Chapter 14

Environmental Concern in China: Mediating Effects of Generalized Trust and Social Integration

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Do social networks play mediating functions in the social dynamics of environmental concern? We examine the direct and mediating impacts of two social networks factors—generalized trust and social integration—on three dimensions of environmental concern (environmental sacrifice, perceived dangerousness of pollution, and household behavior) by analyzing data from the 2010 Chinese General Social Survey. Results show that generalized trust only has a direct, positive impact on the environmental sacrifice dimension, while social integration has direct, positive associations with all three dimensions of environmental concern. More importantly, social integration links six socio-demographic factors—age, gender, residential location, education, income, and subjective class—to all three dimensions of environmental concern. Generalized trust links three variables—age, residential location, and subjective class—only to the environmental sacrifice dimension. These findings add to the existing theoretical and empirical literature on the mediating role of social networks. They can also assist in proposing appropriate policies to raise people's awareness about environmental issues and promoting public support on pro-environmental policy.

Keywords: Environmental Concern; Social Networks; Generalized Trust; Social Integration

1. Introduction

Environmental issues are becoming serious and have been ranked as one of the most important global problem (Intergovernmental Panel on Climate Change 2014). As a result, environmentalism and environmental concern are becoming prominent worldwide. According to a review of the key topics in environmental sociology between 1990 and 2014, environmental concern emerges as the most prevalent topic in the corpus (Bohr and Dunlap 2018). Environmental concern refers to the degree to which people are aware of environmental problems and willing to contribute to a solution (Dunlap and Jones 2002). It is important to study public environmental concern because a higher level of environmental concern can promote policies aiming to reduce different types of pollution. Otherwise, the government might be less willing to take effective measures if the public express a lower level of concern about environmental issues. Studies have proliferated to identify and compare social determinants of environmental concern across countries (Hao 2016; Hao, Huang and Sloan 2018) or within countries (Clements, McCright, and Xiao 2013; Zhou 2013). However, only a few studies take a social network perspective and examine network-based social determinants of environmental concern (Bian 2012; Cho and Kang 2017; Macias and Williams 2016; Miller and Buys 2008; Munro 2013, 2014). Among various levels of complex social structures, social networks serve as a crucial mediating layer (Bian 1997; Burt 2009; Lin 2001a; Song 2011; Song 2015 Song, Pettis, and Piya 2017; Song and Pettis 2020). Nevertheless, we know little about how network-based factors mediate the impact of other commonly-used individual factors on one's environmental concern.

The purpose of this study is to investigate the direct and mediating impacts of two network-based factors (generalized trust and social integration) on one's environmental concern, using China as an example. According to scholars who have done extensive research on this topic, generalized trust reflects one's level of trust towards others, and social integration refers to the extent of participation in social networks (Lin 2001a; Song 2011; Cook 2005; Fukuyama 1995; Putnam 2000; Berkman et al. 2000; Moen, Dempster-McClain, William 1989). Understanding the

Chinese public's concern about the environment is important in a global sense. China is the largest CO_2 emitter in the world (Liu and Guan 2013), and this is accompanied by many pressing concerns including global warming, pollution, deforestation, and human-induced natural disasters (Economy 2010; Nielsen and Ho 2013; Shapiro 2016). Extant studies on China have identified a number of individual-level socio-demographic factors (e.g., education, income, and type of residence) associated with one's concern about the environment (Fan and Hong 2015; Hao 2014; Harris 2006; Liu and Mu 2016; Shen and Saijo 2008; Wang and Cheng 2017; Xiao, Dunlap, and Hong 2013; Xiao and Hong 2017; Yang and Huang 2018; Yu 2014). Despite decades of systematic research on social networks in China (Bian 2019; Gold, Guthrie, and Wank 2002; Shen 2016), few studies examine the effects of network-based factors (e.g., social integration, tie strength, and network resources) on environmental concern (Bian 2012; Munro 2013, 2014).

In the present study, we extract data from the 2010 Chinese General Social Survey (CGSS) and assess the impact of generalized trust and social integration on three different dimensions of environmental concern. More importantly, we examine the mediating roles of these two network-based factors that previous research does not take into consideration. In addition to their direct impacts, we argue that they can mediate the relationships between individual-level socio-demographic factors and environmental concern. Our findings can assist in proposing policies to help raise people's awareness about environmental issues and promote public support for pro-environmental policies.

We begin this paper by discussing theoretical connections among environmental concern, generalized trust, social integration, and other individual factors. Next, we introduce the 2010 CGSS data and our variable measures. Then, we report findings from the structural equation modeling (SEM) analyses. Finally, we discuss the results before suggesting directions for future research and policy implications.

2. Literature Review and Hypotheses

The existing literature shows that people's environmental concern depends on generalized trust and social integration (Cho and Kang 2017; Macias and Williams 2016; Miller and Buys 2008). According to the literature that we will review in details below, we expect that people with stronger generalized trust and more social integration are more likely to be concerned about environmental issues. Also, previous studies have identified numerous socio-demographic factors that can affect one's concern about the environment (Harris 2006; Liu and Mu 2016; Xiao, Dunlap, and Hong 2013). We expect that the network-based factors including generalized trust and social integration can mediate the relationships of socio-demographic factors with environmental concern. We expect the two social network factors to link most socio-demographic variables with environmental concern in a positive way. It is important to analyze the mediating effects, which help identify the network-based pathways between those commonly used socio-demographic factors and environmental concern.8 These two groups of variables might together exert a stronger influence on environmental concern, which can complement the existing literature on this subject. We provide theoretical rationale to support our expectation.

2.1. *Generalized Trust and Social Integration*

Social networks represent a theoretical perspective traced back to Durkheim's seminal work on suicide (Durkheim 1951). Despite the existing voluminous social network research, there has been limited research on the impact of social network factors on environmental concern (Macias and Williams 2016; Tam and Chan 2018). It remains unknown whether social network factors can affect environmental concern in China. Considering China's long-lasting collectivistic culture that highly legitimates interpersonal dependence, we may witness a strong effect of social network factors on environmental concern (Bian 2001; Lin 2001b; Song 2013). The available data allows us to examine the impact of two network-based concepts on environmental concern in China: generalized trust and social integration.

Arguably, generalized trust can promote cooperation even when rewards and outside enforcers are not present (Bell 2009; Hao 2015). Previous studies have found that trust can strengthen environmental concern and encourage people to devote their energy, time, and resources for the good of the broader community (Brehm and Rahn 1997; Fairbrother 2016; Hao and Wang 2018; Macias 2015; Pretty 2003). People who have more trusting relationships with others can be more conscious about and motivated for protecting public interests and solving environmental problems.

Various studies document the positive effect of trust on pro-environmental attitudes and behaviors. A study of the American GSS shows that people with higher levels of generalized trust are more willing to pay higher taxes, pay higher prices, reduce their standard of living, and do what is right in order to protect the environment (Macias and Williams 2016). One cross-national study on 60 countries finds that generalized trust is effective in translating environmental concern to pro-environmental behavior (Tam and Chan 2018). One comparative study across 30 countries reports that trust has a significant positive impact on environmental behaviors (Taniguchi and Marshall 2018). Similarly, a study across 35 countries demonstrates the positive association between trust and public support for environmental policies (Smith and Mayer 2018). Using the European and World Values Survey from 1999 to 2002, another study shows the positive impact of trust on participation in environmental activism and membership in environmental organizations (Sonderskov 2008).

The other network-based factor of interest, social integration, reflects the degree to which one (ego) is connected with network members (alters) (Song 2011; Berkman 2000; Moen, Dempster-McClain, and Williams 1989). Social integration can positively influence environmental concern through three possible pathways: network resources or accessed status (e.g., network members' status), social support, and informal social control. First, ego who shows a higher degree of social integration is more likely to reach and meet resource-richer network members or network members who occupy higher social status (Bian 2012; Song 2011). Higher-status people are more concerned with environmental issues and are more active in practicing environment-friendly behaviors (Dietz,

Stern, and Guagnano 2012; Gifford and Nilsson 2014; Jones and Dunlap 1992; Liu, Vedlitz, and Shi 2014; Van Liere and Dunlap 1980). Being surrounded by higher-status network members, ego will be more likely to develop environmental concerns and take actions for the purpose of environmental protection. Second, higher degrees of social integration can lead to the receipt of more social support from network members, particularly informational social support such as knowledge about environmental problems (Bian 2012; Lin and Ao 2008; Song, Son, and Lin 2011). Such valuable social support can draw more of ego's attention to environmental problems, behaviors, and protective solutions. Third, higher degrees of social integration can generate stronger informal social control (Bian 2012; Umberson 1987). Informal social control is mainly influenced by the general social norm. Considering that environmental protection is the prevalent norm in China, we expect that informal social control from network members can challenge ego's existing attitudes and lifestyles that conflict with pro-environmental perspectives and encourage ego to build up views and lifestyles that are environmentally friendly. Considering the three pathways, we contend that social integration has a positive association with one's environmental concern.

A few studies in general demonstrate the positive effects of social integration on environmental concern and environment-friendly behaviors in South Korea (Cho and Kang 2017), the United States (Macias and Williams 2016), and Australia (Miller and Buys 2008). Two studies investigate the impact of social integration on environmental concern in China (Munro 2013, 2014). Using the 2006 CGSS, Refs. 12 and 13 demonstrate the positive impact of social integration within neighborhoods on people's willingness to join environmental NGOs and their perception of pollution-related harm.

Overall, the aforementioned literature suggests that the way people think about and act towards others influences the way they think about and act towards the environment. We examine two direct-effect hypotheses from the social network perspective using data from China.

H1: Generalized trust is positively associated with environmental concern.
H2: Social integration is positively associated with environmental concern.

2.2. *Socio-Demographic Factors*

In addition to network-based factors, various socio-demographic factors also influence environmental concern and behaviors. For example, higher-educated people can obtain more knowledge about environmental problems, possess the skills to analyze environmental conditions, and further show greater commitment to protect the environment. In addition, people with higher status and better financial situations (e.g., having a higher income and social class, and full-time employment) are more likely to be satisfied with their basic material needs and thus become more concerned about higher-level needs such as the quality and health of the environment (Dietz, Stern, and Guagnano 1998; Gifford and Nilsson 2014; Jones and Dunlap 1992; Liu, Vedlitz, and Shi 2014; Van Liere and Dunlap 1980).

Furthermore, environmental concern increases with the enhancement of one's post-materialist values (Inglehart 1990; Inglehart and Welzel 2005; Inglehart 1995). Also, existing studies in China report that Chinese Communist Party (CCP) members are more likely to be concerned about the environment than nonmembers, mostly because the government's focus on environmental problems (Hao, Huang, and Sloan 2018; Xiao, Dunlap, and Hong 2013).

Among the social-demographic factors, most studies have identified the significant impact of age and have shown that the young are more concerned about the environment than the old (Booth 2017; Jones
Dunlap 1992). This may be because the younger group are more exposed to public discussions, political debates, and media reports about environmental issues, and they also have more opportunities for environmental education.

Previous studies also find that women have higher environmental concern than men due to the different value orientation (Davidson and Freudenburg 1996; Stern, Dietz, and Kalof 1993; Zelezny, Chua, and Aldrich 2000). Women are typically expected to care more about others and have a stronger altruistic orientation than men, while men are expected to have a stronger focus on their own economic success than women.

In addition, extant research in China shows that urban residents tend to be more concerned about the environment than rural residents (Chen et al.

2013; Xiao, Dunlap, and Hong 2013). Urbanites are exposed to various forms of pollution and may be more motivated to worry about the harmful effects of environmental problems than rural residents.

2.3. *Mediating Impacts of Generalized Trust and Social Integration*

A society is composed of different levels of social structures. Social networks serve as an important mediating level linking macro- and micro-levels of social structures (Bian 1997; Burt 2009; Lin 2001a; Song 2011; Song 2015; Song, Pettis, and Piya 2017; Song and Pettis 2020). Social network factors are endogenous. Their mediating functions have important implications, both theoretically and empirically. However, little is known about whether and how social network factors intervene between socio-demographic factors and environmental concern. Available data allow us to examine the mediating impacts of two network-based factors in China: generalized trust and social integration. We consider three groups of precursors of generalized trust and social integration in China: three demographic factors (age, gender, and urban versus rural residential location), four status variables (education, employment status, annual family income, and political capital), and one cultural variable (post-materialist value). As demonstrated in the above reviewed studies, these factors are common social determinants of environmental concern.

Gerontological theories, such as socio-emotional selectivity theory and the life span theory of control, expect older adults to manifest more generalized trust than younger ones due to their greater emphasis on emotionally meaningful goals and more practice of positive reappraisals (Carstensen 2006; Schulz and Heckausen 1996). This expectation is supported by empirical findings in China (Hu 2015; Li and Fung 2013). From a social stratification perspective, people occupying higher status and controlling more resources are more likely to trust others (Alesina and Ferrara 2002; Li, Pickles, and Savage 2005; Mewes 2014). In China, men, the Chinese Communist Party members, the employed, and people with higher social status are more trusting than women, noncommunist party members, the unemployed, and those with lower social status (Fan 2019; Li 2013; Sun and Wang 2012; Wu and Xie 2014). In addition, from a

cultural perspective, post-materialist values appear to promote trust (Inglehart and Baker 2000). Finally, hukou (urban versus rural) or the household registration system is a unique institutional factor in China. However, studies on generalized trust or other dimensions of trust in China tend to treat hukou or urban versus rural residential location as a control variable and report mixed results without explanations. One study, for example, uses data from the 2005 CGSS, and finds a negative association between urban hukou and neighborhood trust (Li 2013). Another study analyzes data from the 2012 China Family Panel Studies (CFPS) and reports a positive association between urban hukou and generalized trust (Wu and Xie 2014). We tentatively propose two competing explanations here. From the social stratification perspective, urban hukou or urban residential location is associated with the privileged access to various valuable resources, and thus is expected to be positively associated with generalized trust (Banfield 1958; Wu 2019; Zhou and Hu 2013). From the social network perspective, rural hukou or residential location tends to be associated with a familiar living environment with more strong or close ties (rather than weak ties or strangers) and thus is expected to be positively associated with generalized trust (Li 2013; Steinhardt 2012; Kipnis 1997).

Based on these prior studies, we propose the following hypotheses.

H3a: Generalized trust serves as a positive link between age and environmental concern.

H3b: Generalized trust serves as a positive link between gender (men versus women) and environmental concern.

H3c: Generalized trust serves as a positive link between the Chinese Communist Party membership and environmental concern.

H3d: Generalized trust serves as a positive link between employment status (being employed versus unemployed) and environmental concern.

H3e: Generalized trust serves as a positive link between social status and environmental concern.

H3f: Generalized trust serves as a positive link between subjective class and environmental concern.

H3g: Generalized trust serves as a positive link between post-materialist values and environmental concern.

H4a: From the social stratification perspective, generalized trust serves as a positive link between residential location (urban versus rural) and environmental concern.

H4b: From the social network perspective, generalized trust serves as a negative link between residential location (urban versus rural) and environmental concern.

Social integration has diverse forms. As described later, available data from the 2010 CGSS contain information on one form of social integration: social networking. Social disengagement theory expects older adults to show a lower degree of social connectedness (Cumming and Henri 1961; Marsden 1987; McPherson, Smith-Lovin, and Brashears 2006). This theory is supported in China (Li 2013). From a social stratification perspective, people holding higher status and possessing more resources are more active in social networking and engagement (Li 2013; Marsden 1987; McPherson, Smith-Lovin, and Brashears 2006; McPherson and Smith-Lovin 1986). In China, men, people with urban Hukou, the Chinese Communist Party members, and people with higher social status are more active in social networking and participation than women, those with rural Hukou, noncommunist party members, and those with lower social status (Li 2013; Bian 2004; Ni and Song 2003; Wang 2006; Zhang 2005; Zhang, Li, and Ruan 2004). Furthermore, from a cultural perspective, post-materialist values can encourage people to be more tolerant, respectful, and participatory and arguably more involved in social interaction with others (Inglehart and Baker 2000). In addition, there are competing perspectives on the impacts of marital status and parenthood status on social integration (Song 2012).

Therefore, we formulate the following hypotheses.

H5a: Social integration acts as a negative link between age and environmental concern.

H5b: Social integration acts as a positive link between gender (men versus women) and environmental concern.

H5c: Social integration acts as a positive link between residential location (urban versus rural) and environmental concern.

H5d: Social integration acts as a positive link between the Chinese Communist Party membership and environmental concern.

H5e: Social integration acts as a positive link between employment status (being employed versus unemployed) and environmental concern.
H5f: Social integration acts as a positive link between social status and environmental concern.
H5g: Social integration acts as a positive link between subjective class and environmental concern.
H5h: Social integration acts as a positive link between post-materialist values and environmental concern.

3. Data and Measurement

The data are extracted from the 2010 CGSS. The survey was carried out by the Survey and Data Center at Renmin University of China. It covered a nationally representative sample of adults in China, with 480 cities and villages as primary sampling units. The survey was administered through face-to-face interviews with a 71 percent response rate (see http://www.chinagss.org for technical details). A total of 3,672 respondents, which is a third of the whole sample, were randomly selected to answer questions on the environmental module. Many existing studies on environmental concern in China have used this dataset (Hao 2014; Xiao, Dunlap, and Hong 2013; Xiao and Hong 2017; Chen et al. 2013). Bian and Li (2012) discussed the details of the survey administration. The descriptive statistics for all variables measured in this study are presented in Table 1.

Table 1. Descriptive Statistics (N=3672)

		Mean	S.D.	Min	Max
Environmental Concern					
Environmental Sacrifice	willingness to pay higher prices	3.151	1.136	1	5
	willingness to pay higher taxes	2.935	1.125	1	5
	willingness to accept cuts in living standard	2.805	1.143	1	5
Perceived Dangerousness	pollution caused by cars	3.826	0.779	1	5
	pollution caused by industry	4.124	0.720	1	5
	pesticides and chemicals used in farming	3.575	0.917	1	5
	pollution of rivers, lakes, and streams	3.687	0.886	1	5
	temperature increase	3.708	0.819	1	5
	modifying the genes of certain crops	3.206	0.951	1	5
	nuclear power stations	3.362	1.035	1	5
Household Behavior	recycling	2.361	1.018	1	4
	buy fruits and vegetables without pesticides	2.074	0.942	1	4
	cut back on driving	2.079	0.919	1	4
	reduce energy	2.155	0.934	1	4
	save or reuse water	2.493	0.968	1	4
	avoid buying certain products	1.977	0.897	1	4
Network-Based Factors					
Generalized Trust	most people in the society can be trusted	3.491	1.079	1	5
Social Integration	the frequency of socializing with relatives	2.211	0.731	1	5
	the frequency of socializing with friends	2.311	0.961	1	5
	the frequency of general social networking	2.659	1.021	1	5
Control Variables					
Age		47.308	15.730	17	91
Gender		0.527	0.499	0	1
Residential Location		0.640	0.480	0	1
Marital Status		0.802	0.399	0	1
Parenthood		0.872	0.334	0	1
Education		2.367	1.070	1	5
CCP Member		0.132	0.338	0	1
Employment Status		0.615	0.487	0	1
Income (ln)		10.843	2.205	6	16
Social Class		4.046	1.766	1	10
Post-materialist Values		1.516	0.557	1	3

3.1. *Environmental Concern*

In line with previous studies (Hao, Huang, and Sloan 2018; Clements, McCright, and Xiao 2013; Xiao, Dunlap, and Hong 2013), we consider environmental concern along three dimensions: environmental sacrifice, perceived dangerousness of pollution, and environmental behavior. We assess these three dimensions using survey questions, where higher values indicate a more pro-environmental stance.

First, three questions about respondent's willingness to make sacrifices for the environment are used to compose the "Environmental Sacrifice" dimension. This dimension measures how willing respondents are to pay higher prices, to pay higher taxes, and to accept cuts in their standard of living to protect the environment. The response categories range from very unwilling=1 to very willing=5.

Second, seven questions about respondent's perceived danger caused by different types of pollution are used to capture the "Perceived Dangerousness" dimension. This dimension measures how respondents perceive the dangerousness of the following environmental issues: pollution caused by cars; pollution caused by industry; pesticides and chemicals used in farming; pollution of rivers, lakes, and streams; temperature increase caused by climate change; modifying the genes of certain crops; and nuclear power stations. The response categories range from not dangerous at all=1 to extremely dangerous=5.

Third, six questions about respondent's frequency in performing pro-environmental acts are used to measure the "Household Behavior" dimension. This dimension measures how often respondents engage in the following behaviors for environmental reasons: recycling; buying fruits and vegetables grown without pesticides or chemicals; cutting back on driving; reducing the energy or fuel one uses at home; saving or reusing water; and avoiding buying certain products. The response categories range from never=1 to always=4.

3.2. *Generalized Trust and Social Integration*

Generalized trust is measured by responses to one question: "Generally speaking, most people in the society can be trusted." Responses range from

"strongly disagree"=1 and "strongly agree"=5. This is a typical measure of generalized trust used in multiple studies that analyze data from the World Values Survey (Faribrother 2016), the European Social Survey (Sonderskov 2008), and the American GSS (Macias and Williams 2016).

Social integration is measured by three indicators: the frequency of socializing with relatives, the frequency of socializing with friends, and the frequency of general social networking in the past year. Responses are ordinal, with least frequent=1 and most frequent=5. A study of environmental concern based on the 2010 American GSS used a similar approach (frequencies of socializing with relatives, friends, and neighbors) to measure social integration (Macias and Williams 2016).

3.3. *Control Variables*

Our analysis controls for eleven socio-demographic variables: age, gender (1=female, 0= male), residential location (1=urban area, 0=rural area), marital status (1=married, 0=unmarried), parenthood status (1=have children, 0=not have children), education (range from 1 to 5 with "less than elementary school"=1 and "some college and above"=5), CCP member (1=member, 0=nonmember), employment status (1=employed, 0=unemployed), family income (transformed using a natural log to correct for its positive skewness), subjective class (range from 1 to 10 with "lowest social class"=1 and "highest social class"=10), and post-materialist values (coded on an index from 1 to 3).

The post-materialist values index is developed in Ref. 66 and composed by people's response to two survey questions asking about the top priority and the second priority they believe the country must address from four items. Giving people more say in government decisions and protecting freedom of speech are post-materialist while maintaining order in the nation and fighting rising prices are materialist. This index is calculated based on a mix of 4 materialist and post-materialist that respondents selected from the questions. The coding criteria is: 1=respondent did not choose a post-materialist item as a first or second priority, 2=respondent chose one post-materialist item as a first or second priority, and 3=respondent chose two post-materialist items as the first and second

priority. The index has been used in the environmental concern research in China (Hao, Huang, and Sloan 2018; Xiao and Hong 2017).

4. Structural Equation Modeling Analyses and Results

Confirmatory factor analysis is used to test the reliability of each dimension of environmental concern. Results show that the loadings of individual indicators are significant and reasonable in magnitude (very close to or above 0.50). Thus, the models have good fit. The confirmatory factor analysis results also indicate that the three social network indicators form a good measure of social integration. We then use the SEM approach to analyze how different dimensions of environmental concern are predicted by generalized trust, social integration, and socio-demographic control variables. We expect generalized trust and social integration to mediate the impact of socio-demographic variables on environmental concern (Acock 2013; Bollen 1989). The SEM diagram is presented in Figure 1.
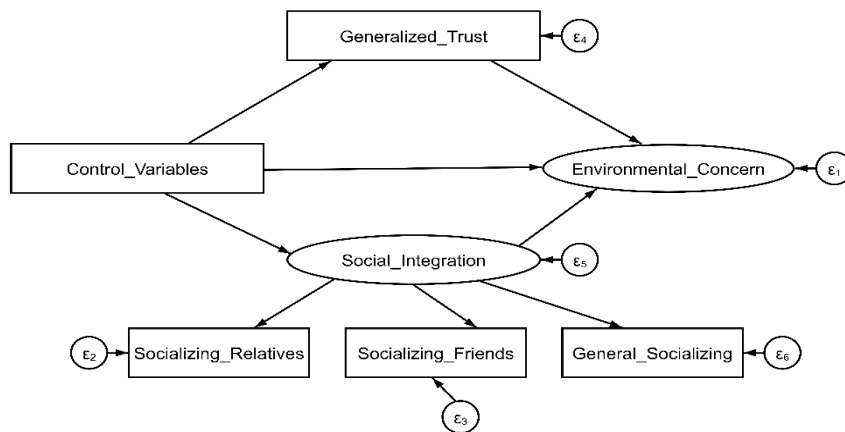

Fig. 1. Structural Equation Modeling Diagram

We estimate three SEM models and each model predicts one dimension of environmental concern. Previous environmental concern research in China has used the SEM approach for analyses (Hao, Huang, and Sloan 2018; Xiao, Dunlap, and Hong 2013; Xiao and Hong 2017). The standardized SEM coefficients are presented in Table 2, Table 3, and Table 4. Each table contains four columns to present results respectively on the total impacts of generalized trust, social integration, and control variables on environmental concern, the direct impacts of those variables, the indirect impacts of control variables through generalized trust, and the indirect impacts of control variables through social integration. The analyses are performed using Stata 16. The model-fit statistics reported at the bottom of Table 2, Table 3, and Table 4 show that the SEMs are a good fit because RMSEA values are below 0.05 and CFI values are above 0.90. The R-square values show that the manifest variables explain more variance in the environmental behavior dimension (R-square=0.156) and the perceived dangerousness dimension (R-square=0.136) of environmental concern than the environmental sacrifice dimension (R-square=0.057). We use SEM with maximum likelihood estimation for analysis. Instead of the listwise deletion, this approach provides an option to use all the information available in the presence of missing values on one or more variables. This method assumes joint normality and that the missing values are missing at random (Acock 2013). We also run the SEM by using the listwise deletion option as a robustness check and find similar results.

Table 2. Structural Equation Modeling Results about the Impact of Generalized Trust, Social Integration, and Control Variables on Environmental Sacrifice

	Total Impact	Direct Impact	Indirect Impact Mediated by Generalized Trust	Indirect Impact Mediated by Social Integration
Generalized Trust	0.085***	0.085***	-	-
Social Integration	0.093***	0.093***	-	-
Age	-0.026	-0.022	0.012***	-0.016**
Female	-0.020	-0.014	0.001	-0.007**
Urban Residents	0.032	0.027	-0.006**	0.011**
Married	0.004	0.002	0.003	-0.001
Parenthood	0.003	0.007	-0.001	-0.003
Education	0.046	0.031	0.000	0.015**
CCP Member	0.086***	0.077***	0.003	0.005*
Employed	-0.016	-0.019	0.002	0.001
Income (ln)	-0.020	-0.025	-0.001	0.006*
Social Class	0.136***	0.117***	0.006**	0.013**
Post-materialist Values	0.055**	0.051*	-0.002	0.005*
Model Fit Statistics				
CFI=0.973	RMSEA=0.031		R-square=0.057	

*p<0.05; **p<0.01; ***p<0.001

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Table 3. Structural Equation Modeling Results about the Impact of Generalized Trust, Social Integration, and Control Variables on Perceived Dangerousness

	Total Impact	Direct Impact	Indirect Impact Mediated by Generalized Trust	Indirect Impact Mediated by Social Integration
Generalized Trust	-0.024	-0.024	-	-
Social Integration	0.059*	0.059*	-	-
Age	-0.014	0.000	-0.003	-0.010*
Female	0.025	0.030	0.000	-0.004*
Urban Residents	0.158***	0.149***	0.002	0.007*
Married	0.020	0.021	-0.001	-0.001
Parenthood	-0.029	-0.027	0.000	-0.002
Education	0.221***	0.212***	0.000	0.009*
CCP Member	0.017	0.015	-0.001	0.003
Employed	-0.046*	-0.046*	0.000	0.001
Income (ln)	0.048*	0.044*	0.000	0.004*
Social Class	0.026	0.019	-0.002	0.008*
Post-materialist Values	0.005	0.002	0.000	0.003
Model Fit Statistics				
CFI=0.905	RMSEA=0.040		R-square=0.136	

*p<0.05; **p<0.01; ***p<0.001

Table 4. Structural Equation Modeling Results about the Impact of Generalized Trust, Social Integration, and Control Variables on Household Behavior

	Total Impact	Direct Impact	Indirect Impact Mediated by Generalized Trust	Indirect Impact Mediated by Social Integration
Generalized Trust	0.017	0.017	-	-
Social Integration	0.074**	0.074**	-	-
Age	0.048*	0.058*	0.002	-0.013**
Female	0.002	0.007	0.000	-0.005*
Urban Residents	0.231***	0.223***	-0.001	0.009**
Married	0.021	0.022	0.001	-0.001
Parenthood	0.024	0.027	0.000	-0.003
Education	0.199***	0.187***	0.000	0.012**
CCP Member	0.022	0.017	0.001	0.004*
Employed	-0.056**	-0.058**	0.000	0.001
Income (ln)	-0.007	-0.012	0.000	0.005*
Social Class	0.081***	0.069***	0.001	0.011**
Post-materialist Values	0.035	0.032	0.000	0.004*
Model Fit Statistics				
CFI=0.952	RMSEA=0.031		R-square=0.156	

*$p<0.05$; **$p<0.01$; ***$p<0.001$

The analyses produce several findings related to two network-based factors as well as control variables. First, consistent with the direct effect hypotheses (Hypothesis 1-2), there is evidence for the direct impacts of generalized trust and social integration on different dimensions of environmental concern (see Tables 2-4). Generalized trust has a significant positive impact on only one dimension of environmental concern: environmental sacrifice. Social integration exerts significant positive effects on all three dimensions of environmental concern. In other words, people who are more trusting and active in social networking are more willing to make sacrifice for the environment. Additionally, people who have higher degrees of social integration are also more likely to perceive the dangerousness of different forms of pollution and take pro-environmental behaviors. Although varying by the dimensions of environmental concern, these significant findings support Hypotheses 1-2.

Second, in terms of the direct impacts of control variables, people who are CCP members, have a higher subjective class, and have more post-

materialist values are more willing to make a sacrifice for the environment. In addition, people who live in urban areas, have more education, are unemployed, and have higher income are more likely to perceive the danger of environmental problems. Furthermore, people who are older, live in urban areas, have more education, are unemployed, and have a higher subjective class are more likely to take pro-environmental behaviors. Gender, marital status, and parenthood status do not have significant impact on all three dimensions of environmental concern.

Third, generalized trust is a significant mediator for the associations of age, urban residence, and subjective class with only one dimension of environmental concern: environmental sacrifice (see Table 2). Subjective class plays not only a direct role but also an indirect role. People with a higher subjective class are more willing to sacrifice for the environment than those with a lower subjective class, partly through the mechanism of generalized trust. Although age and residential location do not exert significant direct effects on environmental sacrifice, these variables play indirect roles through generalized trust. Older people and rural residents are more trusting than younger ones and urban residents, and people who are more trusting are more willing to sacrifice for the environment. These findings are consistent with three mediating effect hypotheses (Hypothesis 3a and 3f, and Hypothesis 4b). Results support the social network perspective but not the social stratification perspective on the mediating effect of generalized trust on the association between residential location and environmental concern.

Finally, social integration is a significant mediator for the relationships of age, gender, urban residence, education, income, and subjective class with all three dimensions of environmental concern, and the associations of CCP members and post-materialist values with two dimensions of environmental concern (environmental sacrifice and household behavior). People who have a Communist Party membership, a higher subjective class, and greater post-materialist values are more willing to make a sacrifice for the environment than non-Communist Party members, those with a lower subjective class, and lower post-materialist values partly through the pathway of social integration (see Table 2). Although exerting no significant direct effects on the sacrifice dimension of environmental concern, five socio-demographic control variables have significant

indirect effects through social integration. The younger, men, urban residents, and people with more education and income have higher degrees of social integration than the older, women, rural residents, and those with less education and income, and further those with higher degrees of social integration are more willing to sacrifice for environmental protection.

People who live in urban areas and have more education and income are more likely to perceive the dangerousness of different forms of pollution than those living in rural areas and achieving less education and income partly through the mechanism of social integration (see Table 3). Although having no significant direct associations with the perceived dangerousness dimension of environmental concern, three control variables have significant indirect effects through social integration. The younger, men, and those with a higher subjective class report higher degrees of social integration than the older, women, and those with a lower subjective class, and further those with higher degrees of social integration are more likely to recognize the dangerousness of environmental pollution.

People who are younger, live in urban China, and have more education and a higher subjective class are more likely to take pro-environmental behaviors than those who are older, dwell in rural China, obtain less education, and identify with a lower class partly through the pathway of social integration (see Table 4). Although exerting no significant direct impacts on pro-environmental behaviors, four control variables play indirect functions through social integration. Men, the Communist Party members, people with more income, and people holding stronger post-materialist values manifest higher levels of social integration than women, non-Communist Party members, those with less income, and those internalizing weaker post-materialist values, and further those with greater degrees of social integration are more likely to practice pro-environmental behaviors. Overall, although varying by the three dimensions of environmental concern, the significant findings here are consistent with almost all mediating effect hypotheses (Hypothesis 5a-5d, Hypothesis 5f-5h), with the exception of employment status. Employment status does not have an indirect effect through social integration on environment concern.

5. **Discussion and Conclusion**

This present study expands our knowledge of social determinants of environmental concern from a social network perspective. Using nationally representative data from China, it demonstrates that two network-based factors—generalized trust and social integration—can exert not only direct positive impacts on environmental concern but also, more importantly, mediating effects. Social integration has more consistent direct associations with environmental concern than generalized trust. Social integration has positive effects on all three dimensions of environmental concern while generalized trust does so only on the sacrifice dimension. More importantly, social integration plays a stronger and more consistent mediating role than generalized trust. Social integration links six factors—age, gender, residential location, education, income, and subjective class—to all three dimensions of environmental concern and another two factors—the Communist Party membership and post-materialist values—to the sacrifice and household behavior dimensions of environmental concern. Generalized trust links three variables—age, residential location, and subjective class—only to the sacrifice dimension of environmental concern.

   These findings add to the existing theoretical and empirical literature on the mediating role of social networks in the production of various outcomes such as status attainment and health (Bian 2012; Bian 1997; Burt 2009; Lin 2001a; Song 2011; Song, Pettis, and Piya 2017). Meanwhile, prior studies analyze how social network characteristics and sociodemographic factors directly influence one's environmental concern. Going beyond the prior work, this present study contributes to identifying the mediating role of social networks for the impacts of sociodemographic factors. The influence of one's socio-demographic variables on environmental concern can be channeled through one's social networks. Furthermore, these findings from China might also apply to other countries. They can promote the mediating-effect research on public environmental concern in other societies.

   In order to achieve a fuller picture on the social network perspective on social determinants of environmental concern, several promising directions for future research deserve attention. First, this present study

analyzes the two network-based factors at the individual level. Future research should examine how generalized trust and social integration measured at the aggregate levels (e.g., cities and provinces) may affect environmental concern. Second, this study analyzes cross-sectional data. Future research should collect and employ panel data for the purpose of stronger causal inferences. Third, future research needs to investigate how other network-based factors, such as social support and informal social control, may play direct and indirect roles for environmental concern and how these factors may be the mediating pathways for the positive effects of social integration and generalized trust. Fourth, future studies on social network factors measured through network instruments such as the position generator or the name generator can complement the analyses of this present study. Finally, as mentioned earlier, China embraces collectivistic culture (Bian 2001; Lin 2001b; Song 2013). Future comparative research should analyze data from other societies and examine whether findings in this study are generalizable across society and culture.

Furthermore, findings of this study have policy implications. Generalized trust and social integration can increase people's compliance and cooperation (Bell 2009; Hao 2015). Our results align well with previous studies that find factors such as income, education, and political party affiliation influence one's environmental concern. Building on this literature, we find that network-based factors can directly raise environmental concern and indirectly mediate the impact of other variables on one's environmental concern. Thus, enhancing generalized trust and social integration can promote environmental concern. More efforts should be focused on building social integration through different networking, collective activities. This is because social integration has a direct impact on all three dimensions of environmental concern and can also mediate the impact of most socio-demographic variables. Furthermore, specific attention may be given to women who have less trust and less engagement in social integration. Thus, strategies such as public discussion, community initiatives, and platforms for common actions that build environmental concern using network-based factors may increase people's willingness to sustain pro-environmental actions as environmental concern becomes widespread. One step further, the public

awareness of environmental issues can translate into driving forces that promote government policies and actions. As a result, the government might become more willing to invest in environmental protection and develop additional regulations to reduce pollution.

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