

# The Influence Factors and Mechanism of Societal Risk Perception\*

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**Abstract.** Risk perception is one of important subjects in management psychology and cognitive psychology. It is of great value in the theory and practice to investigate the societal hazards that the public cares a lot especially in Socio-economic transition period. A survey including 30 hazards and 6 risk attributes was designed and distributed to about 2, 485 residents of 8 districts, Beijing. The major findings are listed as following: Firstly, a scale of societal risk perception was designed and 2 factors were identified (Dread Risk & Unknown Risk). Secondly, structural equation model was used to analyze the influence factors and mechanism of societal risk perception. Risk preference, government support and social justice could influence societal risk perception directly. Government support fully moderated the relationship between government trust and societal risk perception. Societal risk perception influenced life satisfaction, public policy preferences and social development belief.

**Keywords:** Societal risk perception, psychometric paradigm, Social justice, Government Trust.

## 1 Introduction

The degree of risk individuals assign to societal problems involving possible harm helps shape their attitudes toward public policy on such issues. Extensive literatures explain both the underlying causes of risk perception per se and the determinants of assigning risk to particular activities, situations, or technologies. But relatively few studies account for the influence factors and mechanism of risk perception in social situation. This paper is aim to describe the societal risk perception of the public and to explore the mechanism of it.

### 1.1 The Study of Risk Perceptions

In the late 1970s, stimulated by the merits of Starr's approach, [1] Slovic, Fischhoff, and Liechtenstein [2], [3] carried out studies using questionnaires, asking people

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directly about their perception of risks and benefits of many issues. [2], [3], [4] They characterized the hazards using several attributes that hypothetically influence the perception and acceptance of the associated risks. [1], [5] One of the main characteristic of these studies was the variety of psychometric scaling methods used to produce quantitative measures of perceived risk. [6], [7] The authors refer to this methodology as the “psychometric paradigm,” assuming that what individuals subjectively understand as risk may be influenced by a wide array of psychological, social, institutional, and cultural factors.[8] The paradigm assumes that, with an appropriate design of the survey instrument, many of these factors and their interrelationships can be quantified and modeled in order to better understand individuals’ and society’s attitudes toward the hazards they confront. [8]

The application of the psychometric paradigm by Slovic, Fischhoff, and Liechtenstein represents a landmark for research of public attitudes toward risk.[2], [3], [4] The psychometric method has been utilized for studying risk perception in a number of countries, such as Norway [9], Poland [10], Italy [11], France [12], and Chile [13]. Although risk perception research has a history of more than 40 years in Europe and North America, little is known about risk perception among the Chinese people, who comprise one of the world’s largest ethnic groups. The available data on risk perception among the Chinese mainly come from environment risk situation [14], [15], [16], [17], seldom in social situation. Xie, Xu [18] [19] did a series of researches which are focused on the perceptions among the whole hazards faced to public. Liu, Huang, Zhou [20] explored the construction of public societal risk. We attempt to improve upon prior research on societal risk perceptions among Chinese by addressing current societal hazards that threatened publics.

## 1.2 The Influence Factors and Mechanism of Societal Risk Perception

Understanding the influence factors and mechanism of societal risk perception is important for several reasons. Firstly, establishing whether linkages between risk preference and perceived risk help explain how personal risk preferences effects public’s perception on societal problems. Previous research on the relationship between personality and risk perception are inconsistent. Some research found risk preference could influence public’s risk perception [3], [8], [21], while others did not prove it [19]. We will explore this in social situation of current China.

Secondly, establishing whether government trust and support that they get from government contribute to societal risk perception helps explain how the public views governmental management of social hazards. As Gerber and Neeley [22] said, Studies of risk perceptions and policy issues often proceed by identifying a potential hazard highly salient to the public (such as nuclear energy) and then examining the underlying determinants of how the public assesses the degree of safety/risk associated with that activity or technology [23], [24], [25], [26]. Seldom research focused on the social issue. So our study will pay more attention to the relationship between public’s attitude on government and their risk perception. The first variable we cared about is trust in government. Pollak [27] argues that because of meaningful constraints on scientific knowledge of risk and because the public frequently lacks trust in government and in experts, public policies pertaining to risk should create institutional arrangements that promote public confidence in the efficacy of policy

responses to various hazards. Ample evidence points to government trust as critical to individuals' risk rating of various hazards which have policy implications [28], [29], [30], [31]. The second variable we cared about is government support. Consistent with the cushion hypothesis, Chinese individuals perceive financial options as less risky than Americans [32], because they have better support system. So we suppose that if public could get more supports from government when they face to the hazards, then their risk perception will descend.

Thirdly, establishing whether social justice influence public perception on societal risk helps explain how the public views social situation affects their perception of risk. Lerner and Miller argued that the more personal an experience of injustice, the more threatening that they felt [33], [34]. So we suppose that social justice is an indicator of public's attitude of current socio-economic transition in China.

Accounting for how societal risk perception affect public's attitude on current life and future could illuminates the meaning of societal risk perception research. Gerber and Neeley[22] find that citizens utilize perceived risk rationally: greater perceived risk generally produces support for more proactive government to manage potential hazards. A problem will be worse in the future affects the degree of perceived risk associated with that issue [23], [3]. Hence, we suppose that perceived risk not only produce the attitude of current, but also could influence public's view on the future belief. Prior research shows that an individual's belief.

In a word, the present work aims to describe risk perception in P. R. China using the psychometric paradigm and to explore the influence factors and mechanism of risk perception, while trying to fill in some of the knowledge gaps that currently exist on some issues. Its goals are: (1) to assess what hazards preoccupy Chinese; (2) to describe those attributes of risk that influence the population's perception of them; (3) to explore the influence factors and mechanism of risk perception.

## 2 Method

### 2.1 Sample

A total of 2485 people participated in the study (43% males and 57% females). Their ages ranged from 18 to 83 years (median=36.3) and they were all come from Beijing. In general, the sample is in line with the region's population characteristics.

### 2.2 Materials

*Societal Risk Perception:* To achieve the research goals, a survey was developed based on the work of Slovic [8] and colleagues in which subjects were required to quantify 6 attributes for 30 hazards which divided into 7 groups. The hazards were extracted from panel study and adapted to the P. R. China situation.

*Risk Preference:* We measure risk preference by asking "Compare to others, my personality is" (Six-point response scale ranging from "very risk aversion" to "very risk taking").

*Government Trust:* the measure of this variable is a replication of that adopted by Brian, Gerber and Grant [22]. "In general, how much of the time do you trust the

national government to do what’s right? In general, how often do you trust your city government to do what’s right? (Six-point response scale ranging from “Just about always” to “Almost never”)

*Government Support:* to examine government support, we manipulated this construct by asking “when I meet hazards, government could support my life” (Five-point response scale ranging from “strongly disagree” to “strongly agree”).

*Social Justice:* social justice questionnaire was included comprising the six items of the General Belief in a Just World Scale [35] and the seven items of the Personal Belief in a Just World Scale [35] in random order.

*Social Development Belief:* We administered a measure of social development belief by attracting 6-item from the social survey which developed by ISR (Institute for Social Research, University of Michigan).

*Policy Response Preferences:* The item of this survey was taken from previous work of Brian, Gerber and Grant [22]. We measure this construct by asking “Government should take stronger steps in such 7 kind of problems, even if it means more disturbing to citizens” (Five-point response scale ranging from “strongly disagree” to “strongly agree”).

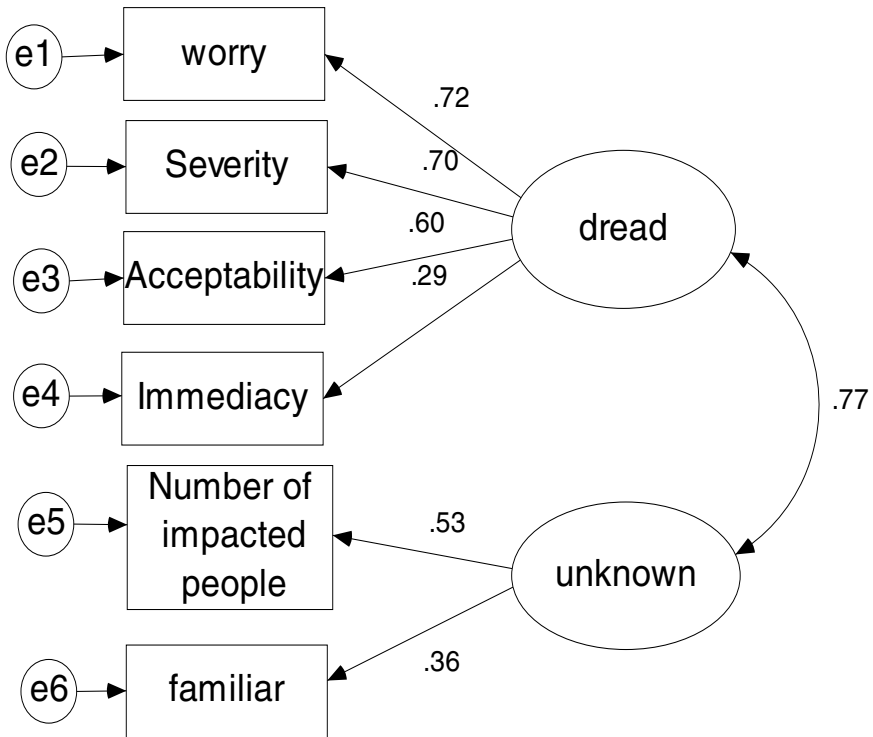


Fig. 1. The CFA result of societal risk

### 3 Result

#### 3.1 Perceived Societal Risks

In the panel study, a principal component analysis of sample was conducted, and a varimax rotation was performed. We got 2 factors from 6 attributes, which is Dread Risk & Unknown Risk. As the Fig.1 shows, we confirm this construct by using CFA (Confirmatory factor analysis) in the formal survey and the model fit well ( $\chi^2=159.5$ , GFI=0.98, AGFI=0.95, CFI=0.93, RMSEA=0.09). The factor “dread” includes worry, severity, acceptability, and immediacy; while factor “unknown” include number of impacted people and familiar.

By using factor scores of “dread risk” and “unknown” as coordinates, Fig. 2 presents a two-dimensional plot of societal risk. Results indicate that the Daily life hazards have highest loadings on the factors dread & unknown. This result explain that the daily life hazards which include *price arising, children education, food and*

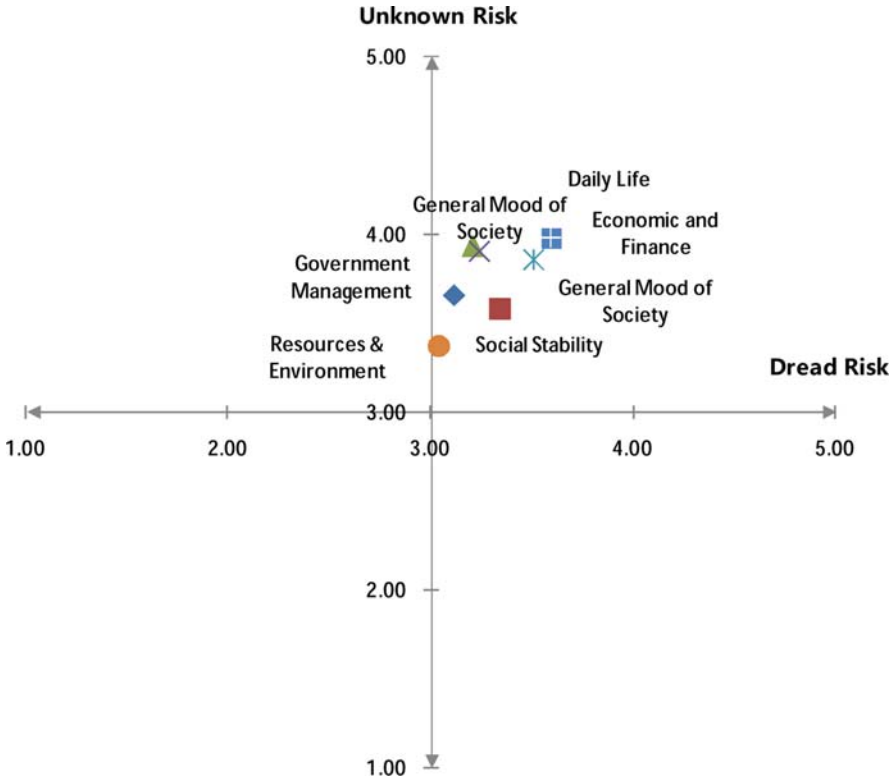


Fig. 2. Location of the societal hazards within the two-component space

medicine safety, unemployment, medical insurance, traffic problems and so on are main problems threatened the public.

### 3.2 The Influence Factors and Mechanism of Societal Risk Perception

To estimate the structural equation modeling (SEM) we use the Amos 7 program with full information maximum likelihood estimation that allows cases with missing data to be retained, instead of deleting those cases through a pairwise or listwise technique. Using the gathered survey data, we estimated our 2 models. Model 1 assumed that: the risk preference, social justice, government trust, government support will directly influence the public’s societal risk perception; government support will partially moderate the relationship between government trust and societal risk perception; societal risk perception will affect social development belief, life satisfaction and policy response preference. Model 2, as Fig. 3 shows, assumed that government support will fully moderate the relationship between government trust and societal risk perception.

The model 1 testing the mechanism of perceived societal risk revealed a good fit to the data. GFI, AGFI, CFI, NFI, IFI, TLI, and CFI were all above the recommended level of .90, the RMSEA was .06, below the recommended .08 for a good model. The second model also presented a good fit to the data. GFI, AGFI, CFI, NFI, IFI, TLI, and CFI were all well above .90 and the RMSEA was .06. However, the directly relationship between government trust and societal risk perception is not significant in model 1, so model 2 accounts best for the data.

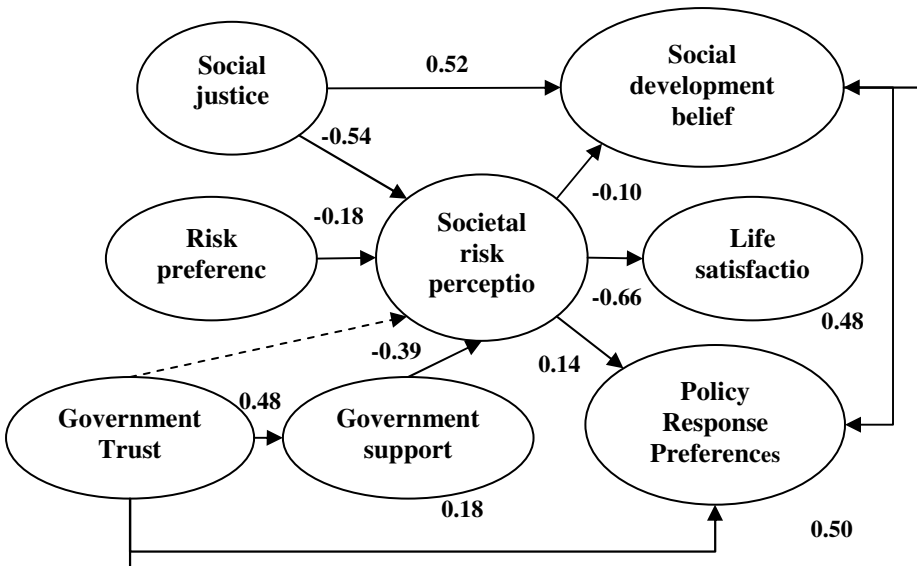


Fig. 3. Structural Model of Policy Response Preferences

**Table 1.** Perceived Risks (Mean and Standard Deviation) of the Public

	$\chi^2$	df	$\chi^2/df$	GFI	AGFI	NFI	IFI	TLI	CFI	RMSEA
Model1	2251.18	240	9.38	0.93	0.91	0.92	0.93	0.92	0.93	0.06(0.06-0.06)
Model2	2204.24	220	10.02	0.93	0.91	0.92	0.93	0.92	0.93	0.06(0.06-0.06)

## 4 Discussion

### 4.1 Societal Risk in P. R. China

Using similar qualitative risk attributes to those in previous studies, we obtained similar factors of Slovic [8] previous research, with little differences in their composition. We believe that this attribute composition is better represents the societal risk in China.

In sum, findings of the current study suggest that Chinese tend to perceive societal hazards as moderately threatening. Regarding hazards, the most striking differences between the current samples and those studied in prior research is the focused point of hazards. Daily life problems are perceived more dreadful in our research. 2002, Xie found in her study that compare to the result of 1994, public pay more attention to the macroscopically problems which come down to whole of social development. However, just as Boholm said actions and understandings about risks are learned by socially and culturally structured conceptions and evaluations of the world [36]. In our current results, public turned around to concern the daily life problems, such as price rising of commodity & house. The high sensitivity to daily life problem may have its origin in the social setting of current Beijing, and in the socioeconomic characteristics of its population. The result told that some public issues around daily life can now capture the preoccupation of current China.

### 4.2 The Influence Factors and Mechanism of Societal Risk Perception

In current study, we found that the risk preference, social justice, government support will directly influence the public's societal risk perception; government support will fully moderate the relationship between government trust and societal risk perception; societal risk perception will affect social development belief, life satisfaction and policy response preference.

There is general consensus that trust is important in risk management. However, the effects of trust vary strongly across studies. Up to 70% [37] of the variance of risks perceived could be explained using trust as a predictor. In most studies the correlation between the risks perceived and trust were in the range between 0.2 and 0.4. [31] We think this inconsistent result may due to the moderation effect of the government support. In current research, we found that government trust could not affect risk perception directly. This result said that trust and act are both important to government. Trust in government could work only when public believe they can get government support when they face to hazards.

The personal belief in a just world is important in predicting the appraisal of societal risk. Just as Confucius said, the lord of a state or a family concerns himself

not with scarcity, but rather with uneven distribution. In view of the fact that our country locates special historical development stage, the social justice question has already been an urgent social question to overcome.

Societal risk perception like a weatherglass could explain the attitude of public. On the one hand, it could influence the comment on current social. Risk social theory [38] believes that macroscopically risk could transform to microscopically risk in a way. That's mean the hazards of social may affect every ordinary people's life. Meanwhile, microscopically risk could transform to macroscopically risk too, if ordinary people feel that the hazards had already threaten daily life, they will support government manage them. On the other hand, societal risk could affect the comment on future belief. This result could let us view the societal risk perception as forecast social indicator, for the high sensitivity to future appraisalment.

By describing the societal risk and examining the structured model, we can account for the influence factors and mechanism of societal risk. Recognition of both direct and indirect effects through the modeling of exogenous and endogenous relationships improves the ability to capture the myriad determinants of the citizenry's perspective on hazard management.

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