

How Perceived Exposure to Environmental Harm Influences Environmental Behavior in Urban China

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Received: 23 June 2011 / Revised: 8 December 2011 / Accepted: 20 June 2012

Abstract Rapid environmental degradation in China makes understanding how perceived exposure to environmental harm influences environmental attitudes and participation in pro-environmental behaviors among the Chinese people crucial. We used a nation-wide survey dataset in urban China to test two hypotheses: experiencing environmental harm directly affects environmental behavior; environmental attitudes mediate the relationship between experiencing environmental harm and environmental behavior. We found respondents who experienced environmental harm had more pro-environmental attitudes. Experiencing environmental harm positively influenced pro-environmental behavior both directly and indirectly through the mediation of pro-environmental attitudes. Among the pro-environmental behaviors, environmental litigation was most strongly related with exposure to environmental harm. Our results suggest that more participation in pro-environmental behaviors may be expected as rapid economic development increases public exposure to environmental harm in urban China.

Keywords China · Environmental attitudes · Environmental harm · New environmental paradigm · Pro-environmental behavior

INTRODUCTION

Environmental degradation and the impact it has on society came to the forefront of the world's collective consciousness in the 1970s (Dunlap et al. 2000). With the development of environmental awareness, there came an exigency to understand how humans respond to environmental degradation and pollution (Maloney et al. 1975). Because environmental quality was often recognized as a luxury

good, early studies suggested a positive relationship between people's income and pro-environmental attitudes and behavior as people have more freedom to emphasize environmental quality when their material needs are well satisfied (Van Liere and Dunlap 1980; Scott and Willits 1994). In contrast, recent studies found similar or even more pro-environmental attitudes among citizens of poor countries, hypothesizing that people in poor countries may be willing to make similar or larger economic sacrifices for environmental protection because they are more exposed to environmental harm (Dunlap and Mertig 1995; Brechin 1999; Dunlap and York 2008).

Two influential theories predicting human behavior, the theories of reasoned action and planned behavior (Fishbein and Ajzen 1975; Ajzen 1991), suggest that people weigh perceived positive and negative consequences to generate an attitude that may be translated into behavior. With respect to environmentalism, environmentally oriented attitudes are consistently related to pro-environmental behavior (Buttel 1987; Kaiser et al. 1999; Dunlap et al. 2000). Among factors that predict environmental attitudes, perceived exposure to environmental harm tends to have more impact on individuals' environmental attitudes than other sources of information such as the mass media (Gooch 1996). Environmental attitudes also may mediate the relationship between exposure to environmental harm and environmental behavior (Whitmarsh 2008). However, empirical research testing the relationships among exposure to environmental harm, environmental attitudes and behavior is limited.

Environmental attitudes and behavior are also affected by sociodemographic factors. Most research has found more pro-environmental attitudes and behavior among females and more educated people than their counterparts (Stern et al. 1993; Scott and Willits 1994; Dietz et al. 1998;

Vaske et al. 2001; Hunter et al. 2004). Occupational status, which represents social class, may also influence pro-environmental attitudes and behavior (Van Liere and Dunlap 1980; Ebreo and Vining 2001). In addition, studies found that urban residents often exhibit more pro-environmental attitudes and behavior than rural residents because urban residents are often exposed to greater environmental degradation (Mohai and Twight 1987; Arcury and Christianson 1990). Mixed results were found about the relationship between age and pro-environmental attitudes and behavior (Scott and Willits 1994; Stern et al. 1995; Tindall et al. 2003).

Global environmental degradation has created a need to understand the links between exposure to environmental harm, environmental attitudes and behavior in a systematic and international fashion (Jorgenson 2003). China can be seen as the keystone to many global conservation efforts (Liu 2010). China is the most populous nation in the world, has one of the fastest growing economies among major nations, has the largest manufacturing base in the world, is second only to the United States in energy consumption and is rapidly urbanizing (Liu and Diamond 2008). Meanwhile, China's environmental problems are among the most severe of major nations (Liu and Raven 2010). For instance, China remains the largest contributor of SO_x and is the largest emitter of CO_2 (Li 2003; Liu and Diamond 2005; Netherlands Environmental Assessment Agency 2008). Acid rain fell on more than a quarter of Chinese cities in the 1990s (World Bank 2001; Feng et al. 2002). Water quality in most Chinese rivers, groundwater sources, and lakes is poor and declining due to industrial, agricultural, and domestic wastewater discharges (Liu and Diamond 2005). Some natural disasters in China, such as dust storms, landslides, droughts and floods, are believed to be becoming more frequent due to human activities (Liu and Diamond 2005).

In one review of environmental attitudes and behavior in China, it was found that the Chinese people tended to place the responsibility for environmental protection on the government because they perceived low levels of control over the environment (Harris 2006). They tended to have anthropocentric viewpoints, and placed overwhelming emphasis on economic growth, oftentimes at the expense of the environment. Other studies on environmental values have found growing environmental consciousness among the Chinese public. For instance, pro-environmental attitudes (such as those measured with the New Environmental Paradigm scores (Dunlap et al. 2000)) among urban residents in China (Hong 2006; Chen et al. 2011) are increasing to levels similar to those among U.S. citizens (Scott and Willits 1994; Peterson et al. 2008). These studies found more pro-environmental attitudes among younger, more educated, employed, and affluent people

than their counterparts (Hong 2005; Harris 2006; Hong and Xiao 2007), which were consistent with findings in the U.S. (Buttel 1987; Dunlap et al. 2000).

The growing environmental consciousness in China has been accompanied by increasing involvement of the Chinese people in environmental protection. For instance, there were about 51 000 protests related to environmental pollution in 2005 alone in China (approximately 1000 protests per week), and this number was projected to increase rapidly (Economy 2007). Studies on pro-environmental behavior in China found correlations between environmental attitudes and behavior, suggesting the emerging environmental consciousness among the Chinese public may be translated into pro-environmental behavior (Hong 2006; Gong and Lei 2007). These studies also found more engagement in pro-environmental behavior among females, more educated and younger people (Hong 2006; Gong and Lei 2007). In addition, Chinese people who were employed, holding leadership positions and living in large cities were more likely to engage in pro-environmental behavior (Chen et al. 2011). Despite a growing body of literature on environmental attitudes and behavior in China, little is known about how people perceive and respond to personal exposure to environmental harm (Schultz et al. 2000; Leung and Rice 2002).

In the face of environmental degradation, exposure to environmental harm may promote pro-environmental attitudes among Chinese citizens, which may subsequently be translated into pro-environmental behavior. However, pro-environmental behavior may also emerge as a direct response by people to environmental harm without the mediation of environmental attitudes. In this paper we test two hypotheses: exposure to environmental harm positively impacts pro-environmental behavior directly, and exposure to environmental harm positively impacts pro-environmental behavior through the mediation of environmental attitudes. We tested these hypotheses using multivariate analysis to control for potential correlations among environmental harm, pro-environmental attitudes, and socio-economic characteristics.

MATERIALS AND METHODS

We used a public dataset from the General Social Survey (2003) conducted at a national level in urban China jointly by the Survey Research Center of the Hong Kong University of Science and Technology and the Department of Sociology at Renmin University of China. This is the only dataset to date that measures environmental attitudes and behavior at the national level in China. A stratified random design was used to select respondents from urban Chinese citizens. The five strata were created to eliminate double

sampling and allow respondents from different sized cities to be selected.

The first strata consisted of 44 urban districts in central municipalities (Beijing, Tianjin, and Shanghai). The second strata consisted of 175 urban districts in provincial capital cities (24) and one central municipality—Chongqing. Provincial capital cities and newly established Chongqing generally had lower GDP per capita and lower percentages of non-agricultural population than cities in the first strata. The third strata consisted of 611 city districts and counties in Beijing, Tianjin, Shanghai and five provinces in the eastern region (excluding any districts from the first two strata). The fourth and fifth strata included 1136 and 835 city districts and counties in the central and western regions, respectively (excluding any districts from the first two strata). Tibet, Jilin, Guangdong, and Taiwan provinces, and Hong Kong and Macao Special Administrative Regions were not surveyed due to logistic constraints (Hong and Xiao 2007). Surveys were conducted through in-person interviews. Sample size was 5073 individuals ($\leq 3\%$ sampling error at the 95% confidence level, 98.6% compliance rate).

Measures

Respondents were asked whether they themselves or members of their family experienced environmental harm in the past (yes/no). In this survey, respondents were allowed to interpret environmental harm as any negative impact from environmental degradation. Seventy-seven percent of Chinese families reported that they had experienced environmental harm. Respondents were also asked if they had participated in six environmental behaviors during the previous year: separating garbage (sort garbage), discussing environmental issues with relatives or friends (environmental discourse), re-using plastic bags (re-use bags), participating actively in educational programs involving environmental knowledge (environmental education), participating in environmental activities held by non-governmental organizations (environmental volunteer), and participating in appeal and prosecution procedures dealing with environmental issues (environmental litigation). The most common environmental behavior that respondents participated in was re-using bags (71%), and engaging in environmental appeal and prosecutions was the least common (17%).

The New Environmental Paradigm (NEP) scale (Dunlap et al. 2000) was used to measure environmental attitudes. The NEP is designed to evaluate five aspects of an individual's environmental worldview: the realization of limits to growth, anti-anthropocentrism, belief in the fragility of the balance of nature, rejection of human exemptionalism, and belief in future eco-crisis. The respondents were

presented 15 statements and asked to select a value from a 5-point Likert-type scale to indicate the extent to which they agreed with each statement (from strongly agree to strongly disagree). Although some studies indicated that the NEP has multiple dimensions, e.g., balance of nature, limits to growth, and human domination of nature (Scott and Willits 1994; Dunlap et al. 2000), high internal consistency (Cronbach's $\alpha > 0.7$) is typically considered justification for aggregating all 15 statements in a scale that can range from 15 to 75 (a higher total score indicates a more pro-environmental worldview) (Dunlap et al. 2000). The NEP scale measured in this dataset had a mean value of 51.71, and had moderately high internal consistency (Cronbach's $\alpha = 0.71$). Previous studies suggested that members of environmental organizations consistently obtain higher NEP scores than the general public or non-environmental interest groups (Dunlap and Van Liere 1978; Widgren 1998; Dunlap et al. 2000; Dunlap and Michelson 2002). NEP score is often significantly correlated with environmental behavior and intentions, although the correlation coefficients tend to be low (Vining and Ebreo 1992; Scott and Willits 1994; Stern et al. 1995; Schultz and Oskamp 1996; Tarrant and Cordell 1997; Schultz and Zelezny 1998).

Respondents were also asked to indicate their status with respect to five socioeconomic variables: gender (female = 1, male = 0; mean = 0.52), age (mean = 43.51), education (years; mean = 10.44), and income [annual individual income in the previous year measured in ten-thousands of yuan (1 USD = 8.3 yuan when the interviews were conducted); mean = 1.00]. Including these variables in our analysis allows us to control for confounding effects and to compare results with previous research on NEP and environmental behavior (Scott and Willits 1994; Tarrant and Cordell 1997; Gong and Lei 2007). We also included marital status (married = 1, unmarried = 0; mean = 0.89) because family responsibilities may reduce discretionary time available for participating in pro-environmental behavior (Chen et al. 2011). Since occupational status may influence environmental behavior (Van Liere and Dunlap 1980; Ebreo and Vining 2001), we included two occupational variables: employment status (employed = 1, unemployed = 0; mean = 0.76) and employment rank (leadership position = 1, and 0 for others; mean = 0.26). People in leadership positions may participate more in pro-environmental behavior because they usually have higher levels of control over the behavior and corresponding outcomes (Ajzen 1991). Finally, we considered urban administrative level (0 for towns of counties, 1 for county level cities, 2 for non-capital cities above county level, and 3 for municipalities of the nation and capital cities of provinces). Compared to smaller cities, larger cities in China usually have more political power and resources to

promote pro-environmental behavior (State Bureau of Statistics of China 2003; Chen et al. 2011). About 44 % of the respondents lived in municipalities or provincial capital cities.

Analytical Methods

We used an ordinary least squares (OLS) regression model to explore the relationship between environmental attitudes (NEP) and the experience of environmental harm. We calculated Cronbach's alpha on pro-environmental behaviors to measure their internal consistency, and analyzed each pro-environmental behavior separately due to low internal consistency among different pro-environmental behavior scales (Cronbach's alpha = 0.61). We used a set of logistic regression models to evaluate the impacts of experiencing environmental harm on each of the pro-environmental behaviors with and without controlling for environmental attitudes (NEP). We also controlled for the same group of socioeconomic characteristics that were used in previous studies (Hong 2005; Hong 2006; Gong and Lei 2007; Chen et al. 2011) in these models. Significant impacts of environmental harm on pro-environmental behaviors without controlling for environmental attitudes indicate direct effects of environmental harm on pro-environmental behaviors. In addition to the direct effects, significant impact of environmental harm on environmental attitudes coupled with significant impacts of environmental attitudes on pro-environmental behaviors when environmental harm is also controlled indicate indirect effects of environmental harm on pro-environmental behaviors (Baron and Kenny 1986). We calculated the proportion of the effects of environmental harm on pro-environmental behaviors that were mediated by environmental attitudes by standardizing coefficients of regression models based on standard deviations of variables (Mackinnon and Dwyer 1993). Significance of mediation was tested by obtaining standard errors of direct and indirect effects of environmental harm on pro-environmental behaviors using 500 bootstrap replications.

We reported X-standardized odds ratios for logistic regression models. Standardized odds ratios are more comparable among the effects of independent variables because they represent the effects of a standard deviation change of the independent variables (Long and Freese 2006). The accuracy of logistic regression models was evaluated using a receiver operating characteristic (ROC) curve (Hanley and Mcneil 1982). The ROC curve is a plot of the sensitivity values (i.e., true positive fraction) versus their equivalent 1-specificity values (i.e., false positive fraction) for all possible probability thresholds. The area under the ROC curve (AUC) is a measure of model accuracy, and ranges from 0 to 1. An AUC score of 1

indicates perfect discrimination, an AUC score of 0.5 implies a prediction that is not better than random, and an AUC score lower than 0.5 implies a worse than random prediction. All statistical analyses were conducted using STATA 11 (STATA Corp., College Station, Texas, USA).

RESULTS

Respondents who had experienced environmental harm had more pro-environmental attitudes than respondents who had not experienced environmental harm (Table 1). The average NEP score of respondents who experienced environmental harm was 1.27 higher than that of respondents who had not experienced environmental harm. Several socioeconomic factors also influenced environmental attitudes (Table 1). NEP score was positively related to education level, income, employment status and employment rank, and was negatively related to age and female gender.

Experiencing environmental harm had a significant positive impact on five of the six pro-environmental behaviors (Table 2; Fig. 1). One standard deviation increase in experiencing environmental harm increased the odds of sorting garbage, environmental discourse, re-using bags, environmental volunteering, and environmental litigation by 1.15, 1.17, 1.08, 1.10, and 1.44 times, respectively. Experiencing environmental harm did not impact the odds of participation in environmental education. The impacts of socioeconomic characteristics on pro-environmental behaviors were similar to those reported in previous studies (Hong 2005; Hong 2006; Gong and Lei 2007; Chen et al. 2011).

Experiencing environmental harm was positively related with four of the six pro-environmental behaviors after

Table 1 Ordinary least squares (OLS) of environmental attitudes (NEP) on environmental harm and socioeconomic characteristics

Independent variables	Coefficients	Standard errors
Env-harm	1.268***	0.225
Gender	-1.038***	0.196
Age	-0.035***	0.009
Education	0.508***	0.031
Marital status	-0.395	0.366
Income	0.200*	0.084
Employment status	0.980***	0.243
Employment rank	0.532*	0.238
Urban administrative level	0.057	0.097
Constant	46.647***	0.604
Adjusted R^2	0.129	

$n = 5073$

* $p \leq 0.05$, ** $p \leq 0.01$, *** $p \leq 0.001$

Table 2 Logistic regression of six environmental behaviors on environmental harm and socioeconomic characteristics

Independent variables	Coefficients (X-standardized odds ratios)					
	Model 1 Sort garbage	Model 2 Env-discourse	Model 3 Re-use bags	Model 4 Env-education	Model 5 Env-volunteer	Model 6 Env-litigation
Env-harm	0.332*** (1.150)	0.370*** (1.169)	0.191** (1.084)	0.091 (1.039)	0.229** (1.102)	0.854*** (1.435)
Gender	0.229*** (1.121)	0.053 (1.027)	0.353*** (1.084)	0.065 (1.033)	0.071 (1.036)	-0.051 (0.975)
Age	-0.011*** (0.865)	-0.011*** (0.863)	0.006* (1.089)	-0.007* (0.909)	-0.012*** (0.857)	-0.003 (0.960)
Education	0.091*** (1.398)	0.141*** (1.683)	0.087*** (1.381)	0.136*** (1.652)	0.088*** (1.385)	0.065*** (1.271)
Marital status	-0.370*** (0.892)	0.221 (1.071)	-0.320* (0.906)	-0.133 (0.960)	-0.305* (0.910)	-0.063 (0.981)
Income	0.059* (1.075)	0.013 (1.016)	0.022 (1.027)	-0.035 (0.959)	-0.042 (0.951)	-0.022 (0.974)
Employment status	0.189* (1.084)	0.213** (1.095)	0.147 (1.065)	0.304*** (1.138)	0.203* (1.090)	0.094 (1.041)
Employment rank	0.132 (1.060)	0.386*** (1.184)	0.020 (1.009)	0.414*** (1.030)	0.227** (1.105)	0.433*** (1.209)
Urban administrative level	0.259*** (1.306)	0.012 (1.012)	0.251*** (1.295)	0.029 (1.030)	0.105** (1.114)	0.022 (1.023)
Constant	-1.851***	-0.944***	-0.937***	-1.843***	-1.960***	-2.967***
Likelihood ratio	420.17***	469.90***	261.74***	451.57***	227.70***	173.87
AUC	0.667	0.682	0.644	0.670	0.639	0.636

n = 5073

* p ≤ 0.05, ** p ≤ 0.01, *** p ≤ 0.001

controlling for NEP score (Table 3). Comparison of Tables 2 and 3 demonstrates that environmental harm no longer predicts re-using bags, and has a weaker relationship with environmental discourse when NEP is controlled for. NEP score had a significant positive impact on environmental discourse and re-using bags (Table 3). NEP score significantly mediated the impacts of environmental harm on environmental discourse and re-using bags (p values <0.001). Approximately 13.6 % of the effect of environmental harm on environmental discourse and 31.2 % of the effect of environmental harm on re-using bags were mediated by NEP score. AUC scores of logistic regression models ranged between 0.6 and 0.7, indicating moderate prediction accuracy.

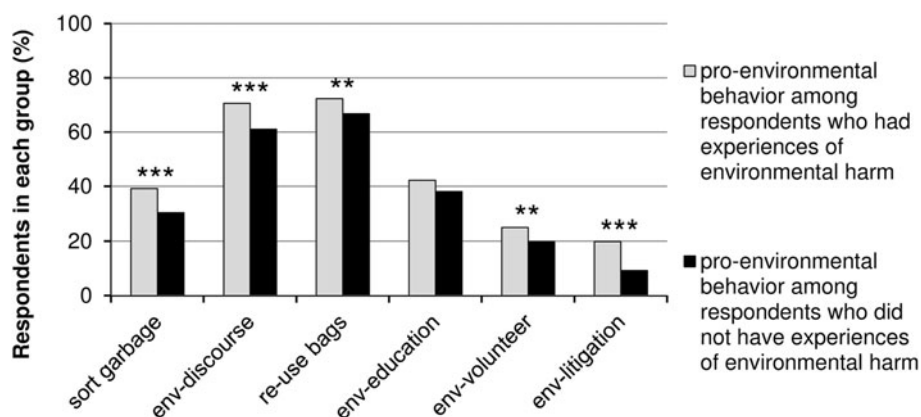
DISCUSSION

Study results supported the hypotheses that perceived exposure to environmental harm predicted pro-environmental behaviors both directly and indirectly via the mediation of environmental attitudes. The positive impact of environmental harm on NEP score corroborated limited research testing the relationship between exposure to environmental harm and environmental attitudes (Whitmarsh 2008). Significant positive impact of the NEP score on pro-environmental behavior reflects previous findings from China (Hong 2006; Gong and Lei 2007) and western countries (Buttel 1987; Kaiser et al. 1999; Dunlap et al. 2000).

Our results support the growing body of research suggesting pro-environmental behavior can be a response to environmental degradation (Brechin and Kempton 1994; Dunlap and Mertig 1995; Brechin 1999; Dunlap and York 2008). Specifically, negative experiences involving environmental harm may help individuals recognize the value associated with protecting the environment, which subsequently can be translated into behaviors aimed at avoiding or reducing such harm in the future (Whitmarsh 2008). Among different types of pro-environmental behaviors in this study, the impact of environmental harm on environmental litigation was the largest, probably because environmental litigation provides the most direct way for reducing/avoiding environmental harm. Our findings, however, go further to suggest experiencing environmental harm translates into more generic pro-environmental behaviors not necessarily tied directly to the specific forms of harm people experience.

Environmental attitudes mediated the effects of environmental harm on two pro-environmental behaviors (environmental discourse and re-using bags) that respondents could control themselves. This may be explained by the effect of perceived behavioral control on how people

Fig. 1 Frequency of participation in pro-environmental behavior among respondents who had and did not have experiences of environmental harm. Significant differences indicated by regression analysis (Table 2): ** $p < 0.01$, *** $p < 0.001$



choose to operationalize attitudes (Bamberg and Moser 2007). Urban Chinese may perceive that they can control re-using plastic bags and whether and how they discuss environmental issues, so their actions reflect their attitudes. For other behaviors requiring either facilitating support from the government (sort garbage) or governmental and social groups to organize activities (environmental education, environmental volunteering, and environmental litigation), urban Chinese may not perceive themselves as controlling the behavior, and thus may not choose to engage, despite having pro-environmental attitudes. Measuring environmental harm as a self-reported dichotomous variable allowed detection of important patterns in this study, but future research using direct observations of environmental harm or environmental harm scales based on multiple questions may provide better estimates of social responses to environmental harm in China.

Some socioeconomic factors were significantly related to pro-environmental attitudes and behavior. We found highly educated, young, female, and single respondents demonstrated more pro-environmental behaviors than their counterparts. Further, employed respondents holding leadership positions and residents in larger cities reported more environmentally oriented behaviors than their counterparts (Tables 2, 3). These results were consistent with environmental behavior studies in China (Harris 2006; Hong 2006; Gong and Lei 2007; Chen et al. 2011) and in western countries (Howell and Laska 1992; Scott and Willits 1994; Tindall et al. 2003; Hunter et al. 2004). Findings regarding the positive relationships between education, income, employment variables and the NEP score and the negative relationship between age and the NEP score (Table 1) were also consistent with previous studies on environmental attitudes in China (Hong 2005; Harris 2006; Hong and Xiao 2007) and in western countries (Buttel 1987; Dunlap et al. 2000).

While mixed results about the relationship between gender and environmental attitudes were found in early studies (McEvoy 1972; Hines et al. 1986–1987), recent

studies in western countries found females have more pro-environmental attitudes than males (Dietz et al. 1998; Vaske et al. 2001). In urban China, we found that males had more pro-environmental attitudes than females (Table 1), which may reflect males having more responsibility for public affairs while females have more responsibility for domestic affairs in most Chinese families (Hong and Xiao 2007; Xiao and Hong 2010). As such, females participated more than males in behaviors linked to households, sorting garbage, and re-using bags (Tables 2, 3). No significant differences between males and females were found for the other four pro-environmental behaviors potentially because higher levels of pro-environmental attitude among males reduced the gender gap in environmental behavior (Xiao and Hong 2010).

Although environmental quality has been described as a luxury good (Van Liere and Dunlap 1980; Scott and Willits 1994), our results suggest people in developing countries are willing to take pro-environmental actions when exposed to environmental harm (Dunlap and York 2008). Further, growing environmental awareness and increasingly pro-environmental attitudes among urban Chinese (Chen et al. 2011) suggest the mediating effect of environmental attitudes identified in this study will promote more environmental behavior in contexts where Chinese perceive they have some control over environmental outcomes. Although the overall lack of control over environmental degradation (Harris 2006) may hold back the urban Chinese people from responding environmental harm actively in some contexts, our results suggest direct exposure to environmental harm will encourage them to engage in pro-environmental behavior even when they may perceive lower levels of behavioral control. This finding reflects environmental justice research documenting communities and individuals tackling apparently insurmountable challenges (both in terms of opponents and the extent of environmental degradation) when exposed to environmental harm (Sandler and Pezzullo 2007). As government and non-governmental organizations increasingly facilitate

Table 3 Logistic regression of six environmental behaviors on environmental harm, NEP score, and socioeconomic characteristics

Independent variables	Coefficients (X-standardized odds ratios)					
	Model 1 Sort garbage	Model 2 Env-discourse	Model 3 Re-use bags	Model 4 Env-education	Model 5 Env-volunteer	Model 6 Env-litigation
Env-harm	0.322*** (1.146)	0.322*** (1.146)	0.134 (1.058)	0.082 (1.035)	0.231** (1.102)	0.862*** (1.439)
NEP	0.007 (1.056)	0.040*** (1.337)	0.048*** (1.415)	0.007 (1.052)	-0.001 (0.991)	-0.006 (0.958)
Gender	0.237*** (1.126)	0.097 (1.050)	0.412*** (1.228)	0.073 (1.037)	0.070 (1.036)	-0.058 (0.972)
Age	-0.011*** (0.868)	-0.010*** (0.876)	0.008** (1.114)	-0.007* (0.913)	-0.012*** (0.856)	-0.003 (0.957)
Education	0.087*** (1.377)	0.124*** (1.581)	0.067*** (1.281)	0.132*** (1.629)	0.089*** (1.389)	0.068*** (1.287)
Marital status	-0.368*** (0.893)	0.239 (1.077)	-0.306* (0.910)	-0.131 (0.960)	-0.305* (0.910)	-0.065 (0.980)
Income	0.058* (1.073)	0.005 (1.006)	0.013 (1.016)	-0.036 (0.957)	-0.041 (0.951)	-0.020 (0.976)
Employment status	0.182* (1.080)	0.179* (1.079)	0.107 (1.047)	0.297*** (1.135)	0.204* (1.090)	0.100 (1.044)
Employment rank	0.129 (1.058)	0.365*** (1.173)	-0.013 (0.994)	0.410*** (1.197)	0.228** (1.105)	0.436*** (1.210)
Urban administrative level	0.259*** (1.305)	0.009 (1.010)	0.254*** (1.299)	0.028 (1.030)	0.105** (1.114)	0.023 (1.024)
Constant	-2.197***	-2.829***	-3.212***	-2.169***	-1.905***	-2.691***
Likelihood ratio	423.01***	537.98***	358.05***	454.14***	227.76***	175.05
AUC	0.668	0.696	0.665	0.670	0.639	0.636

n = 5073

* p ≤ 0.05, ** p ≤ 0.01, *** p ≤ 0.001

people’s control over environmental behavior (Yang 2005; Economy 2007), progressively more environmental degradation can be mitigated through pro-environmental actions among urban Chinese citizens.

Acknowledgments We thank the General Social Survey of China project for providing the data. We thank two anonymous reviewers for their constructive criticisms on an earlier version of this paper. We gratefully acknowledge the financial support from National Science Foundation and Giorgio Ruffolo Fellowship in Sustainability Science at Harvard University, as well as AgBioResearch at Michigan State University.

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