

## Article

# Risk Preference and Religious Beliefs: A Case in China

Dao Zhou

Institute for the Study of Buddhism and Religious Theory, Renmin University of China, Beijing 100872, China; dao.zhou@ruc.edu.cn

**Abstract:** Risk preference theory states that religiosity positively correlates with risk aversion. Based on data from the 2018 wave of the China Family Panel Studies (CFPS), this study tested risk preference theory in the Chinese mainland. A binary logistic regression model was used to empirically test the relationship between risk preference and religious belief. At the same time, a robustness test was carried out using the propensity score-matching method and other datasets, and multinomial logistic regression was conducted to explore the heterogeneity of the relationship between risk preference and religious belief. The results showed that risk-seeking people are more likely to have religious beliefs. The importance of the study lies in the extension of risk preference theory to consideration of religious regulations.

**Keywords:** Chinese religions; risk preference; compensatory control theory; religious regulations

## 1. Introduction

Risk preference theory was first proposed to explain gender differences in religiosity, suggesting that religiosity is negatively correlated with risk preference and that men are less religious than women because men are more willing to take risks (Miller and Hoffmann 1995). Risk preference is here considered a stable personal trait that measures the degree to which people are willing to put themselves in rewarding situations that involve potential loss (Hoffmann 2019). Risk preference theory's credibility and application scope have been controversial since it was put forward (Li et al. 2020). Even Miller himself, the author of the theory, thought that risk preference theory does not apply to East Asia, where non-exclusive religions are pervasive (Miller 2000). However, similarly to risk preference theory, which regards risk preference as the psychological basis of religious belief, several empirical studies in China (Zheng et al. 2010; Ruan and Liu 2012) also show a negative relationship between religious belief and risk preference, finding that people believe in religion for reasons of risk avoidance. The reason why the research conclusions regarding China and Western countries are inconsistent lies in the internal tension of risk preference theory. In particular, risk preference theory integrates the religious rational choice theory advocated by Miller and the power control theory from criminology represented by Hoffman. Although the two theories overlap in the social background dominated by the Christian religion in the West, differences between the two still exist, and are particularly evident, in China.

According to Hoffmann's conclusion, the inconsistencies between previous studies on risk preference and religiosity are related to indirect and subjective measures of risk preference (Hoffmann 2019). In order to make up for the shortcomings of previous studies, this study measures the attractiveness of uncertain choices for individuals in the manner of a monetary gamble and constructs a risk preference index to measure risk preference in behavior (Hsee and Weber 1997). Moreover, considering the polytheistic religious system in the Chinese mainland, the concept of religious belief in this study is based on deities and includes believers without denominational affiliation but belief in a specific deity (Zhang and Lu 2020), facilitating a division of Eastern and Western institutional religions and folk beliefs (Zhang et al. 2021). On this basis, this study attempts to sort out the theoretical



**Citation:** Zhou, Dao. 2022. Risk Preference and Religious Beliefs: A Case in China. *Religions* 13: 1072. <https://doi.org/10.3390/rel13111072>

Academic Editor: Marcin Wnuk

Received: 4 October 2022

Accepted: 4 November 2022

Published: 7 November 2022

**Publisher's Note:** MDPI stays neutral with regard to jurisdictional claims in published maps and institutional affiliations.



**Copyright:** © 2022 by the author. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<https://creativecommons.org/licenses/by/4.0/>).

basis and development of risk preference theory and examine the relationship between risk preference and religious belief in the context of the Chinese mainland.

### *1.1. Pascal's Wager: From Theology to Psychology*

In order to better explain how risk is measured in risk preference theory, this study begins with a brief explanation of Pascal's wager, which is regarded as a pioneer of risk preference theory (Miller and Hoffmann 1995). Pascal's wager takes numerous forms; in a widely accepted version that views it as a risky decision under uncertainty, Pascal's wager on reason as a method of faith, on obtaining eternal life in heaven, illustrates that unbelief is an irrational action on a prudential basis (Wainwright 2005, p. 169). Specifically, there are two possibilities, the existence or non-existence of God, and a person can choose whether or not to believe. By comparing the expected utility of believing or not believing in God, it is clear that the expected utility of believing in God is greater because the expected utility is always infinite in the case of believing in God. Since belief in God satisfies the rational requirement of maximum expected utility, one should believe in God.

In Pascal's wager, the following three presuppositions are of particular interest. Firstly, Pascal's wager is universal. This means that Pascal's wager is a game open to all and that everyone participates in it with their limited lives. Secondly, viewing Pascal's wager as a risky decision requires that belief in God be infinitely rewarding, and the requirement of infinite reward is secondary to the requirement of universality. In fact, the universality requirement implies that there are some atheists who believe in God with a very low subjective probability and that an infinite payoff ensures that the expected utility is infinite when multiplied by a small probability (Anderson 1995). Finally, Pascal's wager is apologetic in nature. The apologetic nature of Pascal's wager means it is directed against the Christian religion. If one leaves aside the Christian religion, Pascal's wager is simply a theoretical narrative in which it is rational to believe in a God who can give the believer an infinite reward. Thus, the "many gods" objection to the nature of patronage is considered a rebuttal sufficient to reveal the irrationality of Pascal's wager, which is questionable in the context of the existence of multiple gods (Saka 2001).

Despite these three presuppositions, the significance of Pascal's wager lies in the fact that it provides, on the one hand, a method of risk analysis that seeks to maximize expected utility and, on the other hand, suggests the religious psychology behind the wager that Pascal himself represented in his quest for "wholeness" or "totality". In terms of the wager itself, Pascal was not "betting" on his salvation in a deterministic sense but basing his existence on the existence of God. In Lucien Goldmann's interpretation, Pascal's God is a metaphor for what is seen as "wholeness" or "totality" (Goldmann 2013, p. 180) that eschews theological meaning. This "wholeness" or "totality" explains the paradoxical and apparently incomprehensible nature of the human condition (Goldmann 2013, p. 305). In terms of the reason for the bet, Pascal's wager reflects the recourse to the supernatural to seek an explanation for a situation where limited reason cannot synthesize a divided reality.

Similarly to the risk analysis approach, this religious psychology of the quest for "wholeness" is pervasive. Pascal's quest for "wholeness" or "totality" is a quest for meaning; people need to explain what is happening, and religion can be a source of explanation. Stark, for example, asserts that the everlasting basis for religion is the human conviction and hope that life has meaning (Stark 2017, p. 235). Thus, after excluding the theological part of Pascal's wager concerning the Christian religion, Pascal's wager can psychologically answer the question of why people are religious using psychology.

### *1.2. Risk Preference Theory: Foundation and Extension*

When first proposed, risk preference theory followed the approach to risk analysis in Pascal's wager, but it focused on the situation where people do not believe in religion. According to the logic of the Christian religion, abandonment of faith means abandoning the possibility of salvation, and on this basis, Miller and Hoffman saw irreligion as a risk factor that could bring losses to people (Miller and Hoffmann 1995). This risk factor

judgment is highly contextual in nature, which means that Miller and Hoffman make this judgment in the context of the religious environment of overwhelming Christian belief found in American society. In this environment, people are taught that the only way for people to get to heaven is to become Christian (Miller 2000).

Therefore, subsequent researchers who have replicated the study using other datasets and measures have found that risk preferences do not explain gender differences in religiosity (Freese 2004; Freese and Montgomery 2007). For this reason, scholars have questioned and criticized the findings and methodology of Miller and Hoffman's study. Although risk preference theory faces many criticisms, this does not negate the significance of risk preference theory itself. According to Hoffmann (2019), his and Miller's research (1995) has several advantages. The first is that, even though scholars have questioned the validity of risk preference theory for gender differences in religiousness, they have not offered an alternative and convincing explanation. Thus, at the very least, risk preference theory is one of many theories to be tested and one of the few that provides empirical evidence (although this is also questioned). Second, risk preference theory is not just a theory; it can serve the development of realistic gender-sensitized programs because of its criminological roots. Finally, Miller and Hoffman's study provides a risk analysis paradigm that makes it possible for risk preference theory research to break through the initial gender issue and apply the theory to issues such as race and ethnicity. In addition, this study argues that the importance of Miller and Hoffman's research also lies in their use of Pascal's wager to reveal the motivation for people to believe in religion behind risk preferences; i.e., the search for certainty and meaning. This suggests that risk preference theory is a transitional theory between macroscopic sociological and microscopic psychological theories. Thus, risk preference theory can be expanded not only by explaining the religious differences of different social groups, as Hoffman suggests, but also by asking about the motivations behind different categories of religious beliefs at the micro- level.

Nevertheless, the definition of risk preference is more ambiguous than the relatively more explicit definition of a risk factor, and the explanation of why religious risk preference emerges is the more difficult part.

Leaving aside risk preference theory, the measurement of risk appetite has, in general, two traditions: psychological and behavioral sciences (Mata et al. 2018). Specifically, the former uses a self-report approach, while the latter uses an experimental approach. In studies related to risk preference theory, self-report measures of risk appetite are primarily used. This self-reporting is also mostly indirect. Miller and Hoffman initially used attraction to risk and adventure to measure risk preferences. In subsequent tests of risk preference theory, scholars have estimated risk preferences using a variety of measures, such as socioeconomic status, deviant behavior, beliefs about heaven or hell, and even willingness to walk at night. The confusion over the definition and measurement of risk preference is an important reason why the validity of risk preference theory has not been agreed upon by the academic community (Hoffmann 2019). At the same time, this self-reporting approach faces the charge of cheap talk (Haefel and Howard 2010).

What is even more surprising is that Miller and Hoffman, the originators of the theory, also disagree on the source of risk preferences, with Hoffman stating outright that Miller would not necessarily agree with him (Hoffmann 2009). Hoffman generally represents a non-essentialist understanding of risk preferences, while Miller represents an essentialist understanding of risk preferences. The criterion for distinguishing essentialism from non-essentialism is whether the source of differences in risk preferences is thought to be biological (Sullins 2006). Miller and Stark have falsified Hoffman's hypothesis of nonbelief as a result of socialization (Miller and Stark 2002), and Miller's teacher Rodney Stark has gone further, explaining differences in risk preferences as biological differences (Stark 2002). Stark's radical interpretation has not only been fiercely criticized by gender researchers (Cornwall 2009) but has also been disproved by recent research (Li et al. 2020).

Although Stark's radical biological reduction is undesirable, his rational choice theory and the psychological perspective he adopted in his article are worth studying. Under the rational choice theory is the idea that people always choose a religion based on certain motives. When we examine this motivation minutely, we return to Pascal's wager on the quest for meaning. Therefore, this study here introduces compensatory control theory in an attempt to address this motivation. Compensatory control theory assumes that people have a psychological need to maintain order in their beliefs and to prevent randomness and chaos so that when perceptions of personal control are threatened, people are motivated to believe in religion, which also provides a sense of order. There is a substitution effect between perceptions of self-control and the external control of religion (Kay et al. 2008). Here, the perceptions of self-control refer to an individual's confidence in predicting, influencing, and directing events in the present and future (Kay et al. 2009).

However, it is essential to note that religion is necessary for this theory of compensatory control, which is thus more theoretically extensible. In fact, when a sense of personal control is lacking, not everyone expects an external source of religious control to explain the situation, and there is also the possibility of another attempt to restore self-control (Alper and Sümer 2019), which is associated with self-construal and may lead to involvement in superstitious rituals. Thus, the inclusion of risk preferences in compensatory control theory reveals that, while risk preferences may lead to the abandonment of religion as external control in a Western religious context, they do not prevent the search for superstition. As superstition itself does not provide a sense of order and does not carry the characteristics of external control, the search for superstition reflects the need for increased personal control. It can be inferred from this that risk appetite implies exposure to greater uncertainty and that the search for greater personal control amid greater uncertainty is a natural idea.

### 1.3. Related Research in China

There is little research that tests risk preference theory in the Chinese mainland. Several similar studies have discussed religion as a means of risk aversion. The difference between the two is noteworthy in that those who identify religion as a means of risk aversion are, in fact, speaking of a theory of a secure society (Norris and Inglehart 2004), which is to say that religious beliefs come from a lower level of social security and to imply that religion declines with economic development. Security theory may explain secularization at a macro level, but this study does not believe that the theory can explain the religious revival in China (Zhai 2010) in reverse. In fact, religion is flourishing in certain economically developed areas of China, like Fujian province (Ruan and Liu 2012).

Liu (2010) replicated Miller and Hoffman's study using data from Taiwan province and found a significant negative relationship between risk preferences and religious participation and explained the greater religious participation of risk-averse individuals as avoidance of possible penalties for not believing in religion, such as going to hell after death. However, note that Liu Yang's interpretation of religion as loss aversion differs from Miller et al.'s interpretation of religion as reward-seeking (a pleasant afterlife). In fact, according to the framing effect, in the condition of loss, those who choose a risky loss are more risk-seeking than those who prefer a definite loss (Kahneman and Tversky 1984). Theologically speaking, non-participation in religious practice is inevitably followed by religious punishment (a definite loss) after death. In contrast, participation in religious practice may be followed by religious punishment (a risky loss) after death. Therefore, under Liu's interpretation, it is the risk-seeking who should be more involved in religious participation rather than the other way around. It is, therefore, more reasonable to view the motivation to believe in religion as reward seeking than as loss aversion.

Having clarified the motivation for believing in religion, another point that needs to be clarified is the measurement of religiosity. Theoretically, the earliest conceptualization of religiosity comes from Glock's (1962) division of the five dimensions of religiosity into belief, practice, feeling, knowledge, and effects. Later scholars simplified or adapted Glock's five-dimensional model and demonstrated measurement invariance in actual cross-

cultural studies (Saroglou et al. 2020). Saroglou et al. showed that, in Taiwan province of China, religiosity can also be classified into four dimensions: believing, bonding, behaving, and believing. The noteworthy point is that religious beliefs/believing have been seen as necessary among the many models of religiosity dimensions (Hinde 2009; Atran and Norenzayan 2004). Specifically, religious beliefs include the beliefs in transcendence and the ideal of truth, especially regarding the big existential questions (Saroglou 2011). At the same time, because the content of specific beliefs varies from religion to religion, religious beliefs are also seen as a marker to distinguish different religions. Therefore, in terms of research topics, since religious beliefs are concerned with religion's cognitive or ideological aspects, they are more in line with the metaphysical anxieties involved in risk preference theory. As Pascal's wager reveals, man takes God as the basis of his existence to eliminate the uncertainty that reason cannot eliminate. Furthermore, empirical studies have shown that, in the Chinese mainland and regarding social desirability pressure, asking whether one believes in a supernatural deity or other object is a better way to identify religious people than asking about their denominational affiliation (Zhang and Lu 2020). In addition, in the Chinese mainland, neither self-reported religious affiliation nor the frequency of religious practice by the same individuals have been stable over the years (Francis-Tan and Tian 2022). Therefore, this study argues that using religious beliefs to measure religiosity is more reliable and accurate.

In addition to the above discussion, applying risk preference theory in the Chinese mainland should also consider the religious regulations. On the one hand, atheism is the official ideology of China. The Communist Party of China (CPC), guided by Marxism, practices atheism education in the Chinese mainland, and this education is believed to be the reason for the low number of believers on the mainland (Zhai 2010). On the other hand, only institutional religions are regulated. Some folk beliefs are unregulated and unrecognized in the Chinese mainland (Zhou 2017) and are in a religious gray zone between the legal and illegal (Yang 2006). These two features of Chinese religious regulations imply that practicing religion in the Chinese mainland is risky in terms of social implications. Indeed, as of 2013, around 10% of Chinese people still had worse attitudes towards those with religious beliefs than those without (Li 2017), and religious believers face a certain amount of social pressure that may lead to depression (Hu et al. 2017). Furthermore, many of China's elites are unwilling to express their religious beliefs openly due to their status, so spiritual selfishness occurs (Jiang and Yang 2019).

Under the religious regulations of the Chinese mainland, unlike the Judeo-Christian-Islamic tradition, having a religious belief may be risky and against mainstream society. Therefore, this study proposes the following hypothesis:

**Hypothesis 1.** *In the Chinese mainland, there is a positive relationship between risk preference and religious belief.*

The previous paragraph distinguishes, from the perspective of religious regulations, between institutional religions, which are regulated, and folk religions, which are unregulated, and there are differences in the reasons why Chinese people believe in institutional religions and folk religions. From the perspective of compensatory control theory, this study argues that Chinese people believe in folk religions to enhance their sense of personal control, while those who believe in institutional religions seek a sense of external control; i.e., to place the meaning of their lives in an external theology. This difference in belief psychology stems primarily from the lack of theology in folk religions. In light of this difference, although hypothesis 1 affirms that there is some social risk in being religious in China, this secular risk may be insignificant because of the religious theology that devout institutional religious believers need to guide their lives. This phenomenon can be supported by the fact that Chinese and Western studies have shown an inverted, U-shaped, nonlinear relationship between religious commitment and depression (Wei and Liu 2013). However, it should be noted that, in the Chinese mainland, religious commitment among folk believers

is maintained at a very low level (Zhang et al. 2021). It is difficult for folk believers to ignore this risk by increasing their commitment. In contrast, institutional religion requires more commitment from believers. Therefore, under the influence of various religious and theological worldviews, institutional religious believers may not be sensitive to secular social risks. This study, therefore, proposes the following hypothesis:

**Hypothesis 2.** *In the Chinese mainland, the relationship between risk preference and religious beliefs is heterogeneous between institutional religions and folk religions.*

Further, this study attempts to explore the sources of risk preferences. In Chinese folk religions, the poor and the rich have a higher proportion of beliefs than the middle class (Yang and Hu 2012), reflecting a psychological or real disadvantage. In the context of the folklorization of major institutional religions in the Chinese mainland, this paper argues that this pattern of beliefs, in which both the poor and the rich have higher proportions of beliefs compared to the middle class, can be generalized to all religions in the Chinese mainland. This implies a possible U-shaped relationship between income and religiosity. At the same time, such a pattern is consistent with compensatory control theory's explanation of lack of control as a motivation for belief in supernatural forces. Therefore, this paper argues that seeking compensation for a sense of control can be seen as a motivation for belief and can explain the U-shaped relationship between income and religiosity. The poor and the rich can be seen as more risk-seeking than the middle class: on the one hand, the poor are willing to take risks to change their situation and, on the other hand, the rich are more willing to take risks to pursue greater benefits. Therefore, this study proposes the following hypotheses:

**Hypothesis 3.** *In the Chinese mainland, there is a U-shaped relationship between household income and having religious beliefs.*

**Hypothesis 4.** *In the Chinese mainland, risk preference mediates the effect of income on religiosity.*

## 2. Methodology

### 2.1. Data

This study used publicly available data from the 2018 wave of the China Family Panel Studies (CFPS 2018) conducted by the Institute of Social Science Survey (ISSS) at Peking University. The CFPS samples cover 25 provinces/municipalities/autonomous regions, and the target sample size was 16,000 households. The investigation objects include all the family members in the sample households, comprehensively reflecting the situation of all aspects of Chinese society. Note that the author did not participate in the investigation project. In accordance with the research needs, participants younger than 18 years old and samples with missing data or with participants who refused to answer required variables were deleted in this paper. Finally, the number of valid samples was 24,734. The advantage of choosing the data from the CFPS 2018 survey is that it provides a specific measure of risk preference in behavior and a broader measure of religious belief, which meets the research requirements well.

### 2.2. Measures

The dependent variable selected in this study was religious belief. Considering the possible existence of polytheism among Chinese people, this study followed the classification of religious beliefs outlined by Zhang et al. (2021). Zhang et al. showed that the deity-centered measure of religious beliefs was more accurate in delineating religious people in the Chinese mainland. Religious beliefs were here divided into four categories: single Eastern religious belief, single Western religious belief, folk belief, and non-belief. It should be noted that ancestor worship has multiple meanings in Chinese culture (Hu and Li 2021), and ancestors are not supernatural in the way that the questions in the CFPS 2018

survey asked. Therefore, ancestor worship was not regarded as a religious belief in this study, and the category of “no religious belief” in this study included those who believe only in ancestors, in addition to those who do not believe in any deity. In order to maintain consistency with previous studies, this study also combined the four categories of religious belief into two categories to generate a new dichotomous variable.

The core explanatory variable in this study was risk preference. The results of the risk experiment in the CFPS 2018 survey were used to generate a risk preference index following Hsee and Weber’s (1997) method. Compared with the previous methods using subjectively stated attitudes to measure risk preference, the risk preference index based on actual decisions is thought to have greater external validity (Hsee and Weber 1997).

In order to eliminate the influence of missing variables on the estimation, this study constructed gender, age, ethnicity, marital status, urban and rural areas, educational years, logarithmic family income, and health status as control variables by referring to previous studies (Francis-Tan and Tian 2022). The descriptive statistical results of the main variables are shown in Table 1.

**Table 1.** Descriptive information for variables in the CFPS 2018 survey (N = 24,743).

Variable	Measure	Mean	S.D.
Religious belief	Belief in Buddha, Taoist god, Allah, God, Jesus Christ, ghosts, or geomancy = 1, other = 0	0.580	/
Folk religion	Belief in more than one deity or belief in ancestor only = 1, other = 0	0.537	/
Eastern religion	Only belief in Buddha/Bodhisattva or Taoist deity = 1, other = 0	0.024	/
Western religion	Only belief in Allah, God, or Jesus Christ = 1, other = 0	0.019	/
Risk preference (1–6)	The higher the number, the higher the risk preference	2.263	1.781
Age	Years	47.917	16.078
Marriage	Married or cohabiting = 1, other = 0	0.812	/
Gender	Male = 1, female = 0	0.498	/
Urban resident	Urban = 1, rural = 0	0.429	/
Family income	The log of the total income of the family over the past 12 months plus 1	10.607	1.057
Ethnic minority	No = 1, yes = 0	0.851	/
Education years	Years	8.050	4.954
Subjective health (1–5)	The higher the number, the less healthy	3.058	1.121

### 2.3. Analytic Methods

The relationship between personal religious belief and risk preference was the core research topic of this study. In order to better demonstrate this relationship, this study divided the analysis process into four steps and gradually went deeper. The first step was replicating Miller and Hoffmann’s study using a binary logit model as a baseline regression model. The second step was testing the robustness of the relationship obtained in the first step using a propensity score-matching approach and other datasets. The third step was testing the heterogeneity in the relationship between risk preference and religious belief. The fourth step was testing whether risk preferences can serve as a psychological mechanism by which family income influences religious belief under compensatory control theory. Statistical analysis was conducted using Stata (Texas, U.S.) version 16.0 and Mplus (Muthén & Muthén) version 8.3.

## 3. Results

### 3.1. Logistic Regression

Model 1 in Table 2 reports the results of a binary logit regression model of the impact of risk preference on religious belief. The regression results show that the influence of risk preference on religious belief still existed after controlling for many factors affecting religious belief. Overall, for every level of increase in risk appetite, there was about a 3% increase in the odds ratio of having a religious belief, holding all other variables constant. There was a significant positive correlation between religious belief and risk preference, and hypothesis 1 was supported. This result is inconsistent with the conclusion from

previous studies in China and elsewhere that risk preference is negatively correlated with religious belief. This means that the previous interpretation of risk preference theory that regards religious belief as pursuing post-death reward (Miller 2000) or avoiding post-death punishment (Liu 2010) is not applicable in the Chinese mainland. Nevertheless, supposing that religious belief is seen as compensation for a perception of self-control (Kay et al. 2009), it would make sense that a higher risk preference would correspond to a higher propensity for religious belief, which is discussed in detail in the concluding section below.

**Table 2.** Regressions for effects of risk preference on the probability of having a religious belief.

	Model 1	Model 2	Model 3
	Full Sample from CFPS Survey	Matched Sample from CFPS Survey	Sample from CGSS
Religious belief			
Risk preference	0.029 *** (0.008)	0.043 *** (0.008)	0.058 *** (0.024)
Age	−0.007 *** (0.001)	−0.009 *** (0.001)	0.008 *** (0.003)
Urban resident	−0.042 *** (0.0196)	−0.022 ** (0.013)	−0.051 (0.088)
Gender (rf: female)	−0.332 *** (0.027)	−0.297 *** (0.029)	−0.243 *** (0.076)
Education years	−0.051 *** (0.003)	−0.052 *** (0.004)	−0.039 *** (0.010)
Ethnic minority	−0.070 (0.105)	0.0107 ** (0.045)	−0.655 *** (0.202)
Marriage (rf: the unmarried)	0.033 (0.036)	0.060 (0.038)	−0.108 (0.087)
Health	0.060 *** (0.011)	0.086 *** (0.013)	0.046 (0.038)
Family income	−0.463 *** (0.120)	−0.627 *** (0.135)	−0.134 *** (0.062)
Square of family income	0.026 *** (0.006)	0.033 *** (0.006)	0.014 *** (0.004)
Province dummy	Yes	Yes	Yes
Intercept	2.800 ** (0.628)	3.622 ** (0.712)	0.523 (0.438)
Inflate			
Age	/	/	0.045 *** (0.006)
Ethnic minority	/	/	−0.700 *** (0.300)
Intercept	/	/	−1.788 *** (0.515)
N	24,743	21,276	3925

\*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.00$  (two-tailed test); standard error in parentheses.

### 3.2. Robustness

To further test the robustness of risk preference’s effect on religious belief, we used a propensity score-matching (PSM) method to control selection bias. Considering that the processing variables in propensity score matching are dichotomous, this study merged levels two to six from the original risk preference index. The balance test was carried out after the propensity score matching, and the test result showed that the standard deviation of most variables was less than 5%. At the same time, the t-test results did not reject the null hypothesis that there was no difference between the treatment group and the control group, so the balance hypothesis could be accepted. The regression results of matched samples are shown in model 2 in Table 1, in which the coefficient of risk preference was significantly positive. This indicates that the positive correlation between risk preference and having religious beliefs is robust and more strongly supports hypothesis 1.

In general, the measurement of risk preferences has two traditions: psychological and behavioral sciences. Specifically, the former uses self-report methods and the latter uses experimental methods. In studies related to risk preference theory, researchers have mainly used self-report measures of risk preference. Furthermore, measures of religiosity in China exist that are centered on religious participation, in addition to deity-centered measures. This study attempted to revalidate this relationship using other datasets to further confirm the robustness of the positive association between risk preferences and religiosity. This study used data from the 2018 wave of the Chinese General Social Survey (CGSS 2018) to test hypothesis 1. The Chinese General Social Survey was a national sample survey with a good representative sample. Note that the author did not participate in the investigation project. In the CGSS 2018 data, risk preferences were measured using subjectively reported

risk attitudes, while religiosity was measured by the number of times parties prayed for good luck in the past year (religious participation). The detailed definitions and measures of the main variables are presented in Table 3. Model 3 in Table 2 reports the regression of risk preferences for the number of times praying for good luck in a zero-inflated negative binomial model. The reason for using the zero-inflated negative binomial model was that 3048 of the 3925 samples never prayed for good luck; i.e., there were too many zeros in the sample. Furthermore, according to the information criterion, the AIC (6219.17) and BIC (6325.85) values of the zero-inflated negative binomial model were lower than the AIC (6657.93) and BIC (6745.78) values of the negative binomial model. The coefficient of risk preference in model 3 was 0.058, which was significant at the 0.01 level of significance. The implication is that the mean value of the number of prayers increased by about 6% for each level of subjective risk appetite, controlling for other variables. This demonstrates that the positive relationship between risk preference and religious belief persists across datasets and after changing the measurement, further supporting hypothesis 1.

**Table 3.** Descriptive information for variables in the CGSS 2018 (N = 3925).

Variable	Measure	Mean	S.D.
Religious belief	The number of times parties prayed for good luck in the past year	0.413	0.963
Risk preference (1–7)	The higher the number, the higher the risk preference	3.559	1.573
Age	Year	51.416	16.898
Marriage	Married or cohabiting = 1, other = 0	0.760	/
Gender	Male = 1, female = 0	0.480	/
Urban resident	Urban resident = 1, rural = 0	0.376	/
Family income	The log of the total income of the family over the past 12 months plus 1	10.432	2.120
Ethnic minority	No = 1, yes = 0	0.931	/
Education years	Year	9.050	4.940
Subjective health (1–5)	The higher the number, the less healthy	3.548	1.076

In addition, it should be noted that, in all models in Table 1, the coefficient of family income was significantly positive, while the coefficient of the square term of family income was significantly negative. This suggests that there is a U-shaped relationship between household income and folk beliefs, meaning that both rich and poor people are more likely to believe in folk beliefs than middle-income people, which is consistent with previous research results (Yang and Hu 2012; Ruan and Liu 2012). Hypothesis 3 is supported.

### 3.3. Heterogeneity

In the Chinese mainland, the rewards of folk religion and institutional religion should not be regarded as the same. As a result, the relationship between religious belief and risk preference may vary among different categories of religious beliefs. Therefore, this study subdivided religious beliefs into folk, Eastern, and Western religious beliefs. With non-believers as the reference, multinomial logistic regression was conducted to explore the heterogeneity of the relationship between risk preference and religious belief. Table 4 reports the results of the regression. Compared with non-believers, more risk-seeking individuals were more likely to have folk beliefs, while risk preference did not affect whether people believe in Eastern or Western religious beliefs. The emergence of this heterogeneity supports hypothesis 2.

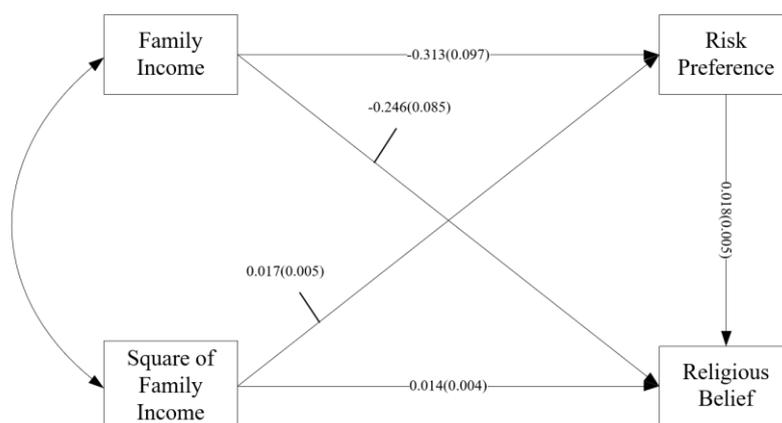
**Table 4.** Multinomial logistic regression for effects of risk preference on having a religious belief.

	Folk Beliefs	Eastern Beliefs	Western Beliefs
Risk preference	0.033 *** (0.014)	−0.010 (0.025)	−0.030 (0.030)
Age	−0.008 *** (0.001)	−0.003 (0.003)	0.006 * (0.004)
Urban resident	−0.045 *** (0.014)	0.018 (0.050)	−0.015 (0.056)
Gender (rf: female)	−0.294 *** (0.027)	−0.700 *** (0.088)	−0.917 *** (0.104)
Education years	−0.051 *** (0.003)	−0.052 *** (0.011)	−0.066 *** (0.012)
Ethnic minority	0.128 (0.044)	−0.031 (0.146)	−1.375 *** (0.131)
Marriage (rf: the unmarried)	0.019 (0.036)	−0.002 (0.113)	0.563 *** (0.142)
Health	0.069 *** (0.012)	−0.076 ** (0.035)	0.010 (0.004)
Family income	−0.469 *** (0.122)	−0.203 (0.318)	−0.515 * (0.294)
Square of family income	0.027 *** (0.006)	0.007 (0.016)	0.028 * (0.015)
Province dummy	Yes	Yes	Yes
Intercept	2.643 ** (0.634)	−0.234 (1.683)	0.448 (1.532)
Risk preference		24,743	

\*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.00$  (two-tailed test); standard error in parentheses.

### 3.4. Mediation Analysis

The baseline regression showed a U-shaped quadratic relationship between family income and religious belief. This study further used Hayes and Preacher’s method to conduct a test for mediating effects of the nonlinear path, which employs first-order partial derivatives to estimate the instantaneous indirect effect of the independent variable affecting the dependent variable through the mediating variable  $\theta$  and statistical inference using the bootstrap method (Hayes and Preacher 2010). Figure 1 reports the results of a path analysis in which family income influenced religious belief through risk preferences and for which demographic variables were controlled for but omitted from the figure. A bootstrap method with 10,000 samples yielded  $\theta$  and 95% confidence intervals of  $-0.003$  [ $-0.005, -0.001$ ] and  $0.006$  [ $0.004, 0.007$ ] when household income was at low and high levels, respectively, with a difference of  $0.011$  [ $0.006, 0.012$ ]. All confidence intervals without 0 indicated significant mediating effects, specifically explained by the fact that households with lower family income have a negative effect on religiosity through risk preference when increasing their income, while households with higher household income increase the likelihood of religiosity by affecting risk preference when increasing their income. Therefore, there is a mediating effect for risk preference in the effect of family income on religious belief, and hypothesis 4 is supported.



**Figure 1.** Path model for estimating the instantaneous indirect effect of family income on religious belief through risk preference.

## 4. Conclusions and Discussion

This study was the first attempt to explore the relationship between risk preference and religiosity in the Chinese mainland using nationwide survey data. Based on a review

of the history of risk preference theory, Pascal's wager, and rational choice theory, this study clarified the shortcomings and applications of risk preference theory and further proposed to extend risk preference theory with compensatory control theory under rational choice theory. The main findings of this study were the positive relationship between risk preference and religious belief and the mediating role of risk preference in the effect of family income on religious belief.

The finding that risk-seeking people are more likely to be religious seems to contradict the findings of previous studies that religions are practiced for risk aversion and is inconsistent with the stereotype that religious believers are more conservative than non-believers. This is partly because there are significant differences between folk beliefs and institutional religions, such as Buddhism and Christianity; on the other hand, it is also important to note that religious believers act conservatively in their lives as a result of the assumption that people are influenced by frugality and the integrity of their teachings (Keister 2003). In contrast, risk preference theory concerns the motivation to believe in religion, and the two cannot be generalized. Even so, it is utilitarian beliefs that are common in the Chinese mainland. It is also unrealistic to require universal adherence to doctrine under utilitarianism, and previous empirical studies have shown that religious identity, such as Christianity, in the Chinese mainland does not have a significant effect on the prevention of individual transgressions (Wang and Jang 2018). Furthermore, considering that, in the Chinese mainland, Buddhism, Taoism, and Christianity are folklorized (Leamaster and Hu 2014), the influence of religious doctrines on people in the Chinese mainland is therefore not universal, which may lead to the inference that people do not choose a religion because of its doctrine. Instead, the abstraction of institutional religion or folk belief as a supernatural force motivates beliefs to be universal.

From the perspective of religious regulation, the findings of this study can be interpreted as suggesting that, in the Chinese mainland, having a religious belief is risky behavior that goes against the social mainstream. However, the heterogeneity of the relationship between risk preferences and religious belief reveals that not all religions are considered risky in China. Multinomial logit regressions suggest that risk-seeking people are more likely to believe in folk religions than institutional religions. The paradox is that many more people believe in folk religions than institutional religions in the Chinese mainland. Under this study's classification, less than 5 percent of the sample believed in only a single institutional religion, while more than 50 percent believed in folk religions. Thus, regarding the social risk of discrimination alone, it should be believers of institutional religions (especially Western institutional religions) who are more likely to be subject to social pressure (Hu et al. 2017).

In this regard, this study offers two explanations. The first interpretation is a criminological one. The moral community thesis proposed by Stark understands religion as "a group property" (Stark 1996). According to the moral community thesis, Stark argues, the influence of religion on individuals arises from the social norms formed by religion. In the Chinese mainland, empirical research has shown that some institutional religious conversions are dependent on social networks (Zhang et al. 2022). In this regard, it can be inferred that institutional religions are seen as risk-free, probably because the believers of institutional religions live in religious communities. Since the residents of communities share the same religion, believers in institutional religions are less likely to suffer from social discrimination. The second perspective comes from theology, according to which the devout believers in institutional religions accept theology as a comprehensive guide to life. Secular social pressures may be irrelevant at this point.

It is worth noting that the two explanations above take institutional religion as the exception. In the Chinese mainland, on the other hand, it is the positive relationship between risk preferences and religiosity that is dominant. Further, beyond religious regulation, this study argues that the causes of religious beliefs among risk-seeking individuals include the privatization of beliefs. The privatization of beliefs implies that religious beliefs are a private matter. The result of this privatization is a move toward mysticism in religion

(Li 2017), in which supernatural elements are retained and normative elements are missing. If the rewards sought by believers in religion may themselves be contrary to social norms, then the positive correlation between risk preferences and religious beliefs is not surprising. For example, in the Chinese mainland, Guan Gong is regarded as a protective deity by some underworld crime groups (Zhang 2005). This privatization of beliefs is consistent with the paradox that previous researchers have found that the sacralization and secularization of religion in the Chinese mainland go hand in hand; i.e., the number of religious believers in China is increasing, but religiosity is decreasing (Liao 2019). On the one hand, from the perspective of sacralization, given the private belief patterns of Chinese people, it is not idealistic to assume that believers in religion are attracted by doctrine and that belief in religion is influenced by doctrine. On the other hand, from the perspective of secularization, it is also not idealistic to assume that religion will die out with socio-cultural development.

However, since belief in religion is seen as risky, what is it that believers seek? Tracing the origins of risk preference theory shows that, since the beginning of Pascal's wager, people have been seeking a sense of order through supernatural forces in order to avoid losing the meaning of life. The theory of compensatory control provides a scheme for obtaining meaning in life outside of theology; namely, an enhanced sense of self-control. This solution is particularly applicable to the Chinese, for whom privatized beliefs are prevalent. In the privatized species of faith, people use religion as a means to an end; essentially, it is to enhance their confidence in future events.

Furthermore, the mediating role of risk preference in the effect of family income on religious belief suggests that there is a material basis for introducing risk preference as a factor in the study of religion. The rich and poor are more likely to be religious than the middle class in the Chinese context. In terms of compensatory control theory, both the rich and the poor suffer greater uncertainty and have greater motivated preferences for risk compared to the middle class. This is also the meaning of the Chinese proverb, "Poor people go to fortune tellers, rich people burn incense, and those who are not poor and not rich do not panic".

In conclusion, there is a positive relationship between risk preferences and religiosity in the Chinese mainland. Although the relationship between risk preference and religiosity is statistically insignificant among institutional religions, this study argues that this is an exception. This also suggests that future research should consider the influence of community context and use multilevel models to further test risk preference theory.

**Funding:** This research received no external funding.

**Institutional Review Board Statement:** Not applicable.

**Informed Consent Statement:** Not applicable.

**Data Availability Statement:** Publicly available datasets were analyzed in this study. These data can be found here: <https://opendata.pku.edu.cn/dataverse/CFPS>, accessed on 20 June 2022; <http://cgss.ruc.edu.cn/index.htm>, accessed on 20 June 2022. The authors did not participate in the investigation project.

**Conflicts of Interest:** The author declares no conflict of interest.

## References

- Alper, Sinan, and Nebi Sümer. 2019. Control Deprivation Decreases, Not Increases, Belief in a Controlling God for People with Independent Self-Constraint. *Current Psychology* 38: 1490–94. [CrossRef]
- Anderson, Robert. 1995. Recent Criticisms and Defenses of Pascal's Wager. *International Journal for Philosophy of Religion* 37: 45–56. [CrossRef]
- Atran, Scott, and Ara Norenzayan. 2004. Religion's evolutionary landscape: Counterintuition, commitment, compassion, communion. *Behavioral and Brain Sciences* 27: 713–30. [CrossRef]
- Cornwall, Marie. 2009. Reifying Sex Difference Isn't the Answer: Gendering Processes, Risk, and Religiosity. *Journal for the Scientific Study of Religion* 48: 252–55. [CrossRef]
- Francis-Tan, Andrew, and Felicia F. Tian. 2022. Fluidity of Faith: Predictors of Religion in a Longitudinal Sample of Chinese Adults. *Journal for the Scientific Study of Religion* 61: 75–99. [CrossRef]

- Freese, Jeremy. 2004. Risk preferences and gender differences in religiousness: Evidence from the World Values Survey. *Review of Religious Research* 46: 88–91. [\[CrossRef\]](#)
- Freese, Jeremy, and James D. Montgomery. 2007. The devil made her do it? Evaluating risk preference as an explanation of sex differences in religiousness. In *Social Psychology of Gender*. Bingley: Emerald Group Publishing Limited, vol. 24, pp. 187–229.
- Glock, Charles Y. 1962. On the Study of Religious Commitment. *Religious Education* 57: 98–110. [\[CrossRef\]](#)
- Goldmann, Luciens. 2013. *The hidden God: A study of tragic vision in the Pensées of Pascal and the Tragedies of Racine*, 1st ed. London: Routledge. [\[CrossRef\]](#)
- Haefel, Gerald J., and George S. Howard. 2010. Self-Report: Psychology's Four-Letter Word. *The American Journal of Psychology* 123: 181–88. [\[CrossRef\]](#)
- Hayes, Andrew F., and Kristopher J. Preacher. 2010. Quantifying and Testing Indirect Effects in Simple Mediation Models When the Constituent Paths Are Nonlinear. *Multivariate Behavioral Research* 45: 627–60. [\[CrossRef\]](#)
- Hinde, Robert A. 2009. *Why Gods Persist: A Scientific Approach to Religion*. London: Routledge.
- Hoffmann, John P. 2009. Gender, Risk, and Religiousness: Can Power Control Provide the Theory? *Journal for the Scientific Study of Religion* 48: 232–40. [\[CrossRef\]](#)
- Hoffmann, John P. 2019. Risk Preference Theory and Gender Differences in Religiousness: A Replication and Extension. *Journal for the Scientific Study of Religion* 58: 210–30. [\[CrossRef\]](#)
- Hsee, Christopher K., and Elke U. Weber. 1997. A Fundamental Prediction Error: Self-Others Discrepancies in Risk Preference. *Journal of Experimental Psychology: General* 126: 45–53. [\[CrossRef\]](#)
- Hu, Anning, and Dongyu Li. 2021. Are Elders from Ancestor-Worshipping Families Better Supported? An Exploratory Study of Post-reform China. *Population Research and Policy Review* 40: 475–98. [\[CrossRef\]](#)
- Hu, Anning, Xiaozhao Yousef Yang, and Weixiang Luo. 2017. Christian sIdentification and Self-Reported Depression: Evidence from China. *Journal for the Scientific Study of Religion* 56: 765–80. [\[CrossRef\]](#)
- Jiang, Jianguo, and Panpan Yang. 2019. Network Pledge: Lucky Game, Spiritual Selfishness and Identity Dilemma. *Exploration and Free Views* 1: 68–75+142–143+145.
- Kahneman, Daniel, and Amos Tversky. 1984. Choices, values and frames. *American Psychologist* 39: 341–50. [\[CrossRef\]](#)
- Kay, Aaron C., Danielle Gaucher, Jamie L. Napier, Mitchell J. Callan, and Kristin Laurin. 2008. God and the government: Testing a compensatory control mechanism for the support of external systems. *Journal of Personality and Social Psychology* 95: 18–35. [\[CrossRef\]](#)
- Kay, Aaron C., Jennifer A. Whitson, Danielle Gaucher, and Adam D. Galinsky. 2009. Compensatory Control: Achieving Order Through the Mind, Our Institutions, and the Heavens. *Current Directions in Psychological Science* 18: 264–68. [\[CrossRef\]](#)
- Keister, Lisa A. 2003. Religion and wealth: The role of religious affiliation and participation in early adult asset accumulation. *Social Forces* 82: 175–207. [\[CrossRef\]](#)
- Leamaster, Reid J., and Anning Hu. 2014. Popular Buddhists: The Relationship between Popular Religious Involvement and Buddhist Identity in Contemporary China. *Sociology of Religion* 75: 234–59. [\[CrossRef\]](#)
- Li, Xiangping. 2017. Private Believe and Average Society—The Pattern of Religious Believe and its Value in Contemporary Chinese. *Academic Monthly* 49: 165–79. [\[CrossRef\]](#)
- Li, Yi, Robert Woodberry, Hexaun Liu, and Guang Guo. 2020. Why are Women More Religious than Men? Do Risk Preferences and Genetic Risk Predispositions Explain the Gender Gap? *Journal for the Scientific Study of Religion* 59: 289–310. [\[CrossRef\]](#)
- Liao, Xianghui. 2019. China: Some Exceptions of Secularization Thesis. *Religions* 10: 56. [\[CrossRef\]](#)
- Liu, Eric Y. 2010. Are Risk-Taking Persons Less Religious? Risk Preference, Religious Affiliation, and Religious Participation in Taiwan. *Journal for the Scientific Study of Religion* 49: 172–78. [\[CrossRef\]](#)
- Mata, Rui, Renato Frey, David Richter, Jürgen Schupp, and Ralph Hertwig. 2018. Risk Preference: A View from Psychology. *Journal of Economic Perspectives* 32: 155–72. [\[CrossRef\]](#)
- Miller, Alan S. 2000. Going to Hell in Asia: The Relationship between Risk and Religion in a Cross Cultural Setting. *Review of Religious Research* 42: 5. [\[CrossRef\]](#)
- Miller, Alan S., and John P. Hoffmann. 1995. Risk and Religion: An Explanation of Gender Differences in Religiosity. *Journal for the Scientific Study of Religion* 34: 63. [\[CrossRef\]](#)
- Miller, Alan S., and Rodney Stark. 2002. Gender and Religiousness: Can Socialization Explanations Be Saved? *American Journal of Sociology* 107: 1399–423. [\[CrossRef\]](#)
- Norris, Pippa, and Ronald Inglehart. 2004. *Sacred and Secular: Religion and Worldwide Politics*. New York: Cambridge University Press.
- Ruan, Rongping, and Linlu Liu. 2012. Reasons for 'Rural Religion Fever': Religion Social Risk Hypothesis. *Journal of South China Agricultural University (Social Science Edition)* 1: 108–16.
- Saka, Paul. 2001. Pascal's Wager and the Many Gods Objection. *Religious Studies* 37: 321–41. [\[CrossRef\]](#)
- Saroglou, Vassilis. 2011. Believing, Bonding, Behaving, and Belonging: The Big Four Religious Dimensions and Cultural Variation. *Journal of Cross-Cultural Psychology* 42: 1320–40. [\[CrossRef\]](#)
- Saroglou, Vassilis, Magali Clobert, Adam B. Cohen, Kathryn A. Johnson, Kevin L. Ladd, Matthieu Van Pachterbeke, Lucia Adamovova, Joanna Blogowska, Pierre-Yves Brandt, Cem Safak Çukur, and et al. 2020. Believing, Bonding, Behaving, and Belonging: The Cognitive, Emotional, Moral, and Social Dimensions of Religiousness across Cultures. *Journal of Cross-Cultural Psychology* 51: 551–75. [\[CrossRef\]](#)

- Stark, Rodney. 1996. Religion as context: Hellfire and delinquency one more time. *Sociology of Religion* 57: 163–73. [[CrossRef](#)]
- Stark, Rodney. 2002. Physiology and Faith: Addressing the “Universal” Gender Difference in Religious Commitment. *Journal for the Scientific Study of Religion* 41: 495–507. [[CrossRef](#)]
- Stark, Rodney. 2017. *Why God?: Explaining Religious Phenomena*. West Conshohocken: Templeton Foundation Press.
- Sullins, Donald Paul. 2006. Gender and Religion: Deconstructing Universality, Constructing Complexity. *American Journal of Sociology* 112: 838–80. [[CrossRef](#)]
- Wainwright, William, ed. 2005. *The Oxford Handbook of Philosophy of Religion*. New York: Oxford University Press.
- Wang, Xiuhua, and Sung Joon Jang. 2018. The Effects of Provincial and Individual Religiosity on Deviance in China: A Multilevel Modeling Test of the Moral Community Thesis. *Religions* 9: 202. [[CrossRef](#)]
- Wei, Dedong, and Eric. Y. Liu. 2013. Religious Involvement and Depression: Evidence for Curvilinear and Stress-Moderating Effects Among Young Women in Rural China: Religious Involvement And Depression. *Journal for the Scientific Study of Religion* 52: 349–67. [[CrossRef](#)]
- Yang, Fenggang. 2006. The Red, Black, and Gray Markets of Religion in China. *The Sociological Quarterly* 47: 93–122. [[CrossRef](#)]
- Yang, Fenggang, and Anning Hu. 2012. Mapping Chinese Folk Religion in Mainland China and Taiwan. *Journal for the Scientific Study of Religion* 51: 505–21. [[CrossRef](#)]
- Zhai, Jiexia Elisa. 2010. Contrasting Trends of Religious Markets in Contemporary Mainland China and in Taiwan. *Journal of Church and State* 52: 94–111. [[CrossRef](#)]
- Zhang, Chunni, and Yunfeng Lu. 2020. The measure of Chinese religions: Denomination-based or deity-based? *Chinese Journal of Sociology* 6: 410–26. [[CrossRef](#)]
- Zhang, Chunni, Qi Cui, and He Sheng. 2022. How did Christianity Rise in Contemporary Chinese Cities? *The World Religious Cultures* 1: 66–73.
- Zhang, Chunni, Yunfeng Lu, and He Sheng. 2021. Exploring Chinese folk religion: Popularity, diffuseness, and diversities. *Chinese Journal of Sociology* 7: 575–92. [[CrossRef](#)]
- Zhang, Guoqi. 2005. The Influence of the “Guan-gong Culture” on the Underworld Crime. *Journal of Guizhou University (Social Science)* 4: 97–100.
- Zheng, Fengtian, Rongping Ruan, and Li Liu. 2010. Risk, social security and religious beliefs. *China Economic Quarterly* 9: 829–50.
- Zhou, Xing. 2017. Folk Belief and Its Legitimization in China. *Western Folklore* 76: 151–65.