

An Empirical Comparison of Environmental Behaviors in China's Public and Private Sectors

Empiryczne porównanie zachowań prośrodowiskowych w sektorach publicznym i prywatnym w Chinach

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Abstract

The distinctive public-private sector segmentation in China provides a unique opportunity to assess the impacts of environmental education. Considering that the ideological education of ecological civilization has long been mandatorily enforced in the public sector, including government agencies and state-owned enterprises (SOEs), ahead of the private sector, this research centers on the question of whether environmental behaviors are influenced by sector affiliation in China. We carried out an empirical comparison using data from the 2013 version of the *Chinese General Social Survey*. The results showed that public sector and state-owned enterprise affiliations were both positive predictors of environmental behaviors. However, private environmental behaviors were weak in SOEs and environmental knowledge had an insufficient impact on public environmental practices. These findings suggest that a more efficacious environmental education system is needed in public sectors as well as for the general public.

Key words: pro-environmental behavior, private and public environmental behaviors, government agencies, state-owned enterprises (SOEs), environmental knowledge, environmental ideology education

Streszczenie

Charakterystyczna segmentacja sektora publiczno-prywatnego w Chinach stanowi wyjątkową okazję do oceny wpływu edukacji ekologicznej. Biorąc pod uwagę, że edukacja ekologiczna od dawna jest obowiązkowo wymagana w sektorze publicznym, w tym w agencjach rządowych i przedsiębiorstwach państwowych, przed sektorem prywatnym, badania koncentrują się na pytaniu, czy na zachowania środowiskowe wpływa przynależność do danego sektora. Przeprowadziliśmy porównanie empiryczne z wykorzystaniem danych z chińskiej wersji *General Social Survey* z 2013 roku. Wyniki pokazały, że powiązania sektora publicznego i przedsiębiorstwa państwowego (SOE) były w obu przypadkach pozytywnymi predyktorami zachowań środowiskowych. Jednak prywatne zachowania środowiskowe były słabe w przedsiębiorstwach publicznych, a wiedza o środowisku nie miała wystarczającego wpływu na publiczne praktyki środowiskowe. Wyniki te sugerują, że bardziej skuteczny system edukacji ekologicznej jest potrzebny zarówno w sektorach publicznych, jak i dla ogółu społeczeństwa.

Słowa kluczowe: zachowanie prośrodowiskowe, prywatne i publiczne zachowanie środowiskowe, agencje rządowe, przedsiębiorstwa państwowe (SOE), wiedza środowiskowa, edukacja ekologiczna

1. Introduction

China has witnessed severe environmental degradation over previous decades. Concern about environment issues is becoming increasingly common among the Chinese public, and environmental behaviors have gained a great amount of attention from various stakeholders. Studies regarding environmental behaviors in China have been based around the perspectives of sociology (Chen et al., 2011; Tilt, 2009), education (He et al., 2011; Wang et al., 2013), business (Chan, 2001; Fryxell and Lo, 2003), media (Zhao, 2012), politics (Xie, 2012; Stalley and Yang, 2006) as well as public policy (Harris, 2008). In terms of the individual dimension, multiple socio-demographic factors, e.g., age (Johnson et al., 2007), gender (Xiao and Hong, 2010), and residency (Chen et al., 2011; Yu, 2014), are extensively being examined to identify the key determinants and driving mechanisms of environmental behaviors.

A specific characteristic of the Chinese society, however, seems to have been neglected by the existing literature. The dual structure of public-private sector separation has been a crucial outcome of the marketization process of the country. In China, all employees were affiliated with public sectors before the reform and opening-up in 1978. This proportion has declined synchronously with the market reform, and the rate has been below one-third since 2003 (Zeng, 2013). Presently, people who work in the public sector, usually called *inside the official system* (tizhinei in Chinese), enjoy comparatively more economic benefits, greater job security, and more social privileges than those in the private sectors, i.e., *outside the official system* (Sheldon et al., 2011). The identity differentiations between the public and private sectors have become potential forces regarding many aspects in China (Peng, 1992; Démurger et al., 2012; Tang et al., 2013), including the national environmental protection strategy as well as individuals' environmental behaviors.

The public sector basically has two components. One includes the Communist Party of China (CPC) and government agencies. As the founding and ruling political party in China, CPC sketches and implements its environmental protection strategy following the classical roots of Marxian theory (Foster, 2017). The *ecological civilization* concept, firstly delivered in 2007 at the 17th CPC National Congress, was re-emphasized at the 18th CPC National Congress and adopted into the revised CPC Constitution five years later (Pan, 2016; UNEP, 2016). The 19th CPC National Congress specifically launched initiatives to develop eco-friendly Party and government offices, as well as eco-friendly communities, transport services, etc. The learning and implementation of the congress reports has been a primary political task for government employees, especially CPC members. The idea was added into the latest amendments of the constitution of the country in early 2018, which has

encouraged the people throughout the nation to pursue the goal of ecological civilization. Thus, environmental protection was made mandatory for employees from government agencies over a decade ahead of the general public. Effects related to environmental behaviors might have emerged as a consequence.

State-owned enterprises (SOEs) are the other core component of China's public sector. In China, SOEs have a huge value – 29.2 trillion USD as of 2015, which is over ten times the aggregation of SOEs in all OECD countries (OECD, 2017). Meanwhile, SOEs account for 15 percent of China's total non-agriculture employment, which is approximately six times higher than the OECD average (National Bureau of Statistics of China, 2016; OECD, 2017). On account of the administrative monopoly and natural advantages in certain areas, China's SOEs have produced remarkable economic performances and social impacts (Hubbard and Williams, 2017). The central government strictly controls these enterprises through the State-owned Assets Supervision and Administration Commission of the State Council (SASAC) which appoints CEOs and makes strategic decisions. All SOE officials and employees, equally to those in government agencies, are subject to the same political rules regarding the enforcement of the ecological civilization spirit. Meanwhile, in terms of enterprise operation and management, they are required to balance economic, environmental, and social objectives, particularly, the sustainability goals of the recent ecological civilization campaign (Zhu et al., 2016). Therefore, SOE personnel could conceivably have potential effects on environmental behaviors.

Public-private sector segmentation, a distinguishing feature in China, has thus provided the political and economic backgrounds of the environmental protection strategy in China's authoritarian regime. Though similar pro-environmental initiatives can be found in other units, e.g., schools and communities, most of these are voluntary instructions instead of mandatory requirements. For individuals within the public sectors, potential influences on their environmental behaviors will be generated from these, since the ideological education and execution of ecological civilization has been compulsory for several years. A systematic statistical investigation, however, has scarcely been addressed. In terms of related studies in China, Zhou et al. (2013) chose the case of a local environmental protection bureau to characterize their behavioral strategies; however, they did not fully investigate the personal behavioral patterns. Duan and Hu (2014) made an interesting comparison between local officials within and outside the climate field in regard to their concerns and activities with climate change issues. Graves et al. (2013) tested the factors of employees' environmental behaviors using a few hundred samples from four global organizations in China. A similar study con-

nected the environmental involvement of managers and workers with firms' environmental performances (Chen et al., 2015). Chun (2009) compared the environmental values of employees from state-owned and private firms with a sample of workers from seven energy companies in Shanxi province, China. Nevertheless, to the best of our knowledge, there have been few relevant research studies based on national samples involving a thorough examination linking the environmental behaviors and the public-private sector separation in China.

Given the scant amount of literature, we offer empirical evidence on the interplay of sector affiliation and environmental behaviors in China. The basic mechanism behind this is that if individuals from the public sector faced intensive ideological education on environmental protection as well as practical implementation in their workplaces and decision-making, then they could accordingly adapt their environmental behaviors to some extent. To fill the missing link between macro and micro dimensions, an empirical research effort using a large-scale survey was conducted in order to assess the association between the use of ideological education on environmental strategies in the public sector and the individuals' subsequent environmental actions. Following an interpretation of the theoretical background on environmental literacy and environmental education, we present the data collected and the empirical results. The article concludes with a discussion.

2. Theoretical Background

Considering the roots of the environmental protection strategy and the potential influences of environmental education in China's public sector, we placed the issue of environmental behaviors under a theoretical framework of environmental literacy. We believed that the disparities between sector affiliations would be reflected along with the logical chain of environmental literacy.

The idea of environmental literacy has been evolving for decades (Harvey, 1977; Hart, 1981; Roth, 1992; McBride et al., 2013), and various components have been measured in different assessment projects (Hollweg et al., 2011; McBeth and Volk, 2009). However, the core factors covered in these theoretical and empirical studies on environmental literacy are unanimous. The first element is the environmental sensitivity which reflects the awareness and concerns of individuals or groups on environmental risks. The second element is environmental knowledge which includes understanding, experience, or skills related to environmental issues. The third element is behavioral strategies – the ultimate outcome of the first two elements that involves actions and participation in solving environmental problems (UNESCO-UNEP, 1976; Roth, 1992). In addition, sociodemographic factors that measure personal competence and social contexts are con-

tained in this interactive structure (Simmons, 1995; Hollweg et al., 2011). By using these common features of environmental literacy, the sensitivity-behavior and knowledge-behavior interrelations under the behavior model of environmentally responsible citizenship can be generalized. The goals and objectives of successful environmental education and green society are achieved based on the components of environmental sensitivity and environmental knowledge. Environmental sensitivity provides the external forces, while environmental knowledge contributes to internal pro-environmental behaviors. Most studies that have applied the environmental literacy framework have been assessment projects on certain groups. The North American Association for Environmental Education (NAAEE), for example, supported an assessment on middle schools (McBeth and Volk, 2009). National surveys of environmental literacy were also conducted on elementary and high school students in other countries, e.g., South Korea (Shin et al., 2005). In addition to the assessments on students from elementary and middle schools, similar projects have been undertaken on university students (Fang et al., 2018) and teachers (Patrick, 2012). However, investigations on professionals, especially those working in governments and private firms, have rarely been conducted.

A unique form of environmental literacy, based on the environmental ideological education within public sectors in a typical country, such as China, could follow the same theoretical framework but simultaneously provide better understanding of the issue of environmental education. Firstly, for employees in the public sector, environmental sensitivity nor knowledge cannot be acquired merely through classroom instruction; life experiences and real-world policy practices have contributed to the development of individuals' environmental sensitivity and knowledge that has led to their pro-environmental attitudes and behaviors. Secondly, environmental education at the primary and secondary stages is transitory and voluntary, while adults' environmental literacy gained from the obligatory ideological propaganda might be more persuasive. Thirdly, since the public sector in China could have a significant influence on the national environmental strategy, its development of personal environmentally responsible behaviors brought by the professional environmental education system deserves specific identification.

Therefore, the testing of affiliation factors that affect environmental performances in China, will enrich the classical environmental literacy framework. We extend the environmental literacy literature and offer fruitful implications for both scholars and policy makers by examining a distinguishing aspect of environmental ideology education in the Chinese context. Based on the continuous and intensive education on environmental protection that has taken place in China's public sector during previous years, we preliminarily hypothesize that higher levels of envi-

ronmental behaviors exist among individuals in the public sector.

3. Data and Measures

3.1. Data

The data for this study was extracted from the 2013 version of the *Chinese General Social Survey* (CGSS, 2013). The environmental module of this database has been widely used in the literatures to assess environmental attitudes and behaviors from various angles (Duan and Sheng, 2018; Wang and Cheng, 2017; Yang and Huang, 2018). The latest open database is the 2015 version which became accessible in early 2018; however, the environment module was replaced with an energy module, which could not be used to capture the desired environmental concepts. More importantly, to the best of our knowledge, a comparison perspective of environmental issues between the public and private sectors has not been investigated using the CGSS 2013. The data collected in 2013 could still present a clear picture of the actual effects on environmental behaviors from years of environmental education in the public sector, since the ecological civilization concept was first proposed in 2007.

Table 1. The Distribution of the Public and Private Sectors in the *Chinese General Social Survey* (CGSS) 2013

	Frequency	Percent
Public Sectors	1,446	21.02
CPC (the Communist Party of China) and government agencies	169	2.46
Public service units	539	7.84
Social organizations (CPC/government-funded), residential/village committees	111	1.61
State-owned/collective-owned enterprises	627	9.11
Private Sectors	5,433	78.98
Farming	2,430	35.32
Self-employed	1,624	23.61
Non-governmental social organizations	13	0.19
Private/foreign enterprises	1,366	19.86

The CGSS 2013 data set has a sample size over 11,000, while only 60 percent of this data was valid for this specific study, since numerous respondents did not disclose their occupation. Among the 6,879 samples containing information on occupation, as listed in Table 1, approximately one-fifth were from the public sector. Besides the CPC and government agencies and SOEs, the public service units (shiyedanwei in Chinese) and residential/village committees fall into two special categories in China. Public service units are public service providers affiliated with all levels of government agencies (World Bank, 2005). The residential/village committees affiliated with township governments and municipal street offices, are grassroots organizations that manage pub-

lic affairs and offer social services for communities (Choate, 1997, 1998). The private sector includes farming, self-employed individuals, non-governmental social organizations, and private and foreign enterprises.

It is also worth noting the two different attributes of enterprises in the sample. One is state-owned and the other is non-state-owned. Since most pollution is directly caused by the activities of enterprises, an extra examination of the enterprise sample was necessary. Thus, we designed a comparative study between public enterprises (SOEs) and private enterprises.

3.2. Dependent Variables

The core dependent variables in this study were characterized by a series of environmental behaviors. Ten items describing specific green activities were assessed in the CGSS 2013 questionnaire: (1) waste sorting; (2) discussing environmental topics with families and friends; (3) bringing own basket or bag when shopping; (4) reusing plastic bags; (5) donating to environmental protection initiatives; (6) interest in environmental information on the radio, television or in newspapers; (7) participation in environmental activities organized by the government; (8) participation in environmental activities organized by non-governmental organizations; (9) planting and maintaining trees or green spaces at their own expense; and (10) participating in complaints and appeals related to environmental issues. The respondents were required to choose *never/occasionally/frequently* when claiming whether they had been involved in any of these activities in the recent year. Codes of never = 1, occasionally = 2, and frequently = 3 were respectively given according to respondents' choices.

Table 2. Rotated Factor Loadings

Variables	Factor 1	Factor 2
EB 1	0.0281	<i>0.2361</i>
EB 2	0.0409	<i>0.2518</i>
EB 3	-0.1450	<i>0.4121</i>
EB 4	-0.1808	<i>0.4208</i>
EB 5	<i>0.2155</i>	0.0155
EB 6	0.0965	<i>0.1883</i>
EB 7	<i>0.2501</i>	0.0244
EB 8	<i>0.2956</i>	-0.0489
EB 9	<i>0.2685</i>	-0.1540
EB 10	<i>0.2890</i>	-0.1262

Note: EB = environmental behavior. Cronbach's alpha = 0.76. Method: Principal-Component Factors. Rotation: Orthogonal Varimax (Kaiser on). Kaiser-Meyer-Olkin measure of sampling adequacy = 0.8181.

We used a factor analysis to generate more concentrated scores of environmental behaviors. The extraction of these factors was done to avoid the potential issues from highly correlated variables. The results of the rotated factor loadings are presented in Table 2. Two components are suggested which are marked in italics. Based on the content of each environmental behavior (EB) and inspired by related

studies (Hadler and Haller, 2011; Sherkat and Ellison, 2007), we named the two factors private environmental behaviors (EB 1,2,3,4, and 6) and public environmental behaviors (EB 5,7,8,9, and 10). The distinction between *private* and *public* behaviors was mainly determined by the number of participators: private behaviors are mostly personal or within a family, while public behaviors involve certain organizations or even political groups. Similarly, the United Nations proposed the idea of individual and collective actions on environmental challenges (UNESCO-UNEP, 1976).

The final scores of the two dependent variables were normalized on a range of 0 to 100. Overall, the private environmental behavior scores (mean = 49.48, SD = 20.22) were evidently higher (mean = 15.79, SD = 15.13). The scores also revealed differences between the public and private sectors. The public sector showed more enthusiasm for public environmental behaviors (mean = 22.30, SD = 17.54) than the private sector (mean = 14.05, SD = 13.92). It was also shown that the public sector is more active in terms of private environmental behaviors (mean = 58.68, SD = 19.85) compared with the private sector (mean = 47.03, SD = 19.61).

3.3. Independent Variables

All independent variables excluding the public/private sector are summarized in Table 3. We firstly incorporated a control variable, Perceived Environmental Threat, to identify people's sensitivity to environmental harm. This variable was derived from a set of 12 items describing various common environmental hazards, e.g., air pollution, water pollution, and desertification, following a 5-point scale ranging from 5 = *extremely serious* to 1 = *not serious at all* to obtain the respondents' personal feelings. After aggregating and normalizing the scores for those items, we obtained the Perceived Environmental Threat index within the interval of 0 to 100 (Cronbach's alpha = 0.87). This index is assumed to have positive consequences on individuals' environmental behaviors (Chen et al., 2013; Hadler and Haller, 2011; Schmitt et al., 2018), since a higher assessment of environmental threats is linked to greater concern about environmental issues and more active reactions. The descriptive statistics showed that people in the public sector feel more worried about environmental risks despite the fact that they share a common living environment with others.

We also computed the Environmental Knowledge variable from ten statements of general knowledge related to the environment, e.g., phosphorus-containing detergents cause water pollution and acid rain has no connection with coal burning. These were given to the respondents with the options true, false, or unknown. We were able to easily rate repliers since each statement had a determinate answer. The results indicated a poor performance by people from the private sector (Cronbach's alpha = 0.82).

Several other sociodemographic characteristics were controlled in our estimation. This included two interval variables, age, and education (Years of Schooling), and some dummy variables including gender, ethnicity, religion, CPC membership, and residency status. The average profile of individuals from the public sector was 4.07 years younger, with 4.84 more years of schooling than individuals from the private sector, as well as being mostly female, of Han ethnicity, religious non-believers, CPC members, and urban residents.

4. Results

The results generated from the ordinary least squares (OLS) regression method are listed in Table 4. The estimations including the sector affiliations and all control variables, were conducted with Models 1 and 2. A special component of the public sector in China was particularly observed by the comparison between the public enterprises (SOEs, observations = 627) and private enterprises (private/foreign enterprises, observations = 1,366) in Models 3 and 4. The means of the VIF (variance inflation factors) were 1.40 (Models 1 and 2) and 1.20 (Models 3 and 4) respectively so that any potential multicollinearity could be precluded in all scenarios.

It can be seen from Table 4 that public sector affiliation was shown to be a positive predictor of environmental behaviors in all models, which supports our hypothesis. Meanwhile, public employees had relatively higher levels of public environmental behaviors than private behaviors. All of the regression coefficients of public sector affiliation were statistically significant, except for the effect of public enterprises on private environmental behaviors.

Perceived Environmental Threat, as an indicator of participants' anxiety levels in relation to environmental degradation, was unsurprisingly associated with environmental behaviors. A related result was that urban residents reported more active behaviors, considering they are exposed to more pollution than rural residents.

Environmental knowledge has a mixed effect on environmental behaviors. On the whole, it was shown to be positively and significantly related to private behaviors and this became non-significant for public behaviors. When testing the enterprise sample, the same results were found for private behaviors, while more environmental knowledge could even lead to negative public behavior. In contrast, the education level, as measured by years of schooling, appeared to generate more positive and significant effects.

The variables of age, gender, ethnicity, and religion, however, presented more disparities. Generally, older people performed private environmental behaviors more willingly than public behaviors. Reversals of coefficients between private and public behaviors were also found for the effects of gender and religion. Another interesting determinant was eth-

Table 3. Descriptive Statistics of Independent Variables

Variables	Public Sectors		Private Sectors	
	Mean	S.D.	Mean	S.D.
Perceived Environmental Threat (0–100)	42.06	21.96	29.14	21.07
Environmental Knowledge (0–10)	6.61	2.41	4.38	2.77
Age	41.16 (min = 18, max = 85)	11.13	45.23 (min = 17, max = 95)	13.55
Years of Schooling (min = 0, max = 19)	13.08	3.20	8.24	4.16
	Frequency	Percent	Frequency	Percent
Gender				
Male = 1	546	37.76	3,054	56.21
Female = 0	900	62.24	2,379	43.79
Ethnicity				
Han = 1	1,361	94.12	4,885	89.91
Others = 0	85	5.88	548	10.09
Religions				
Believers = 1	115	7.95	611	11.25
Non-believers = 0	1,331	92.05	4,822	88.75
CPC Membership				
Yes = 1	409	28.28	283	5.21
No = 0	1,037	71.72	5,150	94.79
Residency Status				
Urban = 1	1,098	75.93	1,296	23.85
Rural = 0	348	24.07	4,137	76.15
Observations	1,446		5,433	

Table 4. Regression Results of Sector Affiliations on Environmental Behaviors

	Overall Sample		Enterprise Sample	
	Model 1	Model 2	Model 3	Model 4
	Private Behavior	Public Behavior	Private Behavior	Public Behavior
Public Sector/Enterprise	1.688*** (2.64)	3.735*** (7.42)	0.668 (0.73)	2.758*** (3.36)
Perceived Environmental Threat	0.103*** (9.08)	0.111*** (12.40)	0.104*** (5.43)	0.130*** (7.50)
Environmental Knowledge	1.478*** (15.60)	0.0141 (0.19)	1.424*** (8.16)	-0.547*** (-3.48)
Age	0.0505** (2.53)	-0.0142 (-0.91)	0.127** (3.05)	-0.0216 (-0.57)
Years of Schooling	0.532*** (7.12)	0.491*** (8.36)	0.926*** (6.06)	0.646*** (4.69)
Gender	-4.892*** (-10.79)	0.982*** (2.75)	-6.021*** (-7.18)	1.165 (1.54)
Ethnicity	-1.125 (-1.44)	-0.182 (-0.30)	0.972 (0.52)	4.265* (2.51)
Religions	-0.992 (-1.36)	1.502*** (2.61)	-5.334*** (-3.82)	2.997* (2.38)
CPC Membership	1.213 (1.54)	2.226*** (3.60)	0.366 (0.27)	1.537 (1.26)
Residency Status	5.747*** (9.90)	0.181 (0.40)	4.785*** (4.96)	1.265 (1.45)
Constant	33.34*** (22.83)	6.642*** (5.78)	27.84*** (8.73)	2.672 (0.93)
Adj R-squared	0.1985	0.1134	0.1753	0.0702
N	6,879	6,879	1,993	1,993

Note: T statistics in parentheses; * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

nicity, whereby individuals of Han ethnicity showed positive environmental behaviors only in the enterprise sample, while the other ethnic minorities were more active.

The effect of CPC membership was surprisingly non-significant in most models (Models 1, 3, and 4),

which is inconsistent with common knowledge that these individuals undergo in-depth study on the issue of ecological civilization for several years. The proportion of CPC membership in the public sector is over five times higher than in the private sector. However, those members' personal pro-environ-

mental behaviors were not remarkably shown, and group cohesion has not sufficiently formed in enterprises.

5. Discussions

With environmental knowledge, environmental sensitivity and general sociodemographic factors controlled, the characteristic variables of the public sector and public enterprises still have positive and mostly significant effects on environmental behaviors. The results of this study confirmed our hypothesis on the potential influences of public-private sector separation in China. The environmental behaviors associated with sector affiliations were well observed. However, some of the contradictory results from the estimation are noteworthy and are further discussed.

First, regarding the environmental literacy framework, the sensitivity-behavior connection was clear, while the knowledge-behavior connection was not fully straightforward. Environmental knowledge did not totally play the role of an internal facilitator of pro-environmental behaviors. Higher environmental knowledge scores were not associated with significant public environmental behaviors and even became obstacles for public environmental behaviors in the enterprise sample. Though public employees performed better when answering the quizzes on environmental knowledge, their higher knowledge level was not reflected in specific green actions. Considering the variable of education has provided a comprehensive enhancement of active environmental behavior, this contradiction may reflect the comparison between general school education and specific environmental education, especially, the professional training programs in public sectors and SOEs. Another captivating result, the non-significant effect of CPC membership in most scenarios, could illustrate a similar suspicion about the outcomes of ideological propaganda and political education regarding environmental issues. The partial failure of the knowledge-behavior connection reminds us of the need for improvement of environmental education on environmental awareness and environmental behaviors (Wang et al., 2013), and also suggests a further issue of balancing among environmental sensitivity, knowledge, and practical behaviors.

Second, private and public environmental behaviors were differently exhibited under various circumstances. More active public behaviors were observed in the public sector and from the CPC members. This might be related to the descriptions of those behaviors in the questionnaire. The public environmental behaviors, e.g., participation in environmental activities, complaints, and appeals, are organized or processed by certain CPC and government agencies which have had significant impacts on their public environmental behaviors. While the CPC members

in the enterprises have less direct interactions with such activities, their green practices are insignificantly influenced. Environmental knowledge, however, showed little effect on public environmental behaviors for the overall sample, and even had a significant negative effect when testing the enterprise sample. The dissimilarity between the two categories of environmental behaviors reflects the knowledge-behavior disconnection again.

Meanwhile, the age, gender, and religion had totally opposite effects on private and public environmental behaviors. The results showed that younger people and religious believers have more extensive participation in public environmental affairs, which is in accordance with mainstream literature (United Nations, 2004; Schusler and Krasny, 2008; Yang and Huang, 2018; Sherkat and Ellison, 2007). Men showed significant negative attitudes towards private environmental behaviors and the results were contrary for their public environmental behaviors. However, evidence from Western countries showed greater participation in environmental movements by females (Tindall et al., 2003; Smith, 2001). Considering most items related to private behaviors in the questionnaire were *inside of the home* activities dominated by women in China (Xiao and Hong, 2010), it is understandable that Chinese women tend to form environmental-friendly behavioral patterns based more on knowledge or experience of material conservation and resource efficiency within families instead of activities in public fields (Jiggins, 1994). Third, some effects are less encouraging when moving from the overall sample to the enterprise sample. The weakening of private environmental behaviors in public enterprises, and the negative effect of environmental knowledge on public environmental behaviors suggests a lag in the environmental responsibility of enterprises, especially the SOEs, in China. This finding is similar to that of Chun (2009), indicating that employees from SOEs have poorer ratings on environmental attitudes compared to those in private companies. The results also imply the profit-driven essence of enterprises, even though SOEs are supposed to pursue social and political targets for governments (Putterman and Dong, 2000). Some firms even tend to work in collusion with local governments that give priority to economic performance over environmental concerns (Mol and Carter, 2006; Maung et al., 2016). Evidence has shown that central SOEs are the primary source of serious pollution incidents due to protectionism and insufficient regulations (Eaton and Kostka, 2017). The impact of the poor environmental performances of these enterprises on the lower level of environmental behaviors by their employees cannot be ignored. Meanwhile, we assume that some of the results regarding environmental knowledge may also be associated with the personal characteristics of employees in enterprises – approximately 70 percent were from private enterprises, with lower level of education, and this

included more older people, men, ethnic minority groups, and religious believers. Thus, the sociodemographic structure of the enterprise sample may have also caused the divergence between the enterprise group and the other groups.

6. Conclusions

China's rapid economic growth and serious environmental risk both originated from the market-oriented reforms that occurred four decades ago. The public-private sector separation, a derivative of the reforming process, is tightly connected to environmental issues, especially people's environmental behaviors. Investigations on the interrelationships between sector affiliation and environmental behaviors, however, are notably lacking. This article intended to fill the lacuna with an empirical research study that examined whether public employees and private employees would present disparities in their environmental behaviors. The results showed that public sector and state-owned enterprise affiliations were both positive predictors of environmental behaviors. However, private environmental behaviors were weak in SOEs and environmental knowledge had an insufficient impact on public environmental practices. This evidence indicates the potential for improvement of green ideology education within the official system and reveals the ignorance of green actions especially by SOE employees.

The findings highlight the role of the public sector in shaping employees' behaviors toward the environment. Despite the downsizing of the workforce in the marketization, the public sector still has a great influence on ecological civilization in China. To improve environmental behaviors, environmental education inside and outside the public sector needs to be further enhanced. The complementary combination of ideology education, professional training, and practical activities could facilitate the environmental knowledge-behavior connection in China's public sector. As for the SOEs, a performance evaluation system with more weight on environmental issues could encourage ecological entrepreneurs and foster positive environmental behaviors. Another essential policy is reforming environmental education in the school curriculum to remedy the absence of environmental enlightenment in most parts of the private sector and to stimulate spontaneous environmental behaviors by the general public. Only when the public and private sectors become jointly involved can pro-environmental behaviors be effectively practiced, and an ecological civilization be ultimately achieved in China.

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