




Research Article

Good patriotism, social consideration, environmental problem cognition, and pro-environmental attitudes and behaviors: a cross-sectional study of Chinese attitudes

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Abstract

Recent studies have indicated a positive association between patriotism and environmentalism; however, the correlation between them has not yet been quantitatively verified. Additionally, differences in “good” versus “blind” patriotism have been ignored in environmental behavior studies; thus, theoretical concepts related to their effects on environmentalism have not been empirically tested. The present study aims to reveal the effects of good patriotism and social consideration on pro-environmental attitudes and behaviors, and the mediating effect of social consideration on the relationship between patriotism and pro-environmental attitudes and behaviors, while removing national or political prejudice or ideology from the measurement of patriotism. Data collected using a self-report questionnaire were analyzed for Chinese university students and workers. Results of multiple hierarchical linear regression analysis of five pro-environmental attitudes/behaviors estimation models showed that patriotism was correlated with pro-environmental attitudes and behaviors, and this correlation was completely mediated by individual social consideration, which was strongly and positively correlated with both patriotism and pro-environmental attitudes and behaviors. Our findings show that patriotism encourages people to focus on societal structures and environmental problems. The effect of good patriotism on individual pro-environmental attitudes and behaviors is clearly different from that of blind nationalism, as shown in previous literature. The present study highlights implications for future policy-making and education on patriotism and environmentalism in China.

Keywords Patriotism · Pro-environmental behavior · Social consideration · Good patriotism · Blind patriotism · Nationalism

1 Introduction

Patriotism is the “love, devotion, and a strong differential concern for one’s own locality, state, region, or country, shown both in thought and action” [13], p. 186. Individuals’ genuine attachment to a particular nation implies feelings of belongingness, responsibility, loyalty, and pride [7, 68, 76]. Patriotism is frequently regarded as analogous to nationalism, which can be considered a result of national

identity [10], where one shares membership and interests with a nation [97]. National identity is identification with a social group [55], and such collective identification is significantly related to willingness to participate in collective action [81, 83]. Further, if they are induced by perceived ethnic competition and threats, patriotism and nationalism can be closely associated with chauvinism [19].

Some studies have postulated that patriotism differs from nationalism and chauvinism [7, 10]. Nationalism

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represents an in-group, or the sense of a country's superiority [53, 72], and is correlated with authoritarianism [38] and hostility toward others [49]. In Cafaro's [13] patriotism framework, nationalism and chauvinism are "bad" patriotism, which we call "blind" nationalism in the present study, characterized by an unquestioning idealized valuation of, and blind obedience and intolerance of criticism toward, one's country [10, 76]. This supports homogeneity and the rejection of out-groups and minorities [10]. "Good" patriotism, however, accepts heterogeneous societal structures and is not always linked to out-group rejection or derogation [10, 13, 68, 82].

Owing to the dual nature of patriotism, concepts such as nationalism or conservatism are often intermingled with it; thus, good patriotism's specific effects on environmentalism have not been clarified. Individuals with good patriotism are highly loyal toward, and feel a moral obligation to preserve, their country [94]; therefore, patriotism is associated with voluntary participation in efforts that benefit others and society [55, 29]. However, excessive in-group loyalty frequently blinds people to national or local environmental problems [4, 11]. Thus, the relationship between patriotism and environmentalism has not been quantitatively assessed, and interpretations can be contradictory. To further understand good patriotism within the field of environmental psychology, the present study aims to investigate the impact of good patriotism on individual environmentalism.

1.1 Patriotism and pro-environmental attitudes and behaviors

Value-belief-norm theory posits that the psychological mechanism of individual environmental behaviors consists of a causal chain that moves from relatively stable values and general beliefs to more focused personal beliefs and norms for pro-environmental actions [85, 86, 79, 87]. To represent individual pro-environmental values, a mixed model of self-interest and altruism is frequently applied [6]. This model assumes that differences in individual beliefs regarding environmental issues are derived from corresponding value orientations based on egoistic, social- or bio-altruistic, and biospheric values [33, 86]: an awareness of environmental problems' harmful consequences on what individuals value, such as themselves, others, plants, or animals [77, 86]. Other scholars use similar terms, such as homocentric, ecocentric and egocentric values [62], and ecocentrism versus anthropocentrism [27, 71, 89]. Generally, in the mixed model, egotism has been shown to negatively correlate with pro-environmental behaviors, whereas altruism and biospheric values independently foster pro-environmental behaviors, attitudes, and/or knowledge [18, 48, 54, 94, 92].

Thus, individuals with good patriotism are assumed to possess high pro-environmental concerns and beliefs regarding their country, as national loyalty leads people to feel a moral obligation to preserve their country [94]. Environmental activists typically work to protect and preserve the places they love [4], and individuals with a strong national identity generally help further their country's development and welfare. Therefore, patriotism is significantly associated with greater voluntary efforts to benefit others or society [55, 56].

Conversely, excessive in-group loyalty frequently allows people to ignore national or local environmental problems [11]. National or political differences exist in the individual awareness of environmental issues in one's own country and affect pro-environmental attitudes and behaviors [17, 22, 52, 98]. According to moral foundations theory [26, 31], conservatives are more likely than liberals to be unable or unwilling to perceive or understand environmental problems [98], such as climate change [61, 75, 91], energy efficiency [28], and pollution [52]. Conservatives by definition tend to justify and defend the current social and economic system, therefore avoiding the challenge of conspicuous environmental problems [61]. Furthermore, nationalism sometimes includes a materialistic drive to secure limited resources and maximize national interests, thus subsuming environmental concerns [4]. This can lead to seeking excessive in-group profits and decreasing benefits for out-groups (e.g., exporting waste, scrambling for scarce resources), creating skepticism toward real problems.

Patriotism, nationalism, and conservatism are common when focusing on loyalty to and the well-being of one's in-group [26, 31, 75], and such values should be compatible with environmental protection for the sustainability of society. However, in the context of global environmental protection and sustainability, good patriotism conflicts with some other ideological concepts. Nationalism, blind patriotism, and conservatism are associated with skepticism toward environmental problems in one's country [11, 98], with negative responses toward environmental policies perceived as being due to pressure from out-groups [17] and international competition for scarce resources [4]. There are anthropological differences among these national ideologies as the two sides of patriotism—"blind" and "good." Studies still leave room to examine the dual nature of patriotism toward environmental protection and inconsistencies between conceptual taxonomy about patriotism and the characterization of each concept regarding environmental protection.

1.2 Nationalism, patriotism, and environmentalism in China

The present study's geo-cultural context is China. Chinese nationalism and patriotism are unique and differ from Western cultures' versions. Nationalism in China is deep and visceral [25], developed within a tempestuous historical context. As many researchers have argued, Chinese nationalism mainly developed from the effects of continued humiliation by outsiders, leading to intensification of the Chinese Communist Party's (CCP) anti-foreign propaganda efforts [29, 45, 64, 104]. Aggressive nationalism manifested especially after 1992–1993 strongly rooted in the unifying patriotism of the war-time struggle against Japan [25]. The CCP connects patriotism to love for the party state and has attempted to shift the meaning of patriotism to benefit the CCP [29, 30]. Historically, compulsory nationalism and patriotism in China were constructed and driven by the CCP.

Currently, with the state of globalization and international perspectives in China, the focus of patriotism has shifted from a socialist state to a national collective, with education on civic values regarding social participation, the importance of harmony between the state and the people, and the nation's communal ideal [46, 51]. Currently, for Chinese youth, patriotism is mostly separate from political discourse, and paying taxes, studying the Chinese language, and environmentalism is recognized as patriotic [99]. Chinese youth who have grown up under such conditions are less nationalistic than older generations, and China is less nationalistic today compared to the early 2000s [45]. Chinese patriotism is not simply party propaganda, but conceived and developed by Chinese citizens, and the people of China are currently shaping modern patriotism for themselves, not led by the CCP [64, 99]. Unlike in the past, people in China today are patriotic in diverse ways.

The CCP's current interests include achieving sustainable economic development [37, 65, 84, 95]. Furthermore, substantial environmental threats have shifted the viewpoint in China. Rather than prioritizing economic growth over environmental protection [37], people recognize that pollution has damaged individuals' health and material interests [93], and the public has become aware of environmental pollution and their own grievances [15, 34, 65, 93, 100].

1.3 Aims and hypotheses

The present study aimed to investigate the impact of good patriotism on individual environmentalism, with the following objectives. First, we examined the positive correlation between good patriotism and high environmentalism.

We agree with Cafaro [13] that how environmentalists work to protect places they know and love, involve themselves in their communities, and want to preserve such places for their children can be considered patriotism. Prior literature posited high affinity between good patriotism and pro-environmental attitudes [13, 55, 56, 94]; however, previous quantitative studies did not distinguish between good and blind patriotism when investigating patriotism's correlation with environmentalism. To account for the differences between good and blind patriotism, we removed national or political prejudice or ideology as much as possible and tried to measure pure patriotism.

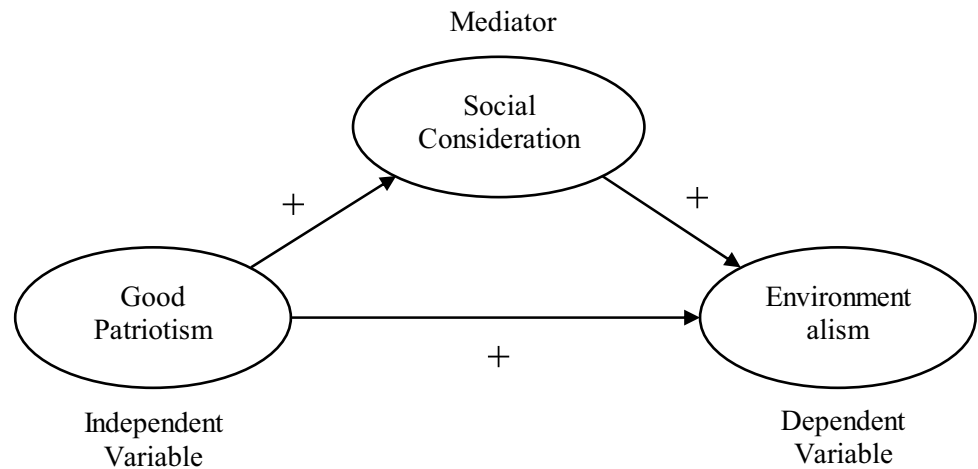
Second, based on the view that patriotism does not incorporate blind obedience, we also aimed to identify whether it promotes individual social consideration. Blind patriotism is rooted in in-group loyalty; however, the true problem is intrinsically due to egoism toward out-groups. If patriotism includes impartial altruism toward society [13] and consideration for others, if this altruism fosters environmentalism as prior studies assumed [18, 48, 54, 77, 88, 92], and if this patriotism has effects on environmentalism, such a structural relationship should be quantitatively revealed in our analysis. Thus, consideration for society and others was assumed to mediate the relationship between patriotism and environmentalism. Such results would provide evidence of the conceptual essence of good patriotism, which differs from blind patriotism.

Third, we aimed to examine patriotism and environmentalism in modern China. Most studies on the relationship between national ideology and pro-environmental behaviors have been conducted in the US and other Western countries; thus, the Chinese geo-cultural context represents a large research gap. Without chauvinism or blind patriotism, including hostility against enemy countries and exclusion of out-groups, pure patriotism in China needs to be examined in relation to national sustainable development. Additionally, to direct social movement toward environmental protections in China, it is necessary to identify psychological factors that promote spontaneous pro-environmental behaviors and attitudes. By revealing the correlation between current patriotism in China and pro-environmental behaviors, the present study can contribute to future policy-making and education on patriotism and environmentalism.

To test these aims, we focused on the correlations among patriotism, social consideration, and pro-environmental attitudes and behaviors. Especially, the following hypotheses were tested in the statistical model (and conceptual framework is presented in Fig. 1):

Hypothesis 1 Individual good patriotism is positively correlated with social consideration and pro-environmental attitudes and behaviors.

Fig. 1 Conceptual framework of this study



Hypothesis 2 Individual social consideration is positively correlated with individual environmental problem cognition and pro-environmental attitudes and behaviors.

Hypothesis 3 Social consideration mediates the effects of patriotism on environmental problem cognition and pro-environmental attitudes and behaviors.

2 Material and method

2.1 Participants

We conducted a questionnaire survey to measure patriotism, social consideration, environmental problem cognition, and pro-environmental attitudes and behaviors. The distribution and collection of the questionnaire were conducted from July 2017 to September 2018 through our acquaintances in China. We requested cooperators in China, three professors, and four firm managers, to recruit participants and distribute questionnaires from universities in Shanghai, Amoy, and Shenyang city, and employees of firms in Dalian, Shanghai, Amoy, and Shenyang city. The purpose of the study and the questionnaire was explained to participants before they agreed to take part in the study. After providing written informed consent, participants could still withdraw if they did not agree with or intend to answer the questionnaire, or if they did not submit or otherwise complete it. The questionnaire was voluntary and anonymous. The content of the questionnaire and the entire study were reviewed and approved by the research ethics board at a Chubu University. The authors have no affiliation with any organization with a direct or indirect financial interest in the subject matter discussed in the manuscript.

A total of 200 questionnaires were distributed, and 192 (79 female; 99 university students; 65 full-time workers)

were collected. The datasets during and/or analyzed during the current study are available from the corresponding author on reasonable request. Approximately 70% of the participants had a university degree or were university students, and 10% had graduated high school. The analysis included 150 valid questionnaires (mean age = 27.7 years, range = 14–63 years), excluding questionnaires with missing values. This was appropriately larger than the required sample size of 53, determined through a priori power analysis to have 0.80 power [20] in regression analyses, set by $f^2 = 0.15$, two tails, and $\alpha = 0.05$, as calculated by G*Power version 3.1.9.4 [23].

2.2 Materials

All participants answered identical eight-page questionnaires that incorporated open- and closed-ended questions. The questionnaire included items on environmental problem cognition, pro-environmental behaviors and attitudes, social consideration, patriotism, and respondents' basic attributes. For scaling items, all responses were recorded on seven-point Likert-type scales. Variables were reverse coded where appropriate (1 = strongly disagree, 7 = strongly agree). After we constructed the questionnaire, we asked Chinese research cooperators (university professors and firm managers that distribute questionnaires) to provide feedback about necessary corrections and revisions and feasibility of items.

2.2.1 Good patriotism

In most previous research measuring patriotism, scales unavoidably reported an individual's political ideology [41, 53]. We aimed to investigate pure attachment to one's home country [7, 13] and its impact on intrinsic and spontaneous pro-environmental attitudes, not behaviors driven by political pressure or penalties. Therefore, we did not

take items related to political orientation or ideology into account in measuring good patriotism. Additionally, we wanted to avoid items affected by the imbalance in the cost of living and criminal occurrence probability among nations [47]. Based on these considerations, we used five items for measuring good patriotism: "I am proud to be Chinese" [47, 53], "I love the country of China" [47, 53], "Affection toward the nation is the most important emotion as a citizen" [47], "I don't feel much attachment to China" [47, reverse-coded], "I am proud to work at a Chinese company/I am proud to study at a Chinese university" (newly generated for use in this study).

In exploring the effect of good patriotism on pro-environmental attitudes and behaviors, measuring the "blindness" of patriotism at the same time and comparing the effects of both types of patriotism with testing hypotheses, good patriotism had a positive effect and blind patriotism had a negative effect on pro-environmental attitudes and behaviors. However, we felt that asking about anti-government attitudes or opinions in China would be inappropriate because showing anti-political and/or leftist views may lead to government oppression. We were concerned that non-cooperation from participants would reduce the sample size or measurement accuracy; therefore, we did not include blind patriotism items and instead prioritized examining good patriotism in China.

2.2.2 Social consideration

We assumed that patriotism encourages individual consideration for society and others, which would positively correlate with individual spontaneous pro-environmental attitudes and behaviors. In this study, this kind of consideration is defined as the individual consciousness of giving careful thought to the whole society he/she lives in and the others living in the same society. In our definition, patriotism is attachment to one's own country and a differential concern [7, 13], while consideration for society and others is how individuals take account of the social construction, others and their relationships with them, and their roles in society [67, 102].

This study used the Social Consideration Scale developed by Yoshida et al. [102], which measures what individuals think about society overall and individual attitudes toward understanding the fabric of society, focusing on individuals' cognizance of their roles in society and the interactions between society and themselves [67, 102]. Previous studies identified that this scale is more or less determinant of individual judgment about one's behavior in society, such as avoiding social annoyance [102], identifying social issues [67], and logical and critical thinking [40]. This scale includes 13 items developed by Yoshida et al. [102]; however, in this study, the item "I sometimes

consider what others living in the same society will think of my actions" was eliminated because our objective in using this scale was to measure voluntary social consideration, without pressure from others. Therefore, 12 items shown in Table 2 were used in this study. Previous studies have demonstrated high internal consistency, $\alpha=0.91$ [102] or $\alpha=0.92$ [67], with one factor extracted by factor analysis.

2.2.3 Environmentalism

In order to investigate the good patriotism and social consideration's effects on environmentalism, we adopted measures of individual pro-environmental behavior and attitudes as environmentalism measurement. Here, environmentalism is regarded broadly as an individual philosophy that leads to pro-environmental values, concern, attitudes, and behavior; see [17, 92, 98]. Among them, pro-environmental behavior and attitudes can be regarded as the components of environmentalism and the outputs of pro-environmental values [86]. They are the variables that are likely to be visible and are comparatively easy for participants to recognize.

The New Ecological Paradigm scale [15, 18, 21, 44, 50, 77, 103] has been broadly applied to measure individual beliefs, values, and norms about pro-environmental actions and responsibilities, and rates the determinants of pro-environmental attitudes and/or behaviors. To measure the direct influence of individual pro-environmental behaviors and attitudes on environmental protection as an objective variable, several previous studies used variables related to situation-specific behaviors and attitudes [5, 24, 39, 59, 60, 85, 77, 78, 96, 101].

To identify direct correlations among patriotism, social consideration, environmental problem cognition, and pro-environmental attitudes and behaviors, we applied direct measurements of individual pro-environmental behaviors and attitudes as the explanatory variables in analysis. We constructed fifteen items for the direct measurement of pro-environmental attitudes and behaviors, which are a mix of items that we picked up from prior literature and items that we developed based on our interest in Chinese characteristics.

Measuring pro-environmental behavior, we adopted six items based on the idea of prior studies as follows: "I turn off lights I am not using (referring to [96, 101])," "I use the air conditioner on low power (referring to [16])," "I use public transportation instead of a car when possible (referring to [2])," "I try to buy energy-saving household electrical appliances (referring to [1])," "I try to buy recycled goods (referring to [63])," and "I frequently use eco-friendly shopping bags (referring to [69])."

Additionally, we included individual Chinese concerns for the environmental issues China is facing, which

are assumed to have a direct correlation impact on pro-environmental behavior, based on the theory of planned behavior [3, 5, 35]. Previous literature argued that Chinese people's priorities have shifted to recognize that pollution has damaged individuals' health and material interests [93] and they have become aware of environmental pollution and their own grievances [15, 34, 65, 93, 100]. To incorporate these changes in attitudes toward environmental problems, "I think the environmental problems China is facing are profoundly serious," "I think the energy sustainability issues China is facing are profoundly serious" (cognition of environmental problems), "I am constantly thinking about the environment," "I am interested in the environmental problems that China is facing," "I think citizens should study China's energy/environmental problems," "I think citizens should sort their garbage," "I think the city I live in should be more hygienic," "I prioritize maintaining my/our standard of living over engaging in energy-saving and garbage-reducing actions," and "The top priority for China is not environmental problem-solving, but furthering national economic growth" were added to the list of environmentalism-measuring items.

2.2.4 Control variables

We considered several participants' background variables in the analysis and settled on "gender," "age," and "education level" as control variables in this study. We asked about each of the three variables in the questionnaire; gender and education level are selective, and age is descriptive. Then, in the data coordinating process, we applied a dummy code to the gender variable (male = 1 and female = 0). We used participants' ages for the age variable. For level, we used years of schooling based on participant's answers regarding educational background, such as Doctor of University = 20 years, Master of University = 18 years, Bachelor of University = 16 years, vocational and technical schools = 14 years, senior high school = 12 years, and junior high school = 9 years. In the statistical analysis, we used the following control variables of individual's attributes: gender dummy codes as "gender," age as "age" (without coding), and schooling years as "education level."

2.3 Analytical methods

Before performing regression analysis, exploratory factor analyses (EFA) were separately conducted for patriotism, social consideration, and pro-environmental factors using maximum likelihood estimation (MLE) with promax rotation. Next, we examined the determinant power of patriotism and the mediation effect of social consideration on environmentalism using the hierarchical linear modeling (HLM) in regression analyses. In this study, we applied the

mediation analysis developed by Baron and Kenny [8], which is formulated based on the regression model (e.g., Baron and Kenny [8]; Zhao et al. [105]). In Step 1, controlling for gender, age, and education level (entered at Step 1), we examined patriotism's direct effect on individual environmentalism. In Step 2, we entered social consideration into the original multiple regression analysis to test its correlations and/or mediating effect between patriotism and pro-environmental factors. All statistical analyses were conducted using SPSS software, version 23.

3 Results

3.1 Descriptive statics and factor analysis

Table 1 shows descriptive statics and the EFA results. The mean of the five patriotism items ($M = 6.16$) was higher than that of the 12 social consideration items ($M = 5.44$). Regarding individual pro-environmental factors, the highest mean score was for the item "I think the city I live in should be more hygienic." The lowest mean score was for "The top priority for China is not environmental problem-solving but furthering national economic growth".

In the MLE factor analysis for the five patriotism items in the first time, one factor was extracted, which coincided with previous literature [47, 53]. The first eigenvalue was 2.960 and the other following eigenvalues were < 1.0 , and one component explained 59.2% of variance ($\times 2 = 12.706$, $df = 5$, $p = 0.026$, Cronbach's $\alpha = 0.51$). However, we excluded "I don't feel much attachment to China" (reverse coded) due to its low factor loading ($FL = 0.252$), re-ran the analysis, and obtained the same result of the extracted one factor with the first eigenvalue = 2.848 and 71.2% variance explanation of the one component ($\times 2 = 2.218$, $df = 2$, $p = 0.330$, Cronbach's $\alpha = 0.86$). From our results, the remaining items are assumed to validly express good patriotism.

In the MLE factor analysis conducted on the 12 social consideration items, one factor was extracted with the first eigenvalue, which was 7.836, and the other following eigenvalues were < 1.0 , and one component explained 65.3% of variance ($\times 2 = 390.927$, $df = 54$, $p < 0.000$). This result also coincided with prior studies [67, 102] and showed high internal item consistency ($\alpha = 0.95$).

Another MLE factor analysis was conducted on the 15 pro-environmental items, and the first five eigenvalues were 5.285, 1.572, 1.468, 1.076, and 1.003, with the proportion of variance accounted for by each component of 35.23%, 10.48%, 9.79%, 7.18%, and 6.69% of the total variance ($\times 2 = 39.074$, $df = 40$, $p = 0.512$). Each described clearly different concepts: (1) expectations for environmental improvement ($\alpha = 0.768$, 4 items), (2) green

Table 1 Descriptive statistics

	M	SD	Variance	Factor I	Factor II	Factor III	Factor IV	Factor V
<i>Participants' attribute distribution</i>								
Gender (male dummy: male = 1, female = 0) Proportion: male = 88 (58.7%), female = 62 (41.3%)	0.403	0.492	0.242					
Age (range: 14–63) Proportion: 10 s = 23 (15.3%), 20 s = 82 (54.7%), 30 s = 29 (19.3%), 40 s = 10 (6.7%), 50 s = 4 (2.7%), 60 s = 2 (1.3%)	27.713	10.626	112.917					
Educational level (weighted by schooling years, range: 9–20) Proportion: Doctor of University (20 years) = 2, Master of University (18 years) = 7, Bachelor or Bachelor's degree of University (16 years) = 115, vocational and technical schools (14 years) = 13, senior high school (12 years) = 13, junior high school (9 years) = 0	15.308	1.817	3.301					
<i>Factors extracted by 1st EFA (dependent variables)</i>								
<i>Expectations for environmental improvement</i>								
I think citizens should study the energy/environmental problems of China	6.306	1.233	1.521	0.976	0.446	0.432	0.360	–0.143
I think citizens should sort their garbage	6.071	1.222	1.492	0.805	0.588	0.565	0.283	–0.255
I think the city I live in should be more hygienic	6.500	1.111	1.235	0.584	0.313	0.479	0.418	–0.130
I try to buy energy-saving household electrical appliances	5.372	1.434	2.056	0.516	0.944	0.560	0.331	–0.082
<i>Green buying</i>								
I try to buy recycled goods	5.313	1.424	2.028	0.465	0.842	0.558	0.231	–0.058
I turn off lights I am not using	6.022	1.366	1.867	0.634	0.477	0.679	0.315	–0.186
<i>Daily pro-environmental behavior</i>								
I frequently use eco-friendly shopping bags	5.212	1.706	2.911	0.272	0.359	0.661	0.170	–0.021
I use public transportation instead of a car when possible	5.672	1.498	2.244	0.438	0.573	0.603	0.216	–0.250
I am interested in the environmental problems that China is facing	5.694	1.388	1.928	0.518	0.473	0.596	0.354	–0.204
I use the air conditioner on low power	5.427	1.696	2.876	0.271	0.334	0.538	0.130	0.071
I am constantly thinking about the environment	5.071	1.321	1.746	0.425	0.463	0.487	0.369	–0.098
<i>Environmental problem awareness</i>								
I think the environmental problems China is facing are profoundly serious	5.710	1.392	1.937	0.368	0.175	0.247	0.967	0.051
I think the energy sustainability issues China is facing are profoundly serious	5.303	1.353	1.832	0.266	0.294	0.278	0.678	0.007
<i>Prioritizing own life/national development</i>								
The top priority for China is not environmental problem-solving but furthering national economic growth	3.431	1.786	3.191	–0.170	–0.003	–0.105	0.023	0.715
I prioritize maintaining my/our standard of living over engaging in energy-saving and garbage-reducing	3.838	1.696	2.878	0.115	0.074	0.199	0.145	0.532
<i>Factors extracted by 2nd EFA (independent variables)</i>								
<i>Social consideration</i>								
I consider my social roles	5.318	1.447	2.092	.870	–.064			
I consider the relevancy between society and my daily life	5.271	1.416	2.006	.864	–.036			
I consider how social changes influence my lifestyle	5.559	1.348	1.816	.848	.036			
I consider others in society	5.383	1.338	1.789	.835	–.055			
I am interested in social problems	5.400	1.459	2.130	.816	–.114			
I consider society's future	5.659	1.303	1.698	.810	.043			
I consider the future orientation of society	5.322	1.447	2.095	.809	–.025			
I consider the role of my actions in society	5.528	1.400	1.960	.804	.016			
I consider how my actions influence others	5.579	1.364	1.861	.753	.154			
I consider the whole society in which I live	5.854	1.294	1.673	.712	.112			
I consider social structures	4.978	1.540	2.370	.674	.027			

Table 1 (continued)

	M	SD	Variance	Factor I	Factor II	Factor III	Factor IV	Factor V
I consider how my actions influence society <i>Patriotism</i>	5.472	1.300	1.691	.667	.043			
I am proud to be Chinese	6.505	1.072	1.150	-.077	.964			
I am proud to work at a Chinese company/I am proud to study at a Chinese university	6.222	1.229	1.510	.013	.842			
Affection toward the nation is the most important emotion as a citizen	6.467	1.060	1.125	.014	.818			
I love the country of China	6.489	1.041	1.084	.072	.528			

Bold highlight means the highest factor loading for each variables

buying ($\alpha=0.865$, 2 items), (3) pro-environmental behavior ($\alpha=0.760$, 5 items), (4) environmental problem awareness ($\alpha=0.843$, 2 items), and (5) prioritizing own standard of living/national development ($\alpha=0.524$, 2 items). Cronbach's alphas for the scaled items ranged from 0.52 to 0.88. All factor loadings exceeded 0.40 [32].

3.2 Correlations among variables

Table 2 shows inter-correlations for the variables used in the regression analysis. All correlation coefficients between independent variables were adequately low ($r < 0.2$), excluding the correlation between age and education level ($r = -0.387$, $p < 0.001$). Additionally, as we assumed, patriotism and social consideration were moderately correlated ($r = 0.451$, $p < 0.001$). As the variance inflation factor values (< 2.0) in all regression models indicated, each predictor variable fell within the acceptable boundaries of tolerance, and substantive multi-collinearity was avoided.

3.3 Regression analysis

An HLM was conducted to test the hypotheses, and Table 3 shows the outcomes of the ten models for all five dependent variables extracted by the preceding EFA for pro-environmental items, including standardized partial regression coefficients and standard errors, 95% bias-corrected confidence intervals, and effect sizes for each independent variable in each model, adjusted R^2 , F value, and F value's significance for each set of Steps 1 and 2, and F statistics variation, F statistics variation's significance, and Durbin-Watson ratio for the description of variance between Steps 1 and 2. An examination of the collinearity statistics revealed that the VIF coefficient fell within the acceptable boundaries of tolerance (< 2.0), thus avoiding any substantive multi-collinearity.

In Step 1, regression analysis showed a significant effect of patriotism on all dependent variables: positively

on expectations for environmental improvement, green buying, pro-environmental behavior, and environmental problem awareness, and negatively on prioritizing standard of living/national development. These results supported Hypothesis 1. Additionally, the size of the impact of patriotism on environmentalism is in the following order: daily pro-environmental behavior, expectations for environmental improvement, green buying, and environmental problem awareness and prioritizing own life/national development.

In Step 2, regression analysis showed that social consideration had a significantly strong positive effect on expectations for environmental improvement, green buying, pro-environmental behavior, and environmental problem awareness. The sizes of the partial regression coefficients for social consideration were larger than those of patriotism and the other variables' sizes, indicating that this variable's determinant power was stronger than that of patriotism (excluding the fifth model). Only for prioritizing own life/national development did social consideration not have a statistically significant effect. Excluding the fifth dependent variable, social consideration was positively correlated with the other four pro-environmental factors, and Hypothesis 2 was mostly supported. The size of the impact of social consideration on environmentalism is in the following order: expectations for environmental improvement, daily pro-environmental behavior, green buying, and environmental problem awareness.

Furthermore, in Step 2, the statistical effect of patriotism vanished in all models under at least 95% by including social consideration. This showed that social consideration completely mediated the effect of patriotism on pro-environmental factors and mostly supported Hypothesis 3 (excluding the fifth dependent variable). Social consideration was found to be highly correlated with patriotism and pro-environmental factors, and mediated their relationship.

Regarding participants' attribute variables, each of them has statistically significant effects in some dependent variables, while the impact of these variables is limited.

Table 2 Correlation matrix with standardized 95% confidence intervals

	1	2	3	4	5	6	7	8	9	10
1 Gender (male dummy)	1	-0.025 (0.731)	-0.083(0.249)	0.011 (0.892)	0.035 (0.655)	-0.035 (0.663)	-0.167(0.036)*	-0.167(0.036)*	-0.075(0.351)	0.059(0.462)
2 Age	1	1	-0.387(0.000)**	-0.072 (0.354)	-0.045 (0.561)	-0.080 (0.322)	0.027(0.736)	0.088(0.274)	-0.196(0.014)*	-0.048(0.548)
3 Educational level	1	1	1	0.005(0.523)	.198(0.01)**	0.020(0.798)	-0.160(0.044)*	-0.120(0.133)	0.058(0.469)	-0.187(0.018)*
4 Patriotism	1	1	1	1	.451(0.000)**	.302 (0.000)**	.216(0.008)**	.330(0.000)**	.208(0.011)*	-0.196(0.017)*
5 Social consideration	1	1	1	1	1	.585(0.000)**	.419(0.000)**	.547(0.000)**	.373(0.000)**	-0.152(0.063)
6 Expectations for environmental improvement	1	1	1	1	1	1	.56(0.000)3**	.632(0.000)**	.433(0.000)**	-0.249(0.002)**
7 Green buying	1	1	1	1	1	1	1	.709(0.000)**	.310(0.000)**	-0.147(0.064)
8 Daily pro-environmental behavior	1	1	1	1	1	1	1	1	.399(0.000)**	-0.197(0.013)*
9 Environmental problem awareness	1	1	1	1	1	1	1	1	1	0.019(0.817)
10 Prioritizing standard of living /national development	1	1	1	1	1	1	1	1	1	1

*p < .05, ** p < .01

Gender (male) had a significant effect only on green buying and daily pro-environmental behavior. Age had a significant positive effect only on environmental problem awareness. Education level had a significant negative affect only on prioritizing own life/national development. However, the size of the β of all of them was not greater than the impact of social consideration. The β of gender is bigger in green buying than daily pro-environmental behavior, and the β of education level is bigger in prioritizing own life/national development models than daily pro-environmental behavior.

Excluding the fifth set of models (for prioritizing own life/national development models), the R^2 scores of each model were much higher in Step 2 relative to those in Step 1, and each ΔR^2 was statistically significant. The R^2 values for all models were 0.337 or below, and these values are generally considered to represent a weak effect size [66]. Therefore, our regression models could only explain a small percentage of the variance in the dependent variables. However, our models were coordinated for examining theory-based hypotheses and not maximizing predictive value [73]. The correlations of patriotism and social consideration with pro-environmental factors were weak; however, the statistical effects of these independent variables were frequently observed in our models as determinant factors of pro-environmental factors.

4 Discussion

4.1 Patriotism, nationalism, environmental problem cognition, and pro-environmental attitudes and behaviors

We observed that “good” patriotism strengthened participants’ pro-environmental factors; notably, this correlation was completely mediated by social consideration. The correlations tested in this study were simple yet highly robust because similar results appeared in almost all models with different dependent variables for pro-environmental factors. Contradicting the argument made in previous literature that negative aspects of patriotism or nationalism lead people to ignore national or local environmental problems [4, 10, 11, 13, 17, 52, 53, 76, 82, 98], we found that the positive aspect of patriotism clearly oriented people toward hope and taking action for national sustainability.

Our results showed a positive correlation between patriotism and social consideration. This indicated that good patriotism leads people to pay attention to what is happening locally, nationally, and globally [4, 94]. This study adapted a scale to measure patriotism by eliminating items related to political ideology or “blind” patriotism. Patriotism that involves exclusivism, criticism, ignoring

Table 3 Results of HLM for five pro-environmental factors as dependent variables

	β (SE)	Step 1			Step 2			VIF in Step 2			
		p	95% confidence interval		p	95% confidence interval		LB	95% confidence interval		
			LB	UB		LB	UB				
Expectations for environmental improvement											
$\Delta R^2 = 0.266$	0.02(0.17)	0.770	-0.286	0.385	0.02(0.14)	0.796	-0.247	0.321	1.029		
$\Delta pF = 54.782$	0.02(0.01)	0.781	-0.017	0.023	-0.01(0.01)	0.857	-0.018	0.015	1.073		
p in $\Delta F = 0.000$	0.06(0.06)	0.490	-0.082	0.171	-0.07(0.06)	0.360	-0.161	0.059	1.119		
Durbin-Watson ratio = 1.753	0.31(0.08)	0.000	0.148	0.472	0.06(0.08)	0.437	-0.092	0.212	1.244		
					0.58(0.08)	0.000	0.415	0.717	1.283		
	0.071				0.337						
	3.647(0.007)				15.045(0.000)						
Green buying											
$\Delta R^2 = 0.143$	-0.19(0.17)	0.023	-0.703	-0.052	-0.20(0.15)	0.012	-0.687	-0.086	1.029		
$\Delta pF = 24.870$	0.03(0.01)	0.728	-0.016	0.023	0.00(0.01)	0.972	-0.017	0.018	1.073		
p in $\Delta F = 0.469$	-0.05(0.06)	0.596	-0.156	0.09	-0.14(0.06)	0.088	-0.217	0.015	1.119		
Durbin-Watson ratio = 1.650	0.22(0.08)	0.009	0.053	0.368	0.03(0.08)	0.689	-0.129	0.194	1.244		
	0.066				0.43(0.08)	0.000	0.244	0.564	1.283		
	3.455(0.010)				0.208						
	-0.15(0.15)	0.068	-0.586	0.022	-0.15(0.13)	0.03	-0.557	-0.028	1.029		
Daily pro-environmental behavior											
$\Delta R^2 = 0.212$	0.09(0.01)	0.287	-0.008	0.028	0.06(0.01)	0.443	-0.01	0.022	1.073		
$\Delta pF = 44.016$	-0.01(0.06)	0.858	-0.125	0.104	-0.13(0.05)	0.084	-0.193	0.012	1.119		
p in $\Delta F = 0.000$	0.34(0.07)	0.000	0.167	0.461	0.11(0.07)	0.145	-0.037	0.248	1.244		
Durbin-Watson ratio = 1.617	0.124				0.52(0.07)	0.000	0.332	0.614	1.283		
	5.871(0.000)				0.337						
	-0.09(0.17)	0.273	-0.509	0.145	15.008(0.000)						
Environmental problem awareness											
$\Delta R^2 = 0.098$	-0.18(0.01)	0.035	-0.04	-0.001	-0.10(0.16)	0.229	-0.5	0.121	1.029		
$\Delta pF = 16.275$	0.12(0.06)	0.158	-0.035	0.212	-0.20(0.01)	0.013	-0.042	-0.005	1.073		
p in $\Delta F = 0.000$	0.21(0.08)	0.013	0.042	0.359	0.04(0.06)	0.603	-0.089	0.152	1.119		
Durbin-Watson ratio = 1.643	0.075				0.05(0.08)	0.54	-0.115	0.218	1.244		
	3.786(0.006)				0.35(0.08)	0.000	0.172	0.503	1.283		
	0.169				6.629(0.000)						

Table 3 (continued)

	β (SE)		Step 1		Step 2		VIF in Step 2		
	β (SE)	p	95% confidence interval		p	95% confidence interval		LB	UB
			LB	UB		LB	UB		
Prioritizing own life/national development	0.04(0.13)	0.595	-0.192	0.334	0.05(0.13)	0.59	-0.191	0.335	1.029
ΔR ² = 0.004	-0.15(0.01)	0.076	-0.029	0.001	-0.15(0.01)	0.086	-0.029	0.002	1.073
ΔpF = 0.527	-0.20(0.05)	0.022	-0.216	-0.017	-0.18(0.05)	0.039	-0.21	-0.006	1.119
p in ΔF = 0.469	-0.21(0.06)	0.014	-0.287	-0.033	-0.18(0.07)	0.056	-0.279	0.004	1.244
Durbin-Watson ratio = 1.723									1.283
Social consideration									
Adj R ²	0.061				0.058				
F value (p)	3.236(0.014)				2.685(0.024)				

Cell values are standardized regression coefficients and standard errors: β(SE)

* p < .05, ** p < .01

out-groups, and depriving out-groups of benefits cannot be accompanied by social consideration, which includes taking care of others and global environmental protection. Patriotism may help people not to pursue egoistical wealth at someone else's expense but rather to aim for coexistence with nature and all nations.

However, patriotism and environmentalism appear fundamentally different with regard to the objectives of individual social consideration. Patriotism is generally an attachment toward the country where one lives or was born, while environmentalism could cover a much wider range of objectives in caring for oneself, others, one's living space, a specific country, the world, the next generation, other species, or whole ecosystems [6]. In that case, however, why would those with good patriotism tend to display concern not only for their own nation's environment but also for foreign countries' environments? Our findings showed that patriotism is highly correlated with social consideration, and social consideration subsequently promotes individual pro-environmental behaviors and attitudes, including environmental sustainability and protections in other nations. This means that good patriotism allows people to consider society as a whole. Understanding the society in which they live makes people realize the importance of coexisting with all nations for mutual prosperity and sustainable development. Good patriotism by no means lets people ignore social problems or deprive out-groups of benefits. Thus, patriotism and social consideration enhance each other and have a desirable synergistic effect on environmentalism.

4.2 General policy implications

If we teach patriotism narrowly as being jingoistic, uncritical self-praise of one's nation, then we are indoctrinating rather than educating [74]. Our study's results showed that good patriotism increases people's social consideration and cognition about their roles in social sustainability. For environmental protection and sustainable development globally, teaching patriotism should be encouraged, if that patriotism reflects the respectful understanding of society as a whole and the importance of sharing benefits across borders.

Establishing patriotism in people's minds can be difficult and time-consuming, as people's attachment to their homeland is intrinsic, spontaneous, uncontrollable, and unmanageable. However, as implied by our results, promoting individual social consideration is more practical and seems to have a quicker effect than patriotism. This study revealed that the effect of social consideration on pro-environmental factors is direct, while the effect of patriotism is indirect in most cases. If people understand the structure of society correctly (especially how humans

coexist with nature), thoughtfully explore ways to adapt, and are actively involved through education, they are likely to consider their roles in realizing a sustainable society based on scientific and objective information with an impartial cross-border viewpoint. This could contribute to strengthening individual pro-environmental attitudes and lead to positive patriotism.

Impartially developing and disseminating a sense of social consideration is required regardless of country, income level, political ideas, or education level. Our results showed that individuals with high social consideration not only endeavor to commit themselves to environmentalism but also ask others to share their values regarding environmental protection. Participants with high social consideration wanted others to be knowledgeable about environmental problems in China, engage in garbage sorting, and make cities more hygienic. This suggests that if there is a large gap in levels of environmentalism among citizens, people with higher levels may feel dissatisfied with the behaviors or attitudes of those with lower levels, with the government's response toward environmental protection, with the country's low environmental education standards, and with the lack of sanitation in cities, thus feeling that all their own environmental efforts are fruitless.

4.3 Implications of the sociodemographic results

Our results showed the effect of education level on environmentalism to be limited in contrast to most previous studies [15, 36, 42, 43, 80, 90]. A statistically significant effect of education level was found only for prioritizing standard of living/national development. This indicates that in China, individual pro-environmental attitudes/behaviors depend on social consideration, not education level. These results revealed that environmental education is effective only if individuals possess a sense of social consideration. Generally, highly educated people are exposed to more information about environmental issues through schooling; therefore, education plays a key role in enhancing individual environmentalism [15, 36, 42, 80, 90]. Environmental education in China is still not profound enough to firmly develop pro-environmental morals and awareness of environmental problems. Thus, the Chinese government should carefully review existing curricula at various levels of the country's education system [14, 57] to disseminate sound information on environmental problems and protections.

Gender effects were found only for green buying and pro-environmental behaviors. This result was in line with previous studies, as women tend to be involved in pro-environmental behaviors more than men [42, 43, 87, 96]. In China, gender roles are culturally traditional, and women perform more domestic tasks, such as sorting garbage and

recycling; therefore, they have more opportunities for eco-friendly behaviors [58]. However, no gender differences were found for the other three dependent pro-environmental factor variables. Gender equality in education is the current standard in China; thus, as our study showed that there were no differences in values and environmental problem awareness.

Age had a negative effect on environmental problem awareness. This finding was in accordance with previous research [12, 15, 43, 91, 96] and partly supports existing evidence that younger people are concerned about their futures and currently face a period of intense environmental degradation, thus leading to more environmental awareness [12, 15]. However, the present results showed that such understanding or values may not increase young people's practical pro-environmental activities.

4.4 Geo-cultural implications

Our results confirmed that Chinese people have already shifted toward sustainability in national growth, away from immediate economic growth and benefits based on a short-term view. Rapid urbanization threatens the environment through pollution and resource shortages, which can influence pro-environmental consciousness. From the standpoint of environmental protection, slogans such as "do for our country" or "do for China" in traditional Chinese patriotism education do not always move people's pro-environmental attitudes and morals in favor of sustainability. Our study showed that patriotism is strongly tied with social consideration, and social consideration strongly affects environmentalism. Accurate knowledge of social structures can improve people's awareness of their roles in society, thus leading to pro-environmental attitudes and behaviors. In environmental education research, active and experimental engagement in real-world environmental problems has been the main focus [29]. Field trips provide students with opportunities to connect knowledge learned in the classroom to real-world problems, thus enhancing their understanding and influencing their learning attitudes, interests, and motivation for environmental education [9, 70]. Teaching only patriotism or environmental protection does not always lead to spontaneous participation in pro-environmental behaviors. Instead, teaching the mechanisms of social structures, or "why you have to protect the environment" and "how you protect the environment globally and in your community" effectively promotes social consideration and consequently promotes spontaneous pro-environmental activities, as we have shown.

Appropriate knowledge and understanding about national environmental conditions can also promote awareness of environmental problems and the necessity

for environmental protection. People may distrust the government if not enough information is provided to examine the validity of its policies. Trust in the government influences individual decisions regarding whether to support environmental policy issues [22, 52]. Environmental policy should be highly reliable and trustworthy, encouraging Chinese people to be more engaged in pro-environmental actions. Furthermore, sound environment-related information should be disseminated and appropriate education should be provided so that people can foster a better understanding of society and the environment.

4.5 Limitations and future research

As previous literature has pointed out, patriotism is associated with altruism [13], and altruism fosters environmentalism (e.g., [18, 92]). We did not test the correlation between altruism, patriotism, and environmentalism, and correlation or causality of patriotism with altruism, egoism, and biospheric values have not been investigated as far as we know. Future research needs to incorporate patriotism in the investigating model of internal processes of environmentalism engagement to explore more detailed relationships of patriotism with other psychological components.

Further work should also study the differences in the effects of patriotism, nationalism, and internationalism on individual pro-environmental behaviors and attitudes [47, 53]. Measuring the “blindness” of patriotism and investigating its negative effects may emphasize to a greater extent the positive side of patriotism. However, as noted above, asking about political opinions in China would be inappropriate, so we relinquished our plan to compare the effects of good versus blind patriotism. Since concepts of patriotism, nationalism, and internationalism have substantially different psychological components [47], revealing the differences of their effects on environmentalism would be worthwhile.

Our results should also be replicated in other countries to allow for comparison analyses to help us further understand how patriotism education promotes individual pro-environmental behaviors. There are fundamental differences in how each country interprets “patriotism” and provides patriotism education [51]. International comparison analyses and investigations into people’s psychological constructions about patriotism and environmentalism will lead to new critical methods that promote pro-environmental behaviors.

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Data availability The datasets during and/or analyzed during the current study are available from the corresponding author on reasonable request.

Compliance with ethical standards

Conflicts of interest All authors have participated in (a) conception and design, or analysis and interpretation of the data; (b) drafting the article or revising it critically for important intellectual content; and (c) approval of the final version. This manuscript has not been submitted to, nor is under review at, another journal or other publishing venue. The authors have no affiliation with any organization with a direct or indirect financial interest in the subject matter discussed in the manuscript. The authors have affiliations with organizations with direct or indirect financial interest in the subject matter discussed in the manuscript.

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