Peer-reviewed version available at Religions 2020, 11; doi:10.3390/rel11040165

Religious Beliefs and Public Pro-Environmental Behavior in China: the Mediating Role of Environmental Risk Perception

Sheng Zeng[1], Lin Wu[1*] and Tianyuan Liu[1*]

1 School of Sociology, Wuhan University, 299 Bayi Road, Wuhan 430072, China; zengs372@whu.edu.cn

* Correspondence: wlin@whu.edu.cn

ltyuan@whu.edu.cn

Abstract: Although the positive relationship between religion and environmental behavior is well-argued, empirical research about the relationship between religion and public pro-environmental behavior is relatively lacking. This paper aims to explore the group differences in the influence of religion on public pro-environmental behavior and the mediating role of environmental risk perception in religion and public pro-environmental behavior. Using the Chinese General Social Survey data in 2013 for empirical analysis, this study's results show that there are group differences in the impact of religion on public pro-environmental behavior. Women with religious beliefs are more willing to engage in public pro-environmental behavior than those without religious beliefs. Religious believers over the age of 45 are more willing to participate in public pro-environmental behavior than those without religious beliefs. Political participants with religious beliefs are more willing to practice public pro-environmental behavior than those without religious beliefs. In addition, we found that environmental risk perception can act as partial mediation in religious and public pro-environmental behavior. In other words, religious beliefs are deeply embedded in local political and social culture. In order to correctly understand the relationship between religion and public pro-environmental behavior, it is necessary to consider religion in a specific cultural background.

Key words: Religious beliefs; Public pro-environmental behavior; Environmental risk perception; China

1. Introduction

Over the past 40 years of reform and opening up, China has faced an unprecedented environmental crisis. Rapid population expansion and economic growth have caused the largest "environmental disaster" in history. The unilateral emphasis on the economic development has increased the level of "turbidity" in modern social spaces to a degree without parallel in history. Air pollution, water pollution, marine pollution, solid waste pollution, and toxic pollution have spread endlessly throughout society. Water resource shortage, land desertification, acid rain, agriculture land depletion, and animal extinction have swept the social space mercilessly (Harris, 2006). In recent days, paddlefish has broken the news. The government has implemented a ten-year fishing ban in the Yangtze River beginning January 1, 2020. The severity of environmental problems and the urgency of environmental protection is clearly evident in China. The highlights of environmental problems have once again attracted attention from political and academic circles. Since the 18th National Congress of the Communist Party of China, President Xi Jinping repeatedly stressed on several occasions that "we must strengthen the construction of ecological civilization and put forward the most powerful voice of the age" that says "lucid waters and lush mountains are invaluable assets" (Xi Jinping,2013). Since 2019, many cities in China have begun to introduce waste classification policies. At

present, environmental governance has become an important part of social governance. Some scholars have suggested that individual knowledge, belief, and attitude have an important impact on the ecological environment (Maloney, Ward, & Braucht, 1975). Human environmental paradigm (HEP) holds that human beings are not bound by natural laws, environmental resources are inexhaustible, and the natural environment is a means and tool for human beings to achieve their own goals (Catton & Dunlap, 1978). This causes large-scale destruction of natural environment by human beings. A new environmental paradigm (NEP) holds that human activities are closely related to the natural environment (Dunlap & Liere, 2008; Dunlap, Liere, Mertig, & Jones, 2000). The spread of this concept coincided with the emergence of many environmentalists. A study shows that gender, age, working status, education, residence, etc. have an important impact on environmental behavior and that women, young, employed, highly-educated, urban, and single people are more willing to participate in environmental behavior (Chen et al., 2011). Some scholars divide environmental behavior into public pro-environmental behavior and private pro-environmental behavior, and they suggest that public pro-environmental behavior has no significant difference in different countries but that private pro-environmental behavior is heavily influenced by local conditions, in which politics and resources are two important factors (Hadler & Haller, 2011).

Since the 1960s, the relationship between religion and environment has attracted wide attention in academic circles (Berry, 2013). Historian Lynn White (1967) pointed out that Jewish Christianity's moral concept of nature caused an ecological crisis. There are different opinions in academic circles in response to this judgement. Some scholars suggest that Lynn White's opinion is well-founded. It is clearly written in *Genesis*: "...Then God said: 'Let us make man in our image, in our likeness, and let them rule over the fish of the sea and the birds of the air, over the livestock, over all earth, and over all creatures that move along the ground'" (Genesis 1.26). To realize glory of God, humans must learn to control nature (Hayes & Marangudakis, 2019). Eckberg & Blocker (1989) also further confirmed the destructive role of Christianity on environment. Some scholars hold a critical view on Lynn White's opinion that although Christianity has a negative effect on environment, many liberals and moderates still take a positive attitude towards environment protection. For example, the Southern Baptist Convention has begun to advocate members to be a good steward of nature (Sherkat & Ellison, 2019). Since the mid-1990s, many observers claimed there has been "Christianity greening" in the United States. Some environmentalists (Haluza-Delay, 2000; Hoffman & Sandelands, 2005), religious scholars (Kearns, 1996; Wallace, 2008), and religious leaders (Beisner, 2001; Harper & Kennealy, 2009) believe that empathy for the environment is essentially consistent with Christian values, even if it is not required by Christian values. Using the 2010 General Social Survey data (GSS), researchers found that the environmental concerns of those who self-identify as Christians about pro-environmental behavior are lower than those of non-Christians. Self-identitification with Christianity has a positive effect on pro-environmental behavior, but not on pro-environmental attitude and belief (Clements, McCright, & Xiao, 2014). It is noted that religion and environment do not have a simple linear relationship. Some scholars have pointed that there is a complex relationship between religion and politics. For example,

the connection between fundamentalism and politics makes the interpretation of the effect of religion on environment beliefs more complicated, because political conservatism is negatively correlated with environmentalism (Sherkat & Ellison, 2007; Woodrum & Wolkomir, 1997). Pickering & Jewell (2008) also found the close connection among belief, politics, and environment in the study of the indigenous Kolata community. With the help of these three elements, the indigenous Kolata community has realized the connection of spiritual value. Some scholars divide environmentalism into problematic environmentalism and moral environmentalism. Most of the religious groups think their pro-environmental behavior is a kind of moral environmentalism, which is based on the connection between God and nature and emphasizes action, community, and justice (Smith & Pulver, 2009).

According to incomplete statistics, religious believers account for 59% of the global population (WIN-Gallup International 2012), and Christianity accounts for 3/4 of the total population of North America and Europe (Pew Research Center 2012). It can be seen that religious beliefs are held by the vast majority of the global population and have deeply influenced the trend of global environmental governance. China, by contrast, has the smallest share of religious believers, who only account for 14% of the total population in China (WIN-Gallup International 2012). The results of the China Family Panel Studies show an even lower percentage. Religious believers only account for 10% of the total population in China (CFPS 2012). However, China is a super-state with a population of 1.4 billion. The scale of religious believers in China cannot be underestimated. From the perspective of current research, studies of religious beliefs on environmental behavior mainly proliferate in western academic circles, especially those exploring the impact of Christianity on environmental behavior. Although a few scholars began to explore the internal relationship between religious and environmental behavior, on the whole, the study of religion and environmental behavior is still lacking in Chinese discourse. Exploring the relationship between religion and environmental behavior based in China and rooted in Chinese culture is not a simple replication of relevant research in the western world. It is an effective supplement that diversifies academic research. China is an atheist country. The Communist Party of China, as the ruling party, is a firm supporter of materialism. In national political and ideology education, it firmly instills socialist values and materialistic ideals into the public. This special political background provides a special growing environment for China's religion, and the political and cultural differences between China and the West make it necessary to study the relationship between China's religion and environmental behavior.

At present, the research concerning religion and environmental behavior in China mainly focuses on three aspects, the first of which is the mechanism of religion and environment. For example, some scholars have studied how religious beliefs in rural communities in Tibetan areas affect environmental behavior. The researchers pointed out that religion could restrain villages' environmental destruction through deifying the landscape, instilling the concept into villages that killing the animals and plants is evil, and using the moral norms embodied in Buddhist doctrine (Woodhouse, Mills, McGowan, & Milner-Gulland, 2015). Using listed companies in polluting industries in 2008-2010 as samples, researchers found that social rules embodied in

Buddhism can awaken the awareness of social responsibility and enhance corporate social responsibility (CSR) (Du, Jian, Zeng, & Du, 2014). The second focus has been the internal relationship between China's religion and environment. Xing & Starik (2017) have studied the relationship between Taoism and nature and suggest that Taoism regards humans and nature as a harmonious and unified whole. The attitude of Taoism leaders towards nature is not to control nature, but live in harmony with nature. The Confucian concept of "*tianren heyi*" closely combines nature and humans and provides theoretical and practical guidance for our understanding of the human position in the universe, the harmony between humans and nature, and the value of environmental protection and conservation (YAO, 2014). Third, researchers have tried to use empirical data on China to test the influence of religion on environmental behavior. Some scholars found that religious beliefs have a significant positive effect on public pro-environmental behavior but no significant positive effect on private pro-environmental behavior after dividing comprehensive environmental behavior into private pro-environmental behavior and public pro-environmental behavior (Yang & Huang, 2018).

It has been preliminarily confirmed that Chinese religions contain knowledge, values, and belief systems that are conductive to pro-environmental behavior. It is shown that religion is an important factor that cannot be ignored in the practice of pro-environmental behavior. However, it is noted that research on the impact of religious beliefs on environmental behavior is still relatively rough and needs to be further enriched and expanded by future scholars. We suggest that environmental behavior needs to be refined. There are differences in the role and influencing mechanisms on different environmental behavior, which must be discussed separately. In this article, we mainly focus on public pro-environmental behavior and try to use empirical data in China to study the group differences in the influence of religious beliefs on public pro-environmental behavior and the influencing mechanism of religious beliefs on public pro-environmental behavior.

2. Risk Perception and Environmental Behavior

Risk perception is a psychological concept proposed by Slovic and aims to explain how social risk is perceived by the public (Slimak & Dietz, 2006; Slovic, 1999). With the increase of social risk, the study of risk perception of the public has become a hot issue in academia (Bubeck, Botzen, & Aerts, 2012; Sjöberg, 2000; Slimak & Dietz, 2006; Slovic & Peters, 2006). In addition to exploring the impact factors of risk perception (Sjöberg, 2000), some scholars have also pointed out that there is a certain relationship between risk perception and behavior. According to the theory of protection motivation, Bubeck et al.(2012) suggested that individuals' high-risk perception needs to be accompanied by coping appraisal in order to result in a protective response. The result shows that high perception of flood risk is an important measure in promoting individual flood control behavior. O'Connor et al.(1999) also showed that risk perception plays an important role in predicting behavioral intention in a study on risk perception and willingness to cope with climate change. (Lindell & Hwang, 2008) also emphasized the importance of risk perception in behavioral decision-making when discussing the family's perception and response to personal risk under multiple disaster

conditions. There is no denying that risk perception plays an important role in personal action and behavioral decision-making. It is noted that risk perception also includes the perception of environment risk (ERP). In this paper, based on existing research findings and understanding, it is assumed that risk perception has a significant positive effect on public pro-environmental behavior and acts as a mediating role between religious beliefs and public pro-environmental behavior. Religious believers indirectly affect public pro-environmental behavior through the perception of environmental risk.

3. Data and Measures

3.1. Data

The data we used in this article is from the 2013 version of the Chinese General Social Survey(CGSS 2013), which has been a member (on behalf of the mainland) of the International Social Survey Program (ISSP) since 2007 (Yang & Huang, 2018). The Chinese General Social Survey conducted by the National Survey Research Center at Renmin University of China (NSRC) started in 2003 and is the earliest national, comprehensive, and continuous academic survey project in China. Since 2003, the NSRC has conducted a continuous cross-sectional survey on more than 10,000 households in various provinces, municipalities and autonomous regions in China, which comprehensively collected data from multiple levels, including society, community, family, and individual. In order to ensure the validity, authenticity, representativeness, and accuracy of the data, the CGSS 2013 adopted objective sampling, including phased sampling, stratified sampling, and cluster sampling. It also equipped professional investigator and supervised inspections, etc. to ensure the quality of the data. The CGSS 2013 covered 487 communities in 28 provinces, autonomous regions and municipalities excluding Taiwan, Hong Kong and Macau. The respondents were mainly adults over 16 years old. The project collected individuals' demographic characteristics such as gender, age, ethnicity, religion, education, income, political status, housing status, and marital status, etc. and some other information related to the study including environmental knowledge, environmental risk perception, and environmental behavior. This study collected a total of 11,438 samples and yielded final sample of 9,144 after deleting invalid samples such as "refused to answer", "unanswerable", and "singular value".

3.2. Independent variable

We chose "religion" in the CGSS 2013 as the independent variable of study. The items included "Don't believe in religion", "Buddhism", "Taoism", "Folk belief (Matsu worship, Guangong, etc.)", "Islam", "Catholicism", "Christianity", "Orthodox", "Other Christianity", "Judaism", "Hinduism", and "other". Respondents chose one or more items. We assigned respondents that "do not believe in religion" a value of 0 and assigned respondents that "believe in Buddhism, Taoism, Folk belief (Matsu worship, Guangong, etc.), Islam, Catholicism, Christianity, Orthodox, Other Christianity, Judaism or Hinduism" a value of 1. At the same time, we deleted the items in which respondents answered "Other". Finally, we obtained new variable of "religion beliefs" according to the above methods.

3.3. Mediating variable

We selected the question, "How serious are the following types of environmental problems in your area?", which contains 12 environmental problems that reflect mediating variable of study. The environmental question items that respondents needed to answer include "Air pollution", "Water pollution", "Noise pollution", "Industrial waste pollution", "Domestic waste pollution", "Insufficient green space", "forest vegetation destruction", "Cropland quality degradation", "Fresh water shortage", "Food pollution", "Desertification", and "Wildlife deduction". Respondents could rate extent of the answer as "Very serious", "Relatively serious", "Less serious", "Not serious", "Fair", "Don't care/Unclear", or "No such problem". To ensure the consistency of the research, we assigned a value of 1, 2, 3, 4 ,5, 6 and 7 to the respondents who answered "No such problem", "Don't care/Unclear", "Fair", "Not serious", "Less serious", "Relatively serious", and "Very serious" respectively. To ensure the objectivity and integrity of the data, we handled missing values by Sequential Mean Interpolation. Finally, we used the total score of the 12 environmental problems after being processed as a measure of environmental risk perception (ERP). The higher the above score, the higher the degree of ERP.

3.4 Dependent variable

We selected the question, "We want to know, in the past year, have you engaged in the following activities or behaviors?", which obtained 10 environmental behaviors. First, we performed a factor analysis on these 10 items, and then we extracted two factors including private pro-environmental behavior (Private PEB) and public pro-environmental behavior (Public PEB). In this study, we also found that religious beliefs do not have a significant positive effect on environmental behavior in the private domain (β=0.037, p>0.05). Thus, we mainly focused on the complex relationship between religious beliefs and environmental behavior in the public domain. Public Pro-environmental Behavior mainly contains the following 5 items, including "(5) Donate for environmental protection", "(7) Actively participate in environmental education organized by governments and work units", "(8) Actively participate in environmental protection activities organized by private environmental protection groups", "(9) Conserve forests and green spaces at their own expense", and "(10) Actively participate in complaints and appeals that require environmental issues to be resolved". We assigned a value of 1, 2, and 3 to the respondents who answered "Never", "Occasionally", and "Often", respectively. Finally, we used the aggregated scores of the 5 items as the indicators of Public Pro-environmental Behavior. The higher the score of Public Pro-environmental Behavior, the more willing respondents are to conduct public pro-environmental behavior.

3.5 Control variable

Based on the availability of data and drawing on existing research, we controlled variables that could affect public pro-environmental behavior, including gender, age, ethnicity, education, hukou, income, political status, housing status, working status, marital status, health, and environmental knowledge (EK). To facilitate statistics and analysis, in terms of gender, we assigned "Female" a value of 0 and "Male" a value of 1. In terms of age, we assigned a value of 0, 1, and 2 to "Under 44", "45-59", and "Over 60", respectively. In terms of ethnicity, we assigned "Minority" a value of 0 and "Han" a value of 1. For education, we assigned

a value of 0, 1, 2, and 3 to "Primary and below", "Junior high school", "Senior high school", and "College and above", respectively. For income, we took the total annual income as a logarithmic measure. For political status, we assigned "Non-Chinese Communist Party Members" a value of 0 and "Chinese Communist Party Members" a value of 1. In terms of housing status, we assigned a value of 0 ,1, and 2 to "Residence belongs to myself or my spouse", "Residence belongs to parents or child", and "Residence belongs to others", respectively. For working status, we assigned "No Working" a value of 0 and "Working" a value of 1. In terms of marital status, we assigned "Unmarried" a value of 0 and "First marriage with spouse", "Remarriage with spouse", "separation without divorce", "divorce", and "widowed" a value of 1. For health, we assigned a value of 1, 2, 3, 4, and 5 to "Very unhealthy", "Less healthy", "Generally healthy", "Healthier", and "Very healthy", respectively.

At last, we selected the question "Finally, we want to know your mastery of environmental protection knowledge", which contains 10 items as indicators of environmental knowledge. The items that respondents needed to answer include "Car exhaust does not pose a threat to human health", "Excessive use of fertilizers and pesticides causes environmental damage", "Using phosphorous laundry powder does not cause water pollution", "Fluorine emissions from fluorine-containing refrigerators does not deplete the ozone layer of the atmosphere", "There is not relationship between the generation of acid rain and coal burning", "Species are interdependent, and the disappearance of a species will have a chain reaction", "In the air quality report, third-class quality means better than first-class air quality", "Single species of trees are more likely to cause diseases and insect pests", "In the water pollution report, V(5) water quality means better than I(1) water quality", and "The increase of carbon dioxide in the atmosphere is a factor of causing climate warming". We assign "Correct" a value of 1 and "Wrong" or "Do not know" a value of 0. Finally, we used the aggregated scores of the 10 items as the indicator of environmental knowledge (EK). The higher the score, the higher the degree of mastery of environmental knowledge.

4 Results

4.1 Descriptive analysis of social demographic characteristics

As shown in Table 1, there are 976 religious beliefs in 9,144 valid samples, accounting for about 10.67% of the total sample, This is roughly consistent with the statistical results (10%) of China Family Panel Studies (CFPS 2012). Most of the believers mainly believe in Buddhism, accounting for 4.8% of the total believers. The second is Islam, accounting for about 2.3% of the total believers. In contrast, the number of people who believe in Folk religion, Christianity, Catholicism, and Taoism is relatively small, accounting for 1.8%, 1.7%, 0.3%, and 0.2% of the total believers, respectively. Through further analysis, we found that the proportion of male and female in religious groups is relatively equal and that the age distribution is relatively even, but there are ethnic differences, among which the Hans account for 8.3% of the total religious groups and minorities only account for 2.4% of the total religious beliefs. In terms of regional differences, the religious belief ratio of the rural population (5.8%) is slightly higher than that of the urban population (4.9%). At the same time, there are also clear differences among religious believers in education. As a whole, the proportion

Preprints (www.preprints.org) | NOT PEER-REVIEWED | Posted: 24 January 2020 doi:10.20944/preprints202001.0284.v1

Peer-reviewed version available at Religions 2020, 11; doi:10.3390/rel11040165

of believers with a junior high school education or below is significantly higher than that of those with a senior high school or above. We also found that the proportion of religious believers who own house property rights (6.8%) is significantly higher than those who do not own house property rights (3.8%). From the perspective of health status, the overall trend is that the proportion of religious believers with good health is larger than that of those who do not have a good health. Table 1 does not list all social demographic variables and mainly focuses on several variables directly related to this study.

Table 1. The result of descriptive analysis (Mean/Percentage)

Variables	Non-believers	Religious Believers	Buddhism	Taoism	Folk	Islam	Catholicism	Christianity
Gender								
Female=0	42.6%	6.3%	3.0%	0.1%	0.9%	1.2%	0.2%	1.2%
Male=1	46.8%	4.4%	1.8%	0.1%	0.9%	1.1%	0.1%	0.5%
Age								
Age(6~44)=0	25.3%	2.6%	1.1%	0.1%	0.4%	0.8%	0.1%	0.4%
Age(44~59)=1	28.6%	3.1%	1.3%	0.1%	0.7%	0.6%	0.2%	0.5%
Age(60~)=2	35.5%	4.9%	2.4%	0.1%	0.6%	0.9%	0.1%	1.0%
Ethnicity								
Minority=0	2.6%	2.4%	0.2%	0.0%	0.0%	2.2%	0.0%	0.0%
Han=1	86.7%	8.3%	4.6%	0.2%	1.7%	0.1%	0.3%	1.7%
Hukou								
Rural	48.4%	5.8%	2.5%	0.2%	0.7%	1.2%	0.1%	1.2%
Urban	40.9%	4.9%	2.3%	0.0%	1.0%	1.0%	0.2%	0.5%
Education								
Primary=0	30.3%	5%	2%	0.1%	0.7%	1.3%	0.1%	1.0%
Junior=1	26.8%	2.9%	1.4%	0.1%	0.4%	0.5%	0.1%	0.5%
Senior=2	17.4%	1.6%	0.8%	0.1%	0.3%	0.2%	0.1%	0.2%
College=3	14.9%	1.2%	0.6%	0.0%	0.3%	0.2%	0.0%	0.1%
Residence								
Owned=1	55.8%	6.8%	3.0%	0.2%	1.2%	1.5%	0.2%	1.2%
Borrowed=2	20.6%	2.5%	1.2%	0.0%	0.4%	0.5%	0.1%	0.4%
Rented=3	12.9%	1.3%	0.6%	0.0%	0.1%	0.3%	0.1%	0.2%
Health								
Very Unhealthy=1	2.4%	0.4%	0.1%	0.0%	0.1%	0.0%	0.0%	0.1%
Less Healthy=2	11.6%	1.8%	0.8%	0.1%	0.3%	0.4%	0.0%	0.4%

Preprints (www.preprints.org) | NOT PEER-REVIEWED | Posted: 24 January 2020 doi:10.20944/preprints202001.0284.v1

Peer-reviewed version available at Religions 2020, 11; doi:10.3390/rel11040165

Generally Healthy=3	16.8%	2.1%	1.2%	0.1%	0.4%	0.2%	0.1%	0.3%
Healthier=4	34.6%	4.3%	1.7%	0.1%	0.7%	1.2%	0.1%	0.7%
Very Healthy=5	23.9%	2.1%	1.0%	0.0%	0.3%	0.5%	0.1%	0.3%

4.2 Group differences of religious beliefs on public pro-environmental behavior

The study showed that religious belief has a significant positive effect on public pro-environmental behavior (β=0.14, p<0.01). On this basis, we continued to explore the group differences of religious beliefs on public pro-environmental behavior (as shown in Table 2). We used Ordered Probit Regression to test the relationship between religious beliefs on public pro-environmental behavior in different groups. First of all, we discussed the difference of the influence of religious belief on public pro-environmental behavior across gender and age (Model 1-Model 5). The results showed that women with religious beliefs are more willing to practice public pro-environmental behavior than those without religious beliefs (β=0.17, p<0.01). In contrast, there is no significant difference between men's levels public pro-environmental behavior (β=0.11, p>0.05), whether they believed in a religion or not. The results suggest that religious beliefs to a certain extent improves women's attention and action on public pro-environmental behavior. But men are more involved in public affairs. Thus, the role of religion is not obvious to them. In terms of age, youth was not correlated with willingness to practice public pro-environmental behavior. We found that those middle-aged or older (over 45 years old) were more willing to practice public pro-environmental behavior. With the increase of age, people are more willing to practice public pro-environmental behavior (45-59 years old: β = 0.18, P < 0.05; over 60 years old: β = 0.26, P < 0.01). This may be closely related to the crisis of middle age, which promotes the individual's exploration of social value, life meaning, religious concepts. This makes the middle-aged and elderly pay more attention to public environmental protection. Secondly, we explored the difference of influence of religious beliefs on public pro-environmental behavior in hukou and household (Model 6- Model 10). We found that religious believers are more willing to practice public pro-environmental behavior in both rural and urban settings (rural: β = 0.13, P < 0.05; urban: β = 0.14, P < 0.05). The results indicate the important role of religious belief in rural regions. Under the guidance of religious belief, religious believers who live in rural region are liberated from family labor and pay attention to public environmental protection and take action. From the perspective of housing status, the results suggest that the religious believers whose household property rights are their own or of their spouse are more willing to practice public pro-environmental behavior than those without religious beliefs. It shows that household occupies an important position in the view of Chinese people. Individuals whose household property rights are their own or of their spouse are more willing to exhibit altruistic behaviors including environmental protection. Under the influence of pro-environmental concepts contained in religious beliefs, religious believers whose household property rights is their own or of their spouse show more initiative in public pro-environmental

behavior. Finally, we discuss the difference of religious beliefs on public pro-environmental behavior in political status (Model 11- Model 12). The results show that political participants with religious beliefs are more willing to practice public pro-environmental behavior than those without religious beliefs (β=0.23, p<0.01). For those who do not participate in politics, there is no significant difference in whether they believe in religion or not. To some extent, religion is closely related to politics, both of which emphasize the concern for public affairs. With the influence of religious beliefs, political participants pay more attention towards turning environmental concerns into actions.

4.3 The mediating effect of environmental risk perception

This part uses the nonparametric percentile bootstrap method of deviation correction recommended by WEN Zhonglin & Baojuan (2014) to test the mediating effect of environmental risk perception. In this study, 5000 samples were taken repeatedly. In the specific inspection and methods, the study used the SPSS macro PROCSS plug-in developed by Hayes. We chose Model 4 to test the mediating effect of environmental risk perception between religious beliefs and public pro-environmental behavior on the basis of controlling individual social demographic and personal characteristics such as gender, age, ethnicity, education, income, hukou, political status, housing status, working status, marital status, health, and environmental knowledge.

As shown in Table 3, the results of mediating effect model show that religious beliefs have a significant positive effect on public pro-environmental behavior (β=0.18, p<0.01,C1=[0.06,0.29]). Religious beliefs have a significant positive effect on environmental risk perception (β=1.03, p<0.01,C1=[0.29,1.76]), and environmental risk perception also has a statistically significant positive effect on public pro-environmental behavior (β=0.01, p<0.01,C1=[0.01,0.01]). This suggests that environmental risk perception plays a part of a mediating role between religious beliefs and public pro-environmental behavior. We used Bootstrap to estimate the interval of mediating effect. The results (Table 4) indicate that the value of mediating effect of environmental risk perception is 0.01 (95%CI=[0.00,0.02]), and the confidence interval does not contain 0. It can be considered that the mediating effect of environmental risk perception is credible, which accounts for 6% of the total effect. This indicates that the influence of religious beliefs on public pro-environmental behavior is partly due to the role of environmental risk perception. People with religious beliefs have a higher environmental risk perception. Accordingly, the higher the perception of environmental risk, the higher the frequency of practicing public pro-environmental behavior.

Table 2. Ordered Probit Regression of Religious on Public Pro-environmental Behavior in Different Groups

Variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10	Model 11	Model 12
	Female	Male	Age (6~44)	Age (45~59)	Age (60~)	Rural	Urban	Owned house	Borrowed house	Rented house	Non-voted	Voted
Religious	0.168***	0.106	-0.143	0.179**	0.263***	0.133**	0.144**	0.214***	0.085	-0.133	0.052	0.231***
	(2.71)	(1.59)	(-1.57)	(2.23)	(3.80)	(2.01)	(2.29)	(3.84)	(0.87)	(-1.00)	(0.83)	(3.54)
Ethnicity	0.168*	0.325***	0.078	0.456***	0.265**	0.164*	0.369***	0.365***	0.258*	-0.070	0.201**	0.297***
	(1.71)	(3.61)	(0.69)	(3.67)	(2.34)	(1.83)	(3.78)	(4.21)	(1.75)	(-0.47)	(2.29)	(2.90)
Education	0.210***	0.189***	0.238***	0.280***	0.118***	0.174***	0.201***	0.195***	0.185***	0.247***	0.206***	0.200***
	(7.58)	(8.12)	(6.89)	(8.69)	(4.17)	(6.05)	(8.57)	(8.80)	(4.59)	(5.45)	(8.50)	(7.59)
CPC	0.176**	0.193***	0.142*	0.191**	0.199***	0.521***	0.068	0.129***	0.347***	0.229*	0.106*	0.204***
	(2.29)	(3.89)	(1.74)	(2.49)	(3.19)	(6.45)	(1.41)	(2.59)	(3.69)	(1.88)	(1.76)	(3.54)
Married	-0.114	-0.041	-0.112*	0.257	-0.215	-0.092	-0.045	0.093	-0.239***	0.010	-0.101	-0.087
	(-1.29)	(-0.63)	(-1.84)	(1.28)	(-1.09)	(-1.14)	(-0.65)	(0.77)	(-2.87)	(0.10)	(-1.63)	(-0.85)
Work	0.015	-0.031	0.072	-0.089	-0.044	-0.062	0.028	-0.055	0.079	0.016	-0.027	0.005
	(0.28)	(-0.67)	(1.00)	(-1.46)	(-0.72)	(-1.23)	(0.55)	(-1.28)	(0.99)	(0.16)	(-0.55)	(0.10)
Income	0.064***	0.041*	-0.019	0.074**	0.091***	0.008	0.140***	0.052***	0.056*	0.065	0.083***	0.028
	(2.69)	(1.96)	(-0.60)	(2.53)	(3.52)	(0.37)	(5.46)	(2.61)	(1.71)	(1.42)	(3.81)	(1.25)
Health	0.037*	0.028	-0.030	-0.030	0.096***	0.024	0.040*	0.023	0.080**	0.005	0.024	0.040*
	(1.72)	(1.46)	(-0.97)	(-1.21)	(4.45)	(1.22)	(1.94)	(1.32)	(2.52)	(0.12)	(1.20)	(1.95)

EK	0.087***	0.065***	0.025	0.075***	0.107***	0.104***	0.046***	0.073***	0.095***	0.049**	0.065***	0.087***
	(7.35)	(6.12)	(1.62)	(5.50)	(8.56)	(9.35)	(4.10)	(7.60)	(5.40)	(2.30)	(5.89)	(7.72)
N	3689.000	4437.000	2169.000	2650.000	3307.000	4262.000	3864.000	5232.000	1737.000	1157.000	4362.000	3764.000
Pseudo R^2	0.064	0.043	0.040	0.055	0.055	0.039	0.035	0.052	0.071	0.041	0.057	0.053
LR chi[2]	574.58	508.06	258.97	376.90	402.06	337.56	410.81	697.45	317.21	118.45	628.00	521.61

[1] t statistics in parentheses * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$(two-tailed tests)

[2]For simplicity, cut points of Ordered Probit regressions are not presented.

Table 3. Regression analysis of variables in the model

Regression Equation		**Overall Fit Index**			***Sig.* of regression coefficient**				
Dependent Variables	Independent Variables	R	R^2	F	Coeff	t	p	LLCI	ULCI
PEB	Religious	0.33	0.11	75.17	0.18	2.99	0.00	0.06	0.29
ERP	Religious	0.20	0.04	24.37	1.03	2.75	0.00	0.29	1.76
PEB	ERP	0.33	0.11	70.70	0.01	5.19	0.00	0.01	0.01

Table 4. Mediation Model of Environmental Risk Perception

Mediate Effect	**Effect**	**SE**	**t**	**p**	**LLCI**	**ULCI**
Total Effect	0.18	0.06	2.99	0.003	0.06	0.29
Direct Effect	0.17	0.06	2.83	0.005	0.05	0.28
Indirect Effect	0.01	0.00			0.00	0.02

5. Discussion and Conclusion

Compared with western research on the relationship between religious belief and environment, the research on that relationship in China is still relatively lacking. Since the 1960s, western scholars have begun to explore the complex relationship between religion and environment (Lynn White, 1967). In the past 50 years, a large number of studies have emerged, which make up for the gap of the study of the relationship between religion and environment. In China, the discussion about the relationship between religion and environment just started to appear in the past 20 years. Some people may wonder why don't we use western research paradigms directly to interpret the internal relationship between religion and environment in China. It must be noted that China's special national conditions determine that we cannot copy the western research studies directly. China is an atheist country. The Communist Party of China is the ruling party and a firm supporter of Marxism. Social individuals are firmly instilled with socialist values and materialistic beliefs. With the cultivation of China's political system and traditional culture, relatively few people believe in religion. This does not mean that China's religion is not important. China implements the policy of freedom of religious belief, which provides a unique developmental environment for religion and also provides a unique perspective for studying religion. Under the circumstance of increasingly severe environmental degradation, we should try our best to excavate the significance of religion for environment protection. The correct way is to absorb the previous research and reexamine the relationship between religion and environmental behavior in the Chinese context. After carefully reviewing current studies concerning China's religion and environmental behavior, we found that some scholars have focused on the natural relationship between religious beliefs and environmental behavior (Woodhouse, Mills, McGowan, & Milner-Gulland, 2015； Du, Jian, Zeng, & Du, 2014； Yang & Huang, 2018). However, whether there are differences in nature and group in the influence of religion on environmental behavior remains to be further discussed. We have confirmed in our research that religious beliefs have no significant positive effect on private pro-environmental behavior. Thus, in this article, we will further deepen the research on religion and environment and mainly focus on exploring the relationship between religion and public pro-environmental behavior, especially exploring the group differences in the influence of religion on public pro-environmental behavior and influencing mechanism of religion on public pro-environmental behavior.

Based on the data of the Chinese General Social Survey in 2013, this paper took religious beliefs as the independent variable and public pro-environmental behavior as the dependent variable. After controlling for some social demographic characteristics, we mainly discussed the differences in gender, age, hukou, household, and political status in the impact on religion and public pro-environmental behavior. On this basis, we reveal the role of environmental risk perception on religious beliefs and public pro-environmental behavior.

First, we found that women who hold religious beliefs participate in more public pro-environmental behavior than those without religious beliefs, while men who believe in religious beliefs and men who don't believe in religious beliefs have no significant difference in participating in public pro-environmental

behavior. Previous studies have shown that due to the influence of traditional notion that " men's work centers around outside, women's work centers around inside", women are more likely to deal with environmental issues related to family affairs compared to men, while public pro-environmental behaviors are less involved (Xiao & Hong, 2010). This study further confirmed that not all women are indifferent to public pro-environmental behavior. Women who hold religious beliefs are more concerned about public pro-environmental behavior. Religious groups organize religious believers in the form of religious activities. Through these activities, religious beliefs are endowed with shared values and consistent goals and actions. Driven by these beliefs, women's attention shift from family activities to public pro-environmental behavior. In contrast, men themselves are the main participants in social public affairs, which makes them more willing to support public environmental protection. In a sense, religion's stimulating effect on men's public pro-environmental behavior is not as obvious as that on women's public pro-environmental behavior.

Second, we found that there are age differences in the influence of religious beliefs on public pro-environmental behavior. There is no significant influence on public pro-environmental behavior of religious believers under 45. In contrast, there is a significant impact on public pro-environmental behavior on religious believers over the age of 45. This conclusion is contrary to Chen et al.'s (2011). They thought the younger one is, the more willing one is to participating in public pro-environmental behavior. We think it may be related to related to China's national conditions. In China, individuals under the age of 45 are mainly in the period of life of career development. In this period, individuals face much pressure in work and life, which could suppress the stimulation of religion on individuals. When one is over 45, individuals' career and family are generally more stable. The main aim in this period is to pursue higher status and prestige. Obviously, participating in public pro-environmental behavior is a great way to achieve this goal. In addition, most of these individuals have the time and ability to engage in public pro-environmental behavior. Inspired by the religious beliefs, individuals in this period are more willing to engage in public pro-environmental behavior because their behaviors are supervised by religion. Especially when individuals are over the age of 60, they hope to realize their own life meaning and social value, and religion affirms that participating public pro-environmental behavior is an important way to achieve life meaning and social value. Thus, religious middle-aged and religious old people are more willing to participate in public pro-environmental behavior.

Third, we found that whether rural or urban, religious believers are more willing to engage in public pro-environmental behavior. Chen et al. (2011) pointed out in their research that urban populations are more willing to participate in pro-environmental behavior. Obviously, our research further confirms their findings. Whether people engage in public pro-environmental behavior or not, religion is definitely a good catalyst. Due to the impact of religion, rural populations gradually hold fewer traditional concepts and become more public-minded. However, the majority of rural people who don't believe in religion tend to have more narrow egos. Just as the saying goes, "Each one minds his own business, doesn't bother about the frost on his neighbor's roof". In contrast, since most urban people have higher incomes and higher education, they have a higher awareness of environmental protection and are more willing to engage in public pro-environmental

behavior. Due to the impact of religion, urban people further deepen their understanding of environmental protection on the moral level and are more willing to turn environmental protection into actual public pro-environmental behavior.

Fourth, we found that there are household differences in the impact of religious beliefs on public pro-environmental behavior. Specially speaking, religious believers who own the housing property rights by themselves or their spouse are more willing to engage in public pro-environmental behavior. However, religious believers who don't have housing property rights are less engaged in public pro-environmental behavior than that with housing property rights. Some studies have confirmed that individuals living in family environments are more willing to participate in environmental behavior, while those living in hotels are not willing to engage in environmental behavior (Miao & Wei, 2013). This is related to the consciousness of norms. When the housing property rights belongs to oneself or a spouse, individuals develop self-discipline consciousness and are responsible for the house and the surrounding environment. It must be noted that housing has special meaning for Chinese people. Since ancient times, there has been a saying of "live and work in peace". Individuals pursue higher goals such as realizing social values after they obtain their own houses. Due to the influence of religion, individuals further strengthen their own moral standard and social responsibility and learn to live in harmony with nature. Under these circumstances, individual norms gradually convert to public norms. In other words, religious believers who have their own houses are more willing to engage in public pro-environmental behavior. In contrast, religious believers who don't have their own houses are still fighting for a home. Even if they are influenced by religion, they also don't have the time and ability to engage in public pro-environmental behavior.

Fifth, we found that political participants with religious beliefs are more willing to participate in public pro-environmental behavior than those without religious beliefs. Some scholars have confirmed that there is a connection between religion and politics (Yang & Huang, 2018). It's not too difficult to find that political participants will pay attention to various public issues, including environmental protection. Furthermore, there is a strong relationship between religious beliefs and public pro-environmental behavior. If political participants are religious believers, it will play a "icing on the cake" effect on public pro-environmental behavior. In other word, these people are more willing to turn environmental concerns into actual environmental behavior.

Lastly, we test the mediating effect of environmental risk perception. We found that environmental risk perception can act as a partial mediator. In other words, religious believers have higher environmental risk perception. High environmental risk perception can easily transform into environmental behavior to prevent risks. The perception of environmental risk is important to environmental protection. As is known to all, different perceptions of environmental risk will lead to different environment behaviors. Risk perception is an intermediate link. This is related to whether the individual's environmental concerns can transform into real environmental behavior. Some individuals may have high environmental concerns, but they will not engage in environmental behavior. For religious believers, they pay more attention to public environmental

issues. Under these circumstances, they are more sensitive to public environmental risk. Thus, once they are at a higher public environmental risk, they will quickly turn their environmental concerns into public pro-environmental behaviors.

Our research is quite exciting and expected. The complex positive relationship between religion and public pro-environmental behavior provides an important reference for the construction of ecological civilization. In a word, whether it's the new environmental paradigm in the West or "*Tianren Heyi*" in China, religion is deeply embedded in the local cultural background and is shaped by politics and society. Even if two people have the same religious beliefs, their willingness to engage in public pro-environmental behavior will vary greatly due to different economic, social, cultural, and political backgrounds. When we explore the relationship between religion and public pro-environmental behavior, we should not separate religion from other factors. In the final analysis, religion is not a determining factor but an influencing factor. When the time is ripe, religion will strengthen public pro-environmental behavior. This study has its limitations. First of all, we employed the cross-sectional data to study the relationship between religion and public pro-environmental behavior in the Chinese context. This only depicted the relationship between these two variables at the node in 2013. Our research has not yet answered whether the relationship has changed over time, because CGSS is not the tracking data. In future research, we will attempt to adopt the panel data to examine the changing trend of this relationship and use different datasets to compare our findings. Second, we calculated the value of each variable mainly by summation. This only depicted the general trend between these two variables. In the future research, we will attempt analysis to further test the relationship between religion and public pro-environmental behavior.

Acknowledgements: This research was financially supported by the National Social Science Foundation of China (Grant No. 18VZL009). The authors would like to thank the editors and reviewers for providing valuable comments that helped us to improve the manuscript.

Author Contributions: Sheng Zeng contributed in writing the original draft, conceptualization, data curation, formal analysis, methodology, reviewing, and editing. Lin Wu and Tianyuan Liu contributed in supervision of the paper. The authors jointly edited and approved the final manuscript.

Conflict of Interest: The authors declare no conflict of interest.

References

Beisner, E. C. 2001. Review : Where Garden Meets Wilderness : Evangelical Entry into the Environmental Debate. *Nova Religio: The Journal of Alternative and Emergent Religions*, *4*(2), 362–363.

Berry, E. 2013. Religious Environmentalism and Environmental Religion in America. *Religion Compass*, *7*(10), 454–466.

Bubeck, P., Botzen, W. J. W., & Aerts, J. C. J. H. 2012. A Review of Risk Perceptions and Other Factors that Influence Flood Mitigation Behavior. *Risk Analysis*, *32*(9), 1481–1495.

Catton, W. R., & Dunlap, R. E. 1978. ENVIRONMENTAL SOCIOLOGY: A NEW PARADIGM. *American Sociologist*, *13*(1), 41–49.

Chinese Family Panel Studies (CFPS). 2012. Available online: http://www.isss.pku.edu.cn/cfps/EN/Data/2012/244.html (accessed on 16 August 2017).

CGSS. 2013. Chinese General Social Survey (中国综合社会调查). Available online: http://www.chinagss.org/index.php?r=index/publication (accessed on 17 July 2017)

Chen, X., Peterson, M. N., Hull, V., Lu, C., Lee, G. D., Hong, D., & Liu, J. 2011. Effects of attitudinal and sociodemographic factors on pro-environmental behaviour in urban China. *Environmental Conservation*, *38*(1), 45–52.

Clements, J. M., McCright, A. M., & Xiao, C. 2014. Green Christians? An Empirical Examination of Environmental Concern Within the U.S. General Public. *Organization and Environment*, *27*(1), 85–102.

Du, X., Jian, W., Zeng, Q., & Du, Y. 2014. Corporate Environmental Responsibility in Polluting Industries: Does Religion Matter? *Journal of Business Ethics*, *124*(3), 485–507.

Dunlap, R. E., & Liere, K. D. Van. 2008. The "New Environmental Paradigm." *Journal of Environmental Education*, *40*(1), 19–28.

Dunlap, R. E., Liere, K. D. Van, Mertig, A. G., & Jones, R. E. 2000. New Trends in Measuring Environmental Attitudes: Measuring Endorsement of the New Ecological Paradigm: A Revised NEP Scale. *Journal of Social Issues*, *56*(3).

Eckberg, D. L., & Blocker, T. J. 1989. Varieties of Religious Involvement and Environmental Concerns : Testing the Lynn White Thesis. *Journal for the Scientific Study of Religion*, *28*(4), 509–517.

Hadler, M., & Haller, M. 2011. Global activism and nationally driven recycling: The influence of world society and national contexts on public and private environmental behavior. *International Sociology*, *26*(3), 315–345.

Haluza-Delay, R. 2000. Green Fire and Religious Spirit. *Journal of Experiential Education*, *23*(3), 143–149.

Harper, F., & Kennealy, S. 2009. Greening Our Faith: Putting Belief into Action. *Anglican Theological Review*, *91*(4), 619.

Harris, P. G. 2006. Environmental perspectives and behavior in China: Synopsis and bibliography. *Environment and Behavior*, *38*(1), 5–21.

Hayes, B. C. ., & Marangudakis, M. 2019. Religion and Environmental Issues within Anglo-American Democracies, *42*(2), 159–174.

Hoffman, A. J., & Sandelands, L. E. 2005. Getting right with nature: Anthropocentrism, ecocentrism, and theocentrism. *Organization and Environment*, *18*(2), 141–162.

Kearns, L. 1996. Saving the Creation: Christian Environmentalism in the United States. *Sociology of Religion*, *57*(1), 55.

Lindell, M. K., & Hwang, S. N. 2008. Households ' Perceived Personal Risk and Responses in a Multihazard Environment, *28*(2).

Lynn White, J. 1967. The Historical Roots of Our Ecologic Crisis Lynn. *Science*, *155*(3767), 1203–1207.

Maloney, M. P., Ward, M. P., & Braucht, G. N. (1975). A revised scale for the measurement of ecological attitudes and knowledge. *American Psychologist*, *30*(7), 787–790.

Miao, L., & Wei, W. 2013. Consumers' pro-environmental behavior and the underlying motivations: A comparison between household and hotel settings. *International Journal of Hospitality Management*, *32*(1), 102–112.

O'Connor, R. E., Bord, R. J., & Fisher, A. 1999. Risk perceptions, general environmental beliefs, and willingness to address climate change. *Risk Analysis*, *19*(3), 461–471.

Pickering, K., & Jewell, B. 2008. Nature is Relative: Religious Affiliation, Environmental Attitudes, and Political Constraints on the Pine Ridge Indian Reservation. *Journal for the Study of Religion, Nature and Culture*, *2*(1), 135–158.

Sherkat, D. E., & Ellison, C. G. 2007. Structuring the religion-environment connection: Identifying religious influences on environmental concern and activism. *Journal for the Scientific Study of Religion*, *46*(1), 71–85.

Sherkat, D. E., & Ellison, C. G. 2019. Structuring the Religion-Environment Connection : Identifying Religious Influences on Environmental Concern and Activism Structuring the Religion-Environment Connection : Identifying Religious Influences, *46*(1), 71–85.

Sjöberg, L. 2000. Factors in risk perception. *Risk Analysis*, *20*(1), 1–12.

Slimak, M. W., & Dietz, T. 2006. Personal values, beliefs, and ecological risk perception. *Risk Analysis*, *26*(6), 1689–1705.

Slovic, P. 1999. Trust, emotion, sex, politics, and science: Surveying the risk-assessment battlefield. *Risk Analysis*, *19*(4), 689–701.

Slovic, P., & Peters, E. 2006. Risk perception and affect. *Current Directions in Psychological Science*, *15*(6), 322–325.

Smith, A. M., & Pulver, S. 2009. Ethics-based environmentalism in practice: Religious-environmental organizations in the United States. *Worldviews: Environment, Culture, Religion*, *13*(2), 145–179.

Wallace, M. 2008. The New Green Christianity: Why The Church Is Vital To Saving The Planet. *Word And World*, *28*(1), 75.

WEN Zhonglin, & Baojuan, Y. 2014. Analyses of Mediating Effects: The Development of Methods and Models. *Advances in Psychological Science*, *22*(5), 731–745.

WIN-Gallup International. 2012. Global Index of Religiosity and Atheism. Available online: http://www.wingia.com/web/files/news/14/file/14.pdf (accessed on 17 September 2017)

Woodhouse, E., Mills, M. A., McGowan, P. J. K., & Milner-Gulland, E. J. 2015. Religious relationships with the environment in a Tibetan rural community: Interactions and contrasts with popular notions of indigenous environmentalism. *Human Ecology*, *43*(2), 295–307.

Woodrum, E., & Wolkomir, M. J. 1997. Religious effects on environmentalism. *Sociological Spectrum*. 17:2, 223-

234.

Xi Jinping. 2013. Promote Friendship Between Our People and Work Together to Build a Bright Future. Available online: http://politics.people.com.cn/n/2013/0908/c1024-22845281.html (accessed on 8 September 2013).

Xiao, C., & Hong, D. 2010. Gender differences in environmental behaviors in China. *Population and Environment*, *32*(1), 88–104.

Xing, Y., & Starik, M. 2017. Taoist leadership and employee green behaviour: A cultural and philosophical microfoundation of sustainability. *Journal of Organizational Behavior*, *38*(9), 1302–1319.

Yang, Y., & Huang, S. 2018. Religious beliefs and environmental behaviors in China. *Religions*, *9*(3), 1–12.

YAO, X. 2014. An Eco-Ethical Interpretation of Confucian " Tianren Heyi ". *Frontiers of Philosophy in China*, *9*(4), 570–585.