuador, El Salvador, Mexico, Panama, Peru, Paraguay, Spain, and Venezuela). The average student age for the total sample was 24.72. Relative socioeconomic status of students in this sample was assessed based on a single question that asked "Relative to the people in your country, would you say that your family is 1 (lower class) to 10 (upper class)?" The average self-reported socioeconomic status rating for our sample was 4.72. See Schultz and Zelezny (1999) for more detail on the sample.

A four-page questionnaire was designed to assess students' demographic characteristics, general environmental attitudes, value-based environmental attitudes, and proenvironmental behaviors. General environmental attitudes were measured using the revised 15-item NEP Scale (Dunlap et al., 2000), which

includes a 5-point Likert response scale that ranges from 1 (*strongly agree*) to 5 (*strongly disagree*). Value-based environmental attitudes were measured using 14 items from Thompson and Barton's (1994) scale. Of particular interest here were value-based ecocentric environmental attitudes, which reflect the belief that the environment should be preserved because of the intrinsic value of the biosphere and of all living things. Specifically, value-based ecocentric environmental attitudes were measured by seven items (items 2, 5, 7, 26, 30, 32, and 33 from Thompson & Barton's scale) using a 5-point Likert response scale that ranged from 1 (*strongly agree*) to 5 (*strongly disagree*). Environmental behaviors were measured by 12 questions designed by the current authors that asked about students' past participation (i.e., daily, weekly, and monthly) in proenvironmental behaviors (e.g., political activism, recycling, energy conservation, water conservation, purchasing environmentally safe products, and using public transportation). These behavioral items included a 5-point Likert-type response scale. Finally, demographic characteristics (e.g., gender, age, socioeconomic status, education, and strength of religious beliefs) were assessed using a combination of response scales (categorical choice [gender, age, education], religious beliefs).

The questionnaire was pilot tested, translated from English to Spanish, and translated back from Spanish to English to maximize measurement validity. Questionnaires were group-administered in classes. Students participated voluntarily. Neither the students nor the contacts were monetarily compensated for participation, although in some cases students were given extra credit in courses.

We used descriptive and inferential statistical techniques to test our hypotheses. We predicted that, compared to males, females across countries would report significantly stronger environmental attitudes as measured by the NEP Scale. Our prediction was partly supported.

Using descriptive analysis, we found that interesting patterns in NEP environmental attitudes emerged. Females reported higher NEP environmental attitudes than males in 10 of the 14 countries (Argentina, Canada, Costa Rica, the Dominican Republic, Mexico, Panama, Paraguay, Peru, Spain, and the United States); males had higher NEP environmental attitudes than females in 3 of the 14 countries (Colombia, Ecuador, and El Salvador); and males and females did not differ on NEP environmental attitudes in 1 of the 14 countries (Venezuela). We found that females overall in our 14-country sample reported significantly stronger NEP environmental attitudes than males,  $F(1, 1870) = 4.24, p < .001$ . When we analyzed gender differences by country, however, which substantially reduced our statistical power, we found significant gender differences in NEP environmental attitudes only in the United States.

We also predicted that females would report significantly higher levels of value-based ecocentric environmental attitudes than males. This prediction was partly supported. Compared to males, females reported stronger ecocentric environmental attitudes in 12 of the 14 countries (Argentina, Canada, Colombia, Costa

Rica, El Salvador, Mexico, Panama, Paraguay, Peru, Spain, the United States, and Venezuela); and males reported higher ecocentric environmental attitudes than females in 2 of the 14 countries (the Dominican Republic and Ecuador). Overall we found that females in our 14-country sample did report greater ecocentric environmental attitudes than males,  $F(1, 2042) = 20.43, p < .001$ . However, significant gender differences in ecocentric environmental attitudes within countries were found only in Argentina and Panama.

Finally, we predicted that females would report greater participation in proenvironmental behaviors than males, which was partly supported. Females reported greater participation in proenvironmental behaviors than males in 11 of the 14 countries (Argentina, Canada, Costa Rica, Ecuador, El Salvador, Mexico, Paraguay, Peru, Spain, the United States, and Venezuela); and males reported greater participation in proenvironmental behavior than females in 3 of the 14 countries (the Dominican Republic, Colombia, and Panama). Overall analyses revealed that females in our 14-country sample did report greater participation in proenvironmental behaviors than males,  $F(1, 1870) = 14.64, p < .001$ ; within countries, however, significant gender differences in proenvironmental behavior were found only in Paraguay and Venezuela.

The effect sizes of gender on environmental variables were calculated using the results from Study 2. The effect of gender on NEP environmental attitudes was  $r = .04$ , on value-based ecocentric environmental attitudes was  $r = .10$ , and on proenvironmental behaviors was  $r = .09$  (see Table 2).

As a group, females across 14 countries did, in fact, report significantly stronger NEP environmental attitudes, stronger value-based ecocentric environmental attitudes, and greater participation in proenvironmental behaviors, although gender differences in environmental attitudes and behaviors within countries were less convincing. When significant gender differences in environmental attitudes and behaviors were found within countries, however, females were consistently more proenvironmental than men. Moreover, the descriptive patterns among countries were also notable; among the range of average scores, females consistently reported higher ratings than males on all variables, including proenvironmental behaviors (e.g., political activism).

These findings attenuate Davidson and Freudenberg's (1996) claim that gender differences in environmentalism are not universal. Gender differences in environmentalism were found across 14 countries, not just the United States, which leads us to question the role of gender socialization in environmentalism. We are careful, however, to note the limitations of our investigation. Our sample in Study 2 was not representative in many ways. All of the individuals in this multicountry study were university students; therefore, sampling bias and generalizability were a concern. We recognize that female university students, especially those from underdeveloped countries, may have been more nontraditional in their gender attitudes and behaviors, which would result in weak gender effects, as we found in

Study 2. Further, we did not find gender differences in environmental attitudes and behaviors within countries, which we attributed partly to lack of statistical power within countries.

In our view, Studies 1 and 2 advance past studies on gender and environmentalism because we examined a broader spectrum of males and females, across ages and countries, on both environmental attitudes and behaviors, and we found very consistent patterns. Females reported stronger environmental attitudes and behaviors than men across ages and countries. Other interesting findings also emerged. We found that as a single variable, the effect of gender on environmental attitudes and behaviors, was strongest among young people; in addition, the effect of gender on proenvironmental behavior was consistently stronger than on environmental attitudes (see Table 2).

Given that these studies provide new evidence that describes gender differences in environmentalism, a more difficult question remains: How can we empirically explain these differences? Using gender socialization theory, which was discussed earlier in this article, we developed Study 3 to examine the role of socialization on gender differences and environmentalism. We predicted that, compared to males, females would have a stronger “extended other” orientation and a stronger social “ethic of care” to take responsibility for alleviating problems in the world, as theorized by Gilligan (1982) and others.

### Study 3: Explaining Gender Differences and Environmentalism

University students ( $N = 119$ ; 79 females and 40 males) volunteered to participate in this survey on environmental attitudes, gender orientation, socialized other orientation, and social responsibility. The average age of participants was 20.54.

A questionnaire was designed to measure general environmental attitudes, using the NEP Scale (Dunlap & Van Liere, 1978); feminine and masculine orientation, using the California Psychological Inventory (CPI) Femininity and Masculinity scale; the ability to take the role of a conceptualized other, using the CPI Socialization scale; and ethic of care to take responsibility for ameliorating social problems, using the Minnesota Multiphasic Personality Inventory (MMPI) Social Responsibility subscale. In addition, demographic (i.e., gender, age, perceived socioeconomic status, political affiliation) information was assessed. Questionnaires were group administered.

Using  $t$ -test analyses, we again found that females ( $M = 36.89$ ,  $SD = 4.29$ ) reported significantly more NEP concern for the environment than males ( $M = 34.33$ ,  $SD = 5.90$ ),  $t(117) = -2.702$ ,  $p = .008$ . Post hoc analyses using estimate of omega-squared showed that 5% of the variance in general NEP environmental concern was accounted for by gender. These findings were consistent with the previously cited findings in Studies 1 and 2 (see Table 2).

Hypothesis 1, which predicted gender differences in affinity to take the role of a conceptualized other, was supported. Compared to males ( $M = 30.14$ ,  $SD = 6.63$ ), females ( $M = 33.66$ ,  $SD = 5.18$ ) were more able to take the role of a conceptualized other as measured by the CPI Socialization scale,  $t(109) = -3.034$ ,  $p = .003$ . Estimate of omega-squared showed that 6.88% of the variance in one's ability to take the role of a conceptualized other was explained by gender.

Hypothesis 2, which predicted gender differences in social responsibility, was also supported. Compared to males ( $M = 94.68$ ,  $SD = 13.94$ ), females ( $M = 102.75$ ,  $SD = 10.72$ ) reported stronger levels of social responsibility, as measured by the MMPI Social Responsibility subscale,  $t(112) = 3.417$ ,  $p = .001$ . Gender accounted for 8.56% of the variance in social responsibility, using estimate of omega-squared post hoc analyses.

In addition, post hoc analyses showed that CPI Femininity was positively correlated with general NEP environmental attitudes ( $r = .249$ ,  $p = .008$ ); however, CPI Masculinity was negatively correlated with NEP concern ( $r = -.273$ ,  $p = .004$ ). Notably, the effect of feminine orientation, as shown in Study 3, was stronger than the effect of gender, as shown in Studies 1 and 2, on NEP environmental attitudes (see Table 2). Future research is recommended to examine the role of gender orientation in environmentalism.

### Summary and Conclusions

In summary, Study 3's findings implicitly support gender socialization as an explanation for gender differences in environmentalism. Study 3 corroborated the findings in Studies 1 and 2 and other gender socialization research. Like Studies 1 and 2, Study 3 found gender differences in NEP environmental concern. In addition, this study found that, compared to males, females had a stronger ability to take the role of a conceptualized other (i.e., other orientation), which was also supported by Gough (1960, 1994), and stronger levels of social responsibility, as reported by Borden and Francis (1978).

In addition, the findings in Studies 1 and 2 also indirectly support gender socialization as an explanation for gender differences in environmentalism. Females across 14 countries in Study 2 reported stronger ecocentrism (concern for nature, the biosphere, and all living things) than males, which in our view represents an "other orientation." And in Study 1, female youth, compared to male youth, reported stronger personal responsibility for improving the environment, and these findings were consistent across 2 years.

Of course, there may be other explanations for gender differences in environmental attitudes and behaviors. Our studies relied on self-reports, therefore, we wondered whether gender differences in socially desirable responding might explain these findings. However, a recent paper by Zelezny and Yelverton (2000) found that social desirability was not significantly related to gender, NEP environmental attitudes, or intentions to act proenvironmentally.

We also recognize the potential for generation effects; that is, the relationship between gender and environmentalism may have changed over the past years. However, if this were so, it would suggest that gender differences in environmentalism are likely due to socialization rather than inherent biological differences, as described by ecofeminists and others. Meta-analytic research that compares past and present studies on gender and environmental attitudes and behaviors is needed to clarify the emergence of change over time.

Finally, the findings in this article raise important new questions for future research: (1) What are the mediating links between gender, socialization, and social responsibility and environmental concern? (2) How can the impact of gender socialization on environmentalism be directly examined? (3) What is the role of parenting on gender socialization and environmentalism? and (4) Are psychologically androgynous individuals, who attain higher levels of moral development, more proenvironmental?

In conclusion, we assert that a clearer picture has emerged with regard to gender and environmentalism. Contrary to past research findings, females are not passive, indifferent, or unconcerned about the environment. Moreover, we believe that these findings have implications for theory, social action, and policy. Specifically, we project that future models of environmentalism will include gender as a relevant predictor of environmentalism and that collectively females will be influential in future environmental activism, policy development, and political leadership. Surely, environmental improvement will require the collective, conscientious effort of men, women, and children from all nations of the world. Our studies simply support the idea that females will play an active and positive role in this progress.

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