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Particulate matters: How trust and media use impact risk perceptions of air pollution in Beijing

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Particulate matters:

How trust and media use impact risk perceptions of air pollution in Beijing

by

Yue Qiu

A thesis submitted to the graduate faculty

in partial fulfillment of the requirements for the degree of

MASTER OF SCIENCE

Major: Journalism and Mass Communication

Program of Study Committee:
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DEDICATION

I would like to thank my major professor, Dr. Michael Dahlstrom, and my committee members, Dr. Gang Han, and Dr. Michelle Soupir, for their guidance and support throughout the course of this research.

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ABSTRACT

Trust is an important factor within the formation of risk perceptions, but is easily broken and difficult to rebuild. This study seeks to determine the long-term influence of a trust-breaking event with regard to an environmental risk. Specifically, this study explores how people in Beijing perceive the risk of PM2.5 air pollution and which sources they now use and trust for this information two years after the official media was criticized for not being trustworthy in its dissemination. Results find that respondents perceived PM2.5 air pollution as a significant threat across nine risk dimensions and that social media were most often used to obtain risk messages regarding PM2.5 air pollution. Relationships regarding trust were weak. More trusted sources were expected to be used more often for PM2.5 information, but this relationship was only found for interpersonal sources. Likewise, trust was expected to be related to risk perceptions, but was related with only a handful of risk factors, none of which were consistent across sources. Individuals more impacted by the trust-breaking event were expected to also exhibit less change of trust over time, but this was not found. This general lack of trust relationships may be due to an invalid measure of trust caused by fear of repercussion for criticizing governmental channels in an online survey.

CHAPTER I

INTRODUCTION AND PROBLEM STATEMENT

The process by which various publics interpret and evaluate risk information is complex and often result in diverse perceptions and judgments about the same risk information. The psychometric paradigm identifies many risk factors that influence perceptions about a risk, such as emotional dread, controllability and blame (Fischhoff, Slovic, Lichtenstein, Read, Combs, 1978). Whereas the publics' risk perceptions often involve these subjective values, experts involved in the risk calculations often perceive the risks quite differently – focusing risk judgments primarily on the severity of the potential risk and its probability (Sterman, 2008). This difference between how experts and lay publics evaluate risks often result in what experts see as irrational or misguided risk judgments.

Risks can also influence the reliance individuals place on sources of risk information. Shepherd and Kay (2012) claim that increased uncertainty toward risks bring psychological discomfort, which often increase the reliance publics place in authorized information sources, such as on the government or experts. They established a model illustrating how perceived lack of knowledge can result in justification of the existing system through (1) increased feelings of dependence on the government, (2) increased trust in the government and overall system support, and (3) decreased desire to learn more about the issue if information is negative or uncertain (Shepherd & Kay, 2012).

However, an additional factor that plays a significant role in risk perception is trust. Trust is one of the most indispensable elements in risk communication, especially for affecting perception, attitudes and also managing the relationship between different sources and publics.

Siegrist and Cvetkovich (2000) describe that trust will be significantly related to judgments of risks and benefits, especially about hazards where the public has little previous knowledge. Trust not only affects the perception of risk, but also influences the sources audiences will seek out, as individuals are more likely to follow instructions given by someone they trust (Shore, 2003). Yet, a perceived betrayal of trust hinders acceptance of information, and can be very difficult to repair. Slovic (1993) claims the process of creating trust is very slow and can easily be destroyed, sometimes by a single event. In addition, media plays an important role in forming trust, as well as breaking it, which are affected through the responses of public (Frewer, 2003).

In particular, environmental risks may be especially susceptible to trust effects. Liu, Xie and She (2014) note that individuals are often apathetic to environmental risks at first, but can become strongly worried as the risk continues, which they note can be harmful to both individual and social well-being. There is also less ability for individuals to evaluate large scale environmental risks from their own direct experiences, so is unlikely that publics will be fully aware of all of the components of a particular environmental risk. As a result, environmental risk perceptions inherently depend on trust (Johnson & Scicchitano, 2000).

To explore the lasting importance of trust on environmental risk perceptions, this study is interested in exploring the “echo” of a trust-breaking event on the perception of a risk years after an environmental risk event. Because environmental risk perceptions are often more tied to social evaluations of trustworthiness than direct experience, and trust is difficult to regain once it is lost, we would expect an initial trust-breaking event to have lingering repercussions on public perceptions even if those responsible rescind and work to realign their message afterwards.

An ideal context to explore this phenomenon is from the 2012-2013 public communications between China and the US embassy in Beijing regarding the risks of air

pollution in Beijing. While people in Beijing were aware of the problem of air pollution in the city before late 2012, they were generally not concerned with air pollution particles with aerodynamic diameters less than 2.5 micrometers, often referred to as PM2.5. These particles are particularly dangerous for human health and are not filtered by normal air purification methods. The Chinese government had been publishing general air-quality readings every hour for years, but the US embassy in Beijing began to measure and disseminate PM2.5 levels on a daily basis in 2009, and their data showed the air quality to be much more harmful compared to the official government reports. Chinese officials in Beijing worried that conflicting information between their official reports and those from the US embassy could cause suspicion within the Chinese public (Page, 2012) and denied the U.S. data, announcing in the state controlled traditional media that the U.S embassy had a different and illegal evaluating system for PM.

However, in late 2012 and early 2013, a group of celebrity Chinese Twitter-Weibo users used social media to begin a public outcry against the Chinese government for not telling the truth about Beijing air quality and covering up the risks faced by people in Beijing. This outcry coalesced over the next few months into a public drive for reforms to air pollution policy. Zhao (2013) noted that the numbers of comments on Weibo relative to “Beijing PM2.5” increased prominently in early January 2013, with nearly 50% of the comments between negative to very negative on the issue (Van de Ven, 2014). After this trust-breaking event, people in Beijing were skeptical about the official data from their own government monitoring stations (Liu, 2012) and were more likely to check the PM2.5 data from the US Embassy site.

Now that two years have passed, what are the lingering effects of this risk event that tarnished the trust in one expert source of risk information? And how do the different roles of the media platforms that provide this information intersect with such trust? To explore these

questions, this study examines the effects of this trust echo on current perceptions of air quality risks and trust in sources. Because the break in trust was most prominent for Beijing social media users in 2012-2013, this study surveyed Beijing social media users in 2015 to determine current perceptions. This study provides a longer-term assessment of the importance of trust on how publics formulate risk perceptions. The findings may also be useful to sources or organizations that strive to maintain trust with their publics or that need to rebuild trust after a trust-breaking event of their own.

CHAPTER 2

LITERATURE REVIEW

Risk Perceptions

Risk perceptions are not comprised merely of objective frequencies and severities of a phenomenon, but also a range of individualized subjective factors (Slovic, 1992a).

Understanding how risk perceptions are formed involve a synthesis of psychological, environmental, socio-cultural and political factors (Slovic, 1992b). The psychometric paradigm was developed as one framework to explain how risk perceptions are formed (Slovic, 1992b).

The psychometric paradigm states that individuals assess risks based on a combination of calculated probability and severity, as well as a suite of subjective factors, including the degree to which risk is understood, emotional dread, anger, controllability and self-efficacy. Risk perceptions also differ based on whether the risk poses a hazard to the self or to society in general. Individual risks that threaten the self are generally perceived as more severe and are more likely to cause behavioral action to address the risk while societal risk is seen as more diffuse, is harder to comprehend and results in less action and attitude change (Morton & Duck, 2001).

The psychometric paradigm has been used to explore how individuals construct perceptions about various environmental risks. For instance, McDaniels, Axelrod & Slovic (1995) applied the psychometric paradigm to environmental risk perceptions in general and found that perceived impact on species, human benefits, and impact on humans were strongly involved with perceptions of environmental risks. Likewise, Lazo, Kinnell, & Fisher (2000) explored climate change risk perceptions using the McDaniels et. al (1995) psychometric scales and found that

perceived impact, avoidability, acceptability, and understandability were all significantly correlated with ratings of climate change risks. Lai & Tao (2003) investigated 25 general environmental risks in Hong Kong and Willis (2002) explored factors such as acceptability of current risk levels and strictness of current regulations -- both studies identified specific factors in the construction of their perceived risks. Beyond these subjective factors, risk perceptions also tend to align with demographic factors as well. Engel and Potschke (1998) found that age and education influenced the construction of risk perceptions and Blocker and Eckberg (1997) found that gender and social status also have important effects, with women from a higher social status being the most concerned about environmental risks.

Moving specifically to perceived risks of air pollution, Saksena (2007) notes that few studies have focused on the risk perceptions of urban air pollution. Saksena describes that the earliest studies about risk perceptions of air pollution came from the 1950s and 1960s but only focused on the level of awareness as a factor. Since the middle of the 1990s, some research did begin to explore how political and cultural factors influenced the perceptions, mainly through qualitative methods. Saksena (2007) describes another focus that examined risk perceptions of air pollution through the lens of improving official risk communication. These studies attempted to find a relationship between public perceptions and government actions (such as mitigation or pollution data gathering). McDonald, Hession, Rickard, Nieuwenhuijsen & Kendall (2012) found that individuals that were more informed were also more likely to construct risk perceptions about air pollution that included a wider range of information, such as scientific information, emotional factors and economic factors, than individuals who were less informed.

Within the context of China, however, there have been few studies on environmental risk perceptions (Lai & Tao, 2003) and even fewer about air pollution in particular, as public opinion

surveys in China pay more attention to general environmental issues such as environmental protection and energy consumption rather than about specific environmental risk issues (Zhao, 2013). The few studies that do exist explore individual's environmental behavior and awareness and are far from conclusive. Peng & Zhou (2001) found that Chinese residents with high education levels have less severe perceptions of water pollution, environmental sanitation, and noise pollution while Wang & Hou (2010) found that young citizens with higher educational background had greater awareness of environmental protection and greater willingness to engage in environmentally protective behaviors.

Because very little research exists on how people in Beijing construct environmental risk perceptions, especially within an air pollution context, one of the objectives of this study is to provide one of the first empirical measures of what factors Chinese audiences use to construct risk perceptions regarding air pollution.

The Importance of Trust

Yet another important factor related to risk perceptions is trust. In fact, some scholars argue that trust is one of most significant variables upon the formation of risk perceptions. Slovic (1993) noted that, "trust is more fundamental to conflict than is risk communication" (p. 677). The research also noted that trust could be destroyed very easily and quickly even by a very small mistake, and attempting to regain trust once lost takes a long time, if it is to be rebuilt at all. Thus, communicators should not consider risk communication as merely a matter of informing public about the risk but as also an activity of trust building. In addition, the relationship is reciprocal -- individuals are more likely to seek out and accept risk information from trusted sources and at the same time, effective and appropriate communication of risk can

build trust with audiences. Within trusted relationships, people are more willing to follow an institution's policy or management strategies regarding specific risks (Trettin & Musham, 2000).

Previous research has explored different dimensions associated with the creation of trust in risk communications (Poortinga & Pidgeon, 2003). Kasperson, Golding & Tuler (1992) considered trust as "a person's expectation that other persons and institutions in a social relationship can be relied upon to act in ways that are competent, predictable, and caring" (p. 169) and cited four dimensions as essential to the creation or destruction of trust: commitment, competence, caring, and predictability. Similarly, Renn & Levine (1991) defined trust as "the generalized expectancy that a message received is true and reliable and that the communicator demonstrates competence and honesty by conveying accurate, objective, and complete information" (p. 53) and offered five dimensions of trust: competence, objective, fairness, faith and consistency.

Meijboom and colleagues introduced two types of trust, anticipatory trust and responsive trust (Meijboom, Visak & Brom, 2006). Anticipatory trust describes trust offered because the individual expects the other to uphold promises following the past experience. Responsive trust describes trust offered because the individual feels an obligation to respond to the other's trustworthy actions, which doesn't require any previous experience from the trustee (Meijboom, Visak & Brom, 2006).

These various conceptions of trust have been used to explore the formation of risk perceptions. For instance, Poortinga & Pidgeon (2003) analyzed the relationship of trust elements toward risk regulation in five social risk issues: climate change, radiation from mobile phones, radioactive waste, genetically modified food, and human genetic testing. Results indicated patterns based on two major factor groups. The first combined aspects such as

competence, care, fairness, and openness, while the second consisted of aspects such as credibility, reliability, and integrity. Poortinga & Pidgeon (2003) found that people with high ratings in both factors trust the sources greatly. If people have high ratings in the first, but are skeptical of the second, people still accept the risk information, but also question its accuracy. People with low ratings of each develop distrust, rejecting information from the source.

This finding that greater trust leads to more acceptance of risk information and thus incorporation into resultant risk perceptions is mirrored through the literature. Siegrist (2000) explored relationships among trust, benefits and risk perception of gene technology and genetically modified products and found that trust had a positive influence on perceived benefits and a negative influence on perceived risks. Siegrist and Cvetkovich (2000) explored relationships between trust, level of knowledge and risk perceptions and found stronger positive relationships between trust and risk perceptions associated people who felt they were lacking in knowledge about risks.

Since media are important sources for information, the trust placed in the channel of information often overlays the trust placed in the source of the information itself (McQuail, 2005). In order to measure trust in media content, Meyer (1988) created the Meyer's Credibility Index consisting of five items: whether the source of the information is perceived to be fair, unbiased, telling the completed story, accurate and can be trusted. The credibility index has good reliability and has been found to have high validity within environmental and health risk contexts (McComas & Trumbo, 2001).

While trust is important for risk perceptions, evidence shows trust is hard to build and easy to destroy. Mejiboom, Visak & Brom (2006) examined the role of trust in the food sector and found that while it was difficult for a brand to build its reputation in the market, it only took

one accident to cause consumers to lose confidence in the quality of the brand. A similar case occurred in Ontario where contaminated drinking water in the city of Walkerton caused some residents to fall ill and resulted in seven deaths. In consequence, trust in the regional and provincial governments dropped significantly and many people turned to bottled water for drinking (Burley, 2005).

One of the most public cases of a trust-breaking event was “climategate,” the unauthorized release of many UK and US climate scientists’ emails, some of which showed internal questioning of data. Even though scientists are often perceived as trustworthy sources within climate change contexts, a national representative survey found trust in climate scientists and climate change in general dropped significantly among the American public after this event (Leiserowitz, Maibach, Roser-Renouf, Smith & Dawson, 2012).

Once trust has been lost, regaining it is difficult. Tsang, Burnett, Hills & Welford (2009) explored the relationship between trust, public participation and environmental governance in Hong Kong where the private sector and general public are often in disagreement on many environmental issues. The research found deliberation could rebuild trust by producing familiarity and helping to identify shared values, but in doing so, the government needs to be willing to share power in the decision-making processes. Similarly, Kasperson (2011) explored how the management of nuclear waste resulted in the erosion of public trust and confidence. He suggests that the process of rebuilding trust requires consistent efforts in all aspects of organizational policy-making through transparent, participatory procedures. He notes that these actions do not guarantee success, but ignoring them increases the chances of repeating past failures.

In sum, while trust is crucial for risk communications, it is fragile and can be lost in a single, trust-breaking event. Likewise, the difficulty in repairing trust suggests there would exist a lingering effect of distrust over time even as the organization attempts to repair its relationships. We call this a metaphorical “trust echo”. Within a Chinese context, there is a historical example of such a break in trust surrounding air pollution in Beijing that would allow the study of any effects from such a trust echo.

The Case of PM2.5 in Beijing

In order to ensure the quality of air during the 2008 Olympic Games in Beijing, the government employed the international air evaluating system to monitor air quality and released summary readings to the public hourly. Particulate matter in general (PM) represents a measure of the density of small particles suspended in the air (Grahame & Schlesinger, 2012). PM2.5 specifically represents the suspended particles that are smaller than 2.5 micrometers in diameter, which are singled out because they are particularly harmful, causing multiple diseases and even some types of cancer (WHO, 2014). People in Beijing were able to assess the density of PM from the official air quality report, but were not able to assess the density of PM2.5 as the Beijing official government never explained the difference nor added measures of PM2.5 into their air quality monitoring program.

In contrast, the U.S. embassy in Beijing started measuring and releasing readings of PM2.5 in 2009 and declared that these particles are so poisonous to health that people should take action to protect themselves or stay away from the polluted regions. The U.S. embassy also claimed that action should be taken to reduce the level of PM2.5 in the air, but officers of the Beijing government did not respond.

The Beijing government did not agree with the PM2.5 data published by the U.S. embassy and worried it may lead to confusion within the public. In response, the Beijing Environmental Monitoring Centre indicated that special labels, such as “above 500”, should be used to describe the PM2.5 levels rather than providing specific measurements (Wagner, 2014). In order to control the release of such information, the government closed channels for some websites to prevent people from getting access.

Zhao (2013) stated the rapid speed of news communication has increased with the development of social media. Social media and the Internet give people the freedom to access more information about things in which they are concerned. In this context, this new speed and freedom led to a public outcry (Zhao, 2013). There are several types of social media in China, one of which is Weibo. Weibo has been called a Chinese combination of Twitter and Facebook (Cao, 2012) and is used by 48.7% of Chinese net users (Wan & Ma, 2012). Weibo is an influential news and information source and Chinese political candidates also regularly use Weibo to communicate political messages (Liu & Pascual-Ferra, 2012). In contrast to the state-controlled traditional media, individuals are able to talk and comment freely on Weibo, and Chinese bloggers embrace the increased freedom of speech and use the platform to publish sensitive content and to satirize politics (Tang, 2009). Therefore, these blogs have become part of the popular culture (Ma, 2000), and He (2005) found that blogs are deemed the freest medium and thus viewed by audiences as an alternative to the rigid and censored traditional media. He (2005) also notes that audiences take blogs as a serious source of information, partly because they think the information on the blogs is not censored as much as the traditional media, even though blog writers often self-censor their information to avoid retribution from the government.

In the PM2.5 context, a group of celebrity Chinese Twitter-Weibo users used social media to begin a public outcry against the Chinese government for not telling the truth about Beijing air quality and covering up the risks faced by people in Beijing. Pan Shiyi, chairman of Soho China, was a well-known opinion leader within Weibo who first attempted to conduct a Weibo campaign to pressure Beijing municipal government to release data of PM2.5 in late 2011 (Page, 2012). Other opinion leaders soon followed. Children's author Zheng Yuanjie and the investor Xue Manzi retweeted accusatory tweets from the @Beijingair Twitter stream to Weibo and conducted online polls, inviting Weibo users to comment on the air quality in Beijing (Van de Ven, 2014). Almost 55,000 Weibo users participated, with 89% upset that Beijing air quality was getting increasingly worse.

The government worried about these opinion leaders actively affecting public opinion and the posts were quickly deleted or blocked by Weibo supervisors and the authors punished. Xue Manzi is now in prison and Pan Shiyi was subjected to an interview by officials, where his Weibo polls were cited as "irresponsible social media usage." Zhao (2013) conducted a content analysis of social media posts during this time and noted that the numbers of comments on Weibo relative to "Beijing PM2.5" increased prominently in early January 2013, with nearly 50% of the comments negative or very negative about the issue (Van de Ven, 2014) including fears about death or desires to leave Beijing because of the risk (Zhao, 2013). People in Beijing became skeptical about the official data from their own government monitoring stations (Liu, 2012) and became more likely to check the PM2.5 data from the US Embassy site.

Therefore, PM2.5 is a relatively new risk for people in Beijing, and their emerging risk judgments appear to have been formed during a period where communication channels and sources were aligned with increased or decreased levels of trust. Since this trust-breaking event,

the Chinese government has reversed course and started noting the dangers associated with PM2.5. The deputy mayor of Beijing announced a target of decreasing PM2.5 by 25% in the next five years based on the above issues (China Dialogue, 2013). However, what remains unknown is if such actions can repair the damage caused by a break of trust within a risk perception context.

Study Objectives

This study aims to explore what factors Chinese audiences use to construct their risk perceptions of air pollution and the long-term influence of a trust-breaking event with regard to these environmental perceptions. Specifically, this study explores how people in Beijing perceive their air quality and which sources they now use and trust for this information two years after the official media was criticized for not being trustworthy in its dissemination.

While risk perceptions related to air pollution have been measured in the U.S. There is much less information about Chinese risk perceptions. Therefore, the following research questions seek to measure what factors people in Beijing currently use to perceive the risks related to air pollution.

RQ1. How do people in Beijing perceive the risks of PM2.5 air pollution?

Much of the controversy surrounding PM2.5 came from contrasting risk messages between the traditional media on one side and the US Embassy and social media on the other. While the differences in content are well documented, the frequency with which people were exposed to these contrasting messages is unknown. Therefore, the following research question seek to provide a measure of media use, exploring which media outlets were used most frequently to receive risk messages regarding both PM2.5 air pollution.

RQ2. From which media sources do people in Beijing get risk messages regarding PM2.5 air pollution?

Social media platforms in China are often viewed with greater trust generally due to the censorship present in the government-controlled, traditional media. Likewise, trust in the official government air quality reports was likely weakened for some audiences during the social media controversy where the government was seen to downplay the risks of PM2.5. Therefore, the following hypotheses measures relationships among current trust of media sources and their risk perceptions.

H1. Trust in media sources will be positively associated with increased use of those sources regarding risk messages about PM2.5.

H2. Trust in traditional media sources will be associated with less severe risk perceptions regarding PM2.5.

H3. Trust in social media sources and the U.S. Embassy will be associated with more severe risk perceptions regarding PM2.5.

One unique contribution of this study is the exploration of a trust echo, or the lingering effects of a trust-breaking event years after its alleged offender has tried to improve its perceived trustworthiness. Chinese people were skeptical about the official data from their own government monitoring stations after the event after 2012 (Ma & Chen, 2014). It is also unknown whether the sources people in Beijing now use and trust for this information and how they perceive the risk of PM2.5 air pollution has changed since then. It is likely that individuals who were most critical of the government at the time of the controversy, representing those who experienced the largest loss of trust, will exhibit less trust in traditional media sources now and

will exhibit less improvement in trust over time compared to individuals who were less critical of the government at the time. Therefore, the final hypotheses explore these residual impacts.

H4. Individuals who were more critical of the government at the time of the controversy will exhibit less trust in traditional media and more trust in social media today.

H5. Individuals who were more critical of the government at the time of the controversy will exhibit less change in trust toward the traditional media since the controversy.

CHAPTER 3

METHODS

Sample and data collection

Data was collected through a survey of university students in Beijing. University students were targeted because they are more active users of social media and likely experienced the controversy on Weibo in 2012. Snowball sampling was used to recruit respondents. A professor from the Beijing Institute of Technology first identified 53 students in two classes who were asked to participate and to provide at least two other relevant individuals who might be interested. These suggested individuals were then contacted and this process continued. To encourage participation, the names of those who returned a completed questionnaire were entered in a drawing for a chance to win cash prize.

The survey began in June 2015 and ended in July 2015. The total number of respondents was 167, however the population was bimodal with the majority representing respondents of the age of university students and a second population clustering around the age of the students' parents. Therefore, the respondents of university student age were retained (18-25) and the older respondents were removed from analysis. This retained 79% of the sample and resulted in a final sample of 132 of which 31.8% was male and an average age of 22.14.

Perceived risk

Perceived risk of PM2.5 was measured across nine items capturing risk dimensions from the psychometric paradigm (Fischhoff et al., 1978). Each statement was measured on a Likert scale from 1 (strongly disagree) to 5 (strongly agree). (1) PM2.5 in Beijing represents a serious risk for human health ($M = 4.64$, $SD = 0.48$), (2) the risks surrounding PM2.5 in Beijing are well

understood by experts ($M = 4.16$, $SD = 0.69$), (3) I feel I understand the risks surrounding PM2.5 ($M = 3.36$, $SD = 0.62$), (4) I worry a lot about PM2.5 ($M = 4.44$, $SD = 0.51$), (5) I am angry about the problems of PM2.5 in Beijing ($M = 4.33$, $SD = 0.53$), (6) PM2.5 in Beijing represents a serious risk for myself or my family ($M = 4.11$, $SD = 0.49$), (7) the government could reduce PM2.5 if it wanted to ($M = 4.02$, $SD = 0.87$), (8) individual citizens can do things to protect themselves from PM2.5 ($M = 3.70$, $SD = 0.74$) and (9) I engage in specific behaviors to protect myself from these PM2.5 ($M = 3.78$, $SD = 0.67$). Although these nine items all represent factors of risk perceptions, they capture different dimensions. Reliability analysis confirms that no combination of these items into a scale results in acceptable reliability measures ($\alpha < .6$). As such, these factors were treated as nine individual factors.

Sources

PM2.5 sources were captured by asking about five potential sources of risk information about PM2.5 air pollution: (1) “How often do you get information about PM2.5 from the following sources?” on a scale from 1 (never) to 5 (very often). (1) Traditional Media (Air Quality Index) ($M = 1.36$, $SD = 0.58$), (2) Social Media (Weibo/RenRen/Wechat) ($M = 4.23$, $SD = 0.70$), (3) the US Embassy ($M = 1.89$, $SD = 0.96$), (4) talking to friends and family ($M = 2.52$, $SD = 1.20$) and (5) other ($M = 1.53$, $SD = 0.75$).

Trust in sources was captured by asking respondents to rate each of the previous five possible sources of risk information on the five-item Meyer’s credibility index (McComas & Trumbo, 2001). The index consists of five items and asks whether the source of the information is perceived to be (1) fair, (2) unbiased, (3) tells the complete story, (4) accurate and (5) can be trusted, each on a 1 to 5 scale where greater values represent greater agreement. Normally, this set of five items is combined to arrive at a credibility score for each source. However, reliability

tests revealed that combining these factors were only appropriate for traditional media – for all other sources the reliabilities were surprisingly low ($\alpha = .2$ to $.4$). Therefore, the item most theoretically relevant, can be trusted, was the only one used in further analyses. Specifically, the perception that a source could be trusted varied across the sources of (1) traditional media (Air Quality Index) ($M = 2.77$, $SD = 0.73$), (2) social Media (Weibo/RenRen/ Wechat) ($M = 3.24$, $SD = 0.67$), (3) the US Embassy ($M = 3.53$, $SD = 0.64$) and (4) talking to friends and family ($M = 3.81$, $SD = 0.67$). The fifth source of “other” was omitted for this measure, as it was too vague to be interpretable.

Change over time

Knowledge of controversy was measured by first noting that “In late 2012 and early 2013, there was a controversy when the official air quality index was much more positive than the air quality measures released from the US Embassy in Beijing. Some people on social media criticized the government claiming it was hiding the dangers of PM2.5 air pollution from the people of Beijing,” and then asking with a yes / no question if they remembered this controversy. If the answer was no, the survey was designed to skip the following measures and move to the final demographic questions. However, all the respondents reported remembering this event and so all respondents also were measured on the following factors.

Governmental fault represents the degree to which respondents agreed with the criticisms of the government during the controversy in 2012-2013 and was measured by asking, “How much do you agree with the social media groups that at that time [of the controversy] that the government was untrustworthy?” on a scale from 1 (strongly disagree) to 5 (strongly agree) ($M = 3.97$, $SD = 0.72$).

Change in trust was captured by asking on a scale from 1 (Strongly disagree) to 5 (Strongly agree): My trust in air pollution information from [insert source here] has increased since 2013. The sources asked about were (1) Traditional Media (Air Quality Index) ($M = 1.92$, $SD = 1.01$), (2) social Media (Weibo/RenRen/Wechat) ($M = 3.59$, $SD = 1.57$), (3) the US Embassy ($M = 3.27$, $SD = 1.58$) and (4) talking to friends and family ($M = 2.48$, $SD = 1.05$). Again, the fifth source of “other” was omitted for this measure, as it was too vague to be interpretable.

Perceived improvement in air quality was captured by asking, “The air pollution in Beijing has improved since 2013” on a scale from 1 (strongly disagree) to 5 (strongly agree) ($M = 4.57$, $SD = 0.74$).

Demographics

Demographics were also collected, including (1) gender, (2) age, (3) if the participant worked in an air quality or environmental science field (of which 100% reported that they did not, so this was dropped from subsequent analysis) (4) education and (5) number of years living in Beijing ($M = 15.32$, $SD = 8.96$).

CHAPTER 4

RESULTS

Risk Perceptions

The first research question asked how people in Beijing perceive the risks of PM2.5 air pollution. Exploring nine different dimensions of risk, each on a five-point scale, the survey found that respondents perceived PM2.5 to represent a serious risk in general ($M = 4.64$, $SD = 0.48$). They thought the risks of PM2.5 were well understood by experts ($M = 4.16$, $SD = 0.69$) but were less confident about how well they understood the risks themselves, although this perception was still above the mid-point of the scale ($M = 3.36$, $SD = 0.62$). Respondents reported high levels of worry ($M = 4.44$, $SD = 0.51$) and anger ($M = 4.33$, $SD = 0.53$) about the risk. Respondents perceived PM2.5 to be a serious risk for their family ($M = 4.11$, $SD = 0.49$) and that the government could reduce PM2.5 if it wanted to ($M = 4.02$, $SD = 0.87$), but reported less confidence that they could do things to protect themselves ($M = 3.70$, $SD = 0.74$) or engage in specific behaviors to protect themselves ($M = 3.78$, $SD = 0.67$). While lower in magnitude, these two risk reduction questions were nonetheless above the mid-point of the scale. In sum, PM2.5 is generally considered a serious risk from which respondents only feel somewhat able to protect themselves. Figure 1 reports these averages.

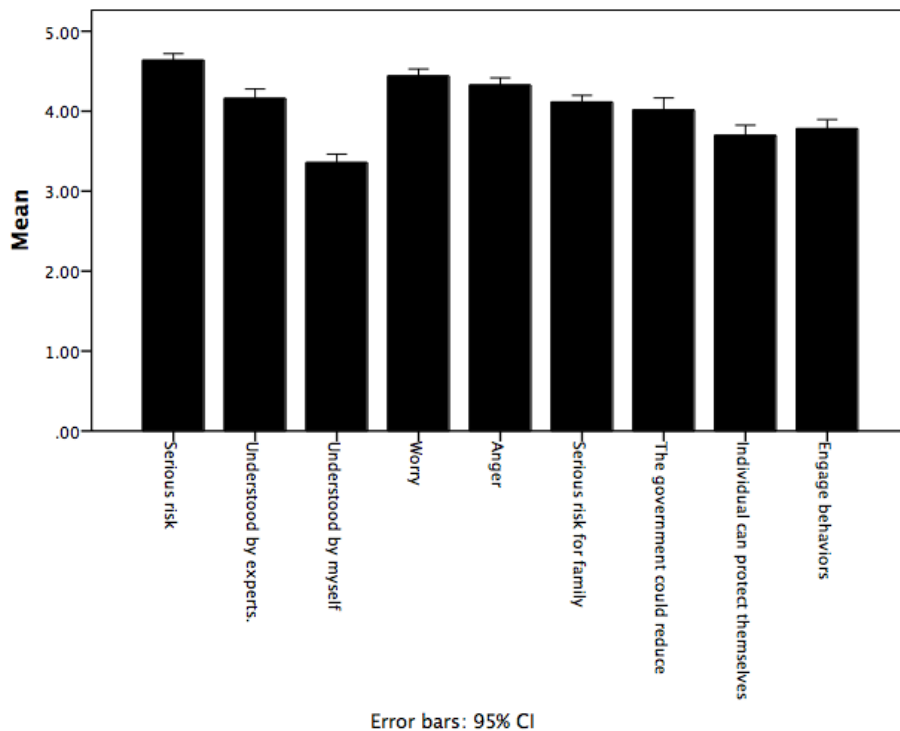


Figure 1. Risk perceptions about PM2.5 in Beijing

Media Use

The second research questions asked what media channels Beijing residents used for information about PM2.5 air pollution. Figure 2 shows that social media was by far the dominant information source ($M = 4.23$, $SD = 0.70$) with interpersonal conversation a distant second ($M = 2.52$, $SD = 1.20$), followed by the US Embassy ($M = 1.89$, $SD = 0.96$). The traditional media was the least frequently used source ($M = 1.36$, $SD = 0.58$).

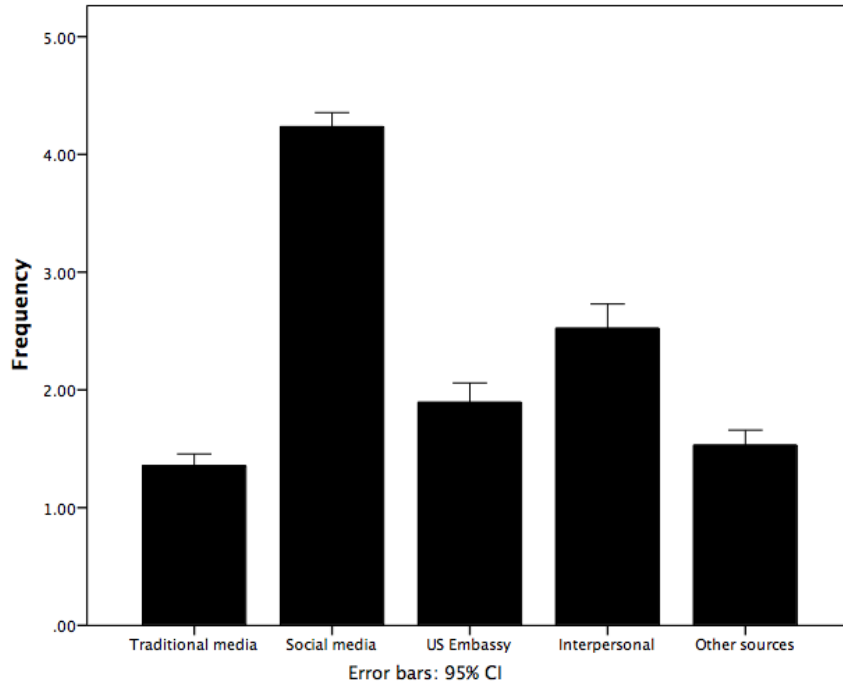


Figure 2. Frequency of media use in getting information about PM2.5

Trust Effects

The first hypothesis predicted that trust in media sources would be positively associated with use of those sources. Hypotheses 2 and 3 predicted that trust in traditional media sources would be associated with less severe risk perceptions of PM2.5 and that trust in social media sources and the U.S. Embassy would be related to more severe risk perceptions of PM2.5, respectively. Four multiple regressions were run to explore these relationships, one with the trust of each of the information sources as a dependent variable. For each of the regressions, the demographic variables of gender, age, education and years living in Beijing were entered in the first block. Frequency of each of the four sources was entered as the second block. Finally, the nine risk perception factors were entered as the third block.

Table 1. Results of multiple regression analysis exploring relationships between trust in traditional media and social media on factors related to PM2.5 air pollution.

Predictors	Traditional Media			Social Media		
	<i>B</i>	<i>SE</i>	β	<i>B</i>	<i>SE</i>	β
<i>Block 1</i>						
Gender	-.23	.14	-.14	.07	.13	.05
Age	.10	.08	.14	.03	.07	.05
Education	-.51	.34	-.18	.02	.32	.01
Years Living	.00	.01	.02	.00	.01	.03
	R² =		.05			.01
<i>Block 2</i>						
Frequency of using traditional media	.06	.12	.04	.11	.11	.10
Frequency of using social media	-.02	.09	-.02	-.01	.09	-.01
Frequency of using US Embassy	.07	.07	.09	-.01	.06	-.01
Frequency of using interpersonal	.09	.06	.15	-.05	.05	-.09
	R² =		.08			.03
<i>Block 3</i>						
Serious	.00	.14	.00	-.21	.14	-.20
Understood by experts	-.14	.10	-.14	.12	.10	.02
Understood by myself	-.09	.11	-.08	.01	.11	.01
Worry	.02	.14	-.01	.12	.13	.92
Anger	.21	.13	.15	.02	.14	.01
Serious for family	.07	.14	.05	-.01	.14	-.01
The government could reduce	-.00	.08	-.01	.09	.08	.12
Citizens can protect themselves	.06	.09	.06	-.07	.09	-.08
Engage behaviors	.30	.10	.28*	-.07	.10	-.07
	R² =		.21			.07

Note. *p<.05. Values reported from block when added.

Table 2. Results of multiple regression analysis exploring relationships between trust in the US Embassy and interpersonal channels on factors related to PM2.5 air pollution.

Predictors	US Embassy			Interpersonal Channels		
	<i>B</i>	<i>SE</i>	β	<i>B</i>	<i>SE</i>	β
<i>Block 1</i>						
Gender	.03	.12	-.02	.01	.13	-.01
Age	.07	.07	-.11	-.02	.07	-.31
Education	-.60	.30	-.24	.12	.32	.05
Years Living	.00	.01	.03	-.01	.01	-.13
	R² =		.04			.02
<i>Block 2</i>						
Frequency of using traditional media	-.04	.10	-.04	.03	.11	.03
Frequency of using social media	-.02	.08	-.02	-.06	.09	.06
Frequency of using US Embassy	.08	.06	.12	-.04	.06	-.05
Frequency of using interpersonal	-.07	.05	-.13	.11	.05	.19*
	R² =		.07			.06
<i>Block 3</i>						
Serious	-.02	.13	-.11	.07	.14	.05
Understood by experts	-.19	.09	-.21	-.04	.10	-.05
Understood by myself	-.00	.10	-.00	-.06	.11	-.06
Worry	-.08	.12	-.07	.01	.13	.01
Anger	.09	.12	.07	.08	.13	.07
Serious for family	.08	.13	.06	-.16	.14	-.11
The government could reduce	.05	.07	.07	.08	.08	.10
Citizens can protect themselves	.16	.08	.19*	.13	.09	.14
Engage behaviors	.01	.09	-.01	.01	.10	.01
	R² =		.16			.11

Note. *p<.05. Values reported from block when added.

The results, shown in Tables 1 and 2, indicate that trust in an information source was only related to increased use of that source for interpersonal information. There was no relationship for trust and use of traditional media, social media or the U.S. Embassy. Therefore, the first hypothesis was not supported.

Similarly, of all the nine risk perception factors, only one was related to three of the different media sources, and this significant factor was not consistent. Trust in traditional media was related to an increased sense the individual could engage in specific behaviors to protect themselves from PM2.5 ($\beta=.28$, $p<.01$). This aligns with the intended direction of hypothesis 2 predicting that the traditional media would be more related to less severe risk perceptions, but with only one significant risk perception factor, hypothesis 2 was weakly supported.

Trust in the U.S. embassy was related to an increased sense that there was action that could be done to reduce the risks ($\beta=.19$, $p=.05$), but this again represent a weak relationship to risk perceptions in general and runs contrary to the expected direction. Thus, Hypotheses 3 was not supported. It is important to note that none of the R^2 from any of these models exploring trust were significant, suggesting that even the statistically significant factors described above should be taken as merely suggestive.

The fourth hypotheses predicted that individuals who were more critical of the government at the time of the controversy would exhibit less trust in traditional media and more trust in social media today and the fifth hypothesis predicted that the same people would exhibit less change in trust toward the traditional media since the controversy. A multiple regression analysis was conducted to test these relationships with governmental fault as the dependent variable. The demographic variables of gender, age, education and years living in Beijing were entered in the first block. Trustworthiness of the four information sources was entered as the second block. Perceived change of the trustworthiness for each of the four sources was entered as the third block. Finally, the perception of actual improvement in air quality was entered in the fourth block.

As shown in Table 3, none of the demographic, trustworthiness or change in

trustworthiness factors was related to strength of governmental criticism during the controversy.

Only the perception of actual improvement in air quality was related to governmental criticism ($\beta = .22, p = .02$). The direction suggests that the more critical individuals were of the government during the time of the controversy, the more those people also perceived that air pollution has improved since then.

Table 3. Regression analysis predicting relationship of perceived fault of the Chinese government regarding PM2.5 information on current trust.

Predictors	Government was Untrustworthy		
	<i>B</i>	<i>SE</i>	β
<i>Block 1</i>			
Gender	-.13	.14	-.08
Age	-.04	.08	-.06
Education	-.11	.34	-.04
Years Living	-.01	.01	-.10
$R^2 =$			0.12
<i>Block 2</i>			
Traditional trust	.06	.09	.06
Social trust	.05	.10	.05
Embassy trust	-.11	.10	-.10
Interpersonal trust	.12	.10	.12
$R^2 =$.20
<i>Block 3</i>			
Increased traditional trust	-.03	.07	-.04
Increased social trust	-.01	.04	-.01
Increased embassy trust	-.01	.04	-.02
Increased interpersonal trust	.04	.07	.06
$R^2 =$			0.21
<i>Block 4</i>			
Perception of air improved	.21	.09	.22*
$R^2 =$.30*

Note. * $p < .05$. Values reported from block when added.

CHAPTER 5

DISCUSSION AND CONCLUSIONS

While air pollution has been a problem in Beijing for decades, the specific risk of PM2.5 air pollution became known to the public during a prominent controversy when activists on social media and the U.S. Embassy criticized the state-run traditional media of covering up the risk and not protecting people in Beijing. This study sought to measure the risk perceptions of people in Beijing regarding PM2.5 air pollution and to determine the long-term influence of this trust-breaking event.

Results found that respondents perceived PM2.5 air pollution as a serious threat, both to society in general and to their family in particular. Respondents reported high levels of worry and anger and thought the government could reduce the risk if it wanted to. They thought experts generally understood the risks even though they felt less informed. Respondents reported knowing they could do things to protect themselves and engage in specific behaviors to protect themselves, yet these values were less pronounced than the other risk perception factors. Returning to theories of risk perception to categorize this risk, these results suggest that PM2.5 air pollution represents a risk highly charged in negative emotion or dread, and one that is likely amplified because blame and anger is involved. However, this risk is perceived to be understandable, at least by experts, and respondents noted moderate levels of self-efficacy to protect themselves, factors which likely attenuate to some degree the valence of the perceived risk regarding this threat. Nonetheless, these results suggest that the fairly novel risk of PM2.5 air pollution is currently viewed as a significant risk by people in Beijing across multiple risk dimensions.

Previous research suggests that Chinese social media platforms exhibit less censorship than traditional media and are therefore more trusted. Similarly, because the controversy regarding PM2.5 was in part instigated by activists on social media, it was hypothesized that more people would seek information about PM2.5 from social media sources as compared to the traditional media. Indeed, results showed that social media was the more used source and traditional media the least used source for PM2.5 information.

However, the hypothesized role of trust in these relationships did not emerge. More trusted sources were not more often used, except in the case of interpersonal sources. Likewise, trust in information sources did not lead to large changes in risk perceptions. Out of the nine risk perceptions factors, trust in traditional media only significantly related to one factor, increased behaviors to reduce risk. Likewise, trust in social media only significantly related decreased perceived seriousness of risk and trust in the U.S. Embassy only significantly related increased self-efficacy, both of which were in the opposite direction of predictions.

This general lack of relationships could be interpreted a number of ways. It could be that there actually is little relationship between trust, media use and risk perceptions in this context. The hypotheses are based on the assumption that there were different and conflicting messages related to air pollutions coming from the different media sources measured in this study. If the messages were not substantially different, it is possible that there was no effect to be found. This scenario seems unlikely, as many examples in the literature describe differences between these media sources that would theoretically impact the other measured factors. A historical content analysis of these sources could provide clearer evidence of these differences, yet the assumption of different media messages appears founded.

A second scenario explaining the lack of relationships could also be that even if the messages were substantially different, trust represents a minor factor in how individuals choose media sources and come to accept messages. This too seems unlikely, as the literature highlights trust as a crucial factor in risk perceptions constructions across many contexts. It could be that the majority of these past studies were done in Western contexts and Chinese populations culturally construct risk perceptions differently, a possibility that would require more cross-cultural studies within this context.

However, and more likely, this lack of a major finding may also represent a weak measure of trust. The Meyer's credibility index is a validated scale that was not reliable for this sample. As such, the measure of trust used was a single item, which can substantially reduce validity. A broader reason for the failure of the Meyer's credibility index to reach reliability may be that in a society such as China where dissident views are regularly punished, as evidenced in the history of the controversy itself, respondents did not feel comfortable sharing their views about this topic.

This may also explain why the final research question also showed minimal effects. One major question of this study was to explore how trust changes years after a trust-breaking event occurs regarding a risk. Results found no relationship between individuals more impacted by the trust breaking event and change in trust over time. The only significant relationship was that individuals who agreed with the social media activists during the time of the controversy and placed more blame on the government were more likely to perceive greater improvements in air pollution since then. This may merely represent the fact that because these people were initially more critical, there was more distance for them to change to align with current improvements in air quality.

In sum, some of these results align with the concepts mentioned in the literature review while other results diverge in interesting ways. This study captured the factors from the psychometric paradigm on which people in Beijing construct their risk perceptions about the novel risk of PM2.5. The variations between these factors can inform future messages better targeting existing concerns or misunderstandings toward more adaptive attitudes and behaviors to protect individuals' health. Likewise, the differences in media use also mirrors the expectations from the literature and can suggest outlets for better reaching people in Beijing about future risks related to air pollution.

However, previous studies would predict perceived trustworthiness of sources to impact resultant risk perceptions, but these effects were not found. The most likely reason is methodological, as the measure used to capture trust was a single item and collected in a society where expressing opinions critical of the government can be met with punishment. As such, these results should not be seen as challenging existing expectations of trust within risk communication, but as a methodological reminder to ensure redundant measures of important variables and to take cultural contexts into account when developing survey items.

Limitations and future study

While this study offers one of the first empirical measures of how people in Beijing form risk perceptions of PM2.5 with a theoretical link to trust in sources, there are many limitations as well. Because the snowball sample began in one university, it likely limited participation to students from that university. On one hand, this represents a sample likely to use social media and indeed all of the respondents were aware of the controversy. However, is it not a sample generalizable to all people in Beijing. Future studies should expand the sample to explore relationships of these variables among more diverse populations.

As discussed previously, another limitation is that the measure of trust used was weak, possibly due to a hesitance among respondents to freely divulge their opinions because of a worry of possible repercussions. These worries are not unfounded as many of the prominent critics who voiced their critiques over social media during the 2012 controversy were punished or even jailed. This is a difficult limitation to overcome. Obviously, more assurances about anonymity need to be communicated and maintained in future studies before this particular sample may feel comfortable providing valid answers.

Finally, this study used quantitative methods to identify broad levels of risk perceptions and trust, but future research could probe more deeply with qualitative methods to explore how and why people trust the risk information from specific media and how they interact with their multiple factors like psychological or cultural processes.

In conclusion, this study is one of the first to deconstruct and empirically measure how people in Beijing perceive the novel risk of PM2.5 air pollution. As results find that it is perceived as a serious risk facing both individuals and society, more research should explore the implications of media messages and media choice on these perceptions and behaviors.

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APPENDIX A
SURVEY QUESTIONNAIRE

Part I Risk knowledge, perception and behavior (*For each of the items below, please choose only one answer.*)

1. Do you live in Beijing?

(1) Yes

(2) No

2. Many people claim Beijing faces serious problems with air pollution. Please select your level of agreement with the following questions (On a scale of 1 to 5 where 1 is strongly disagree and 5 is strongly agree).

	1=Strongly Disagree	2=Disagree	3=Neither agree nor disagree	4=Agree	5=Strongly Agree
Air pollution in Beijing represents a serious risk for human health.					
The risks surrounding air pollution in Beijing are well					

understood by experts.					
I feel I understand the risks surrounding air pollution					
I worry a lot about air pollution.					
I am angry about the problems of air pollution in Beijing.					
Air pollution in Beijing represents a serious risk for myself or my family					
The government could reduce air pollution if it wanted to					
Individual					

citizens can do things to protect themselves from air pollution.					
I engage in specific behaviors to protect myself from these risks					

5. Not all air pollution is the same. One specific type of air pollution is called PM2.5. Have you heard of this type of air pollution?

(1) Yes

(2) No

6. If yes, please select your level of agreement with the following PM2.5 questions (On a scale of 1 to 5 where 1 is strongly disagree and 5 is strongly agree).

	1=Strongly Disagree	2=Disagree	3=Neither agree nor disagree	4=Agree	5=Strongly Agree
PM2.5 in Beijing represents a serious risk for human health.					
The risks					

surrounding PM2.5 in Beijing are well understood by experts.					
I feel I understand the risks surrounding PM2.5					
I worry a lot about PM2.5.					
I am angry about the problem of PM2.5 in Beijing.					
PM2.5 in Beijing represents a serious risk for myself or my family					
The government could reduce PM2.5 if it wanted to					

Individual citizens can do things to protect themselves from PM2.5.					
I engage in specific behaviors to protect myself from PM2.5.					

Part II Media Consumption and Performance

7. How often do you get information about air pollution from the following sources? (On a scale of 1 to 5 where 1 is never and 5 is very often.)

	1				5
(1) Traditional Media (Air Quality Index)	_____	:	_____	:	_____
(2) Social Media (Weibo/RenRen/ Wechat)	_____	:	_____	:	_____
(3) US Embassy	_____	:	_____	:	_____
(4) Talking to friends and family	_____	:	_____	:	_____
(5) Others	_____	:	_____	:	_____

8. How often do you get information specifically about PM2.5 air pollution from the following sources? On a scale of 1 to 5 where 1 is never and 5 is very often.)

	1				5
(1) Traditional Media (Air Quality Index)	_____	:	_____	:	_____
(2) Social Media (Weibo/RenRen/ Wechat)	_____	:	_____	:	_____
(3) US Embassy	_____	:	_____	:	_____
(4) Talking to friends and family	_____	:	_____	:	_____
(5) Others	_____	:	_____	:	_____

9.To what extent do you think the traditional media (Air Quality Index) does a good job of informing you about the air pollution? In regards to information about air quality, the traditional media...

	1	2	3	4	5	
Can't be trusted	_____	:	_____	:	_____	Can be trusted
Is inaccurate	_____	:	_____	:	_____	Is accurate
Is unfair	_____	:	_____	:	_____	Is fair
Doesn't tell whole story	_____	:	_____	:	_____	Tells the whole story
Is biased	_____	:	_____	:	_____	Is unbiased

10.To what extent do you think the social media does a good job of informing you about the air pollution? In regards to information about air quality, social media...

	1	2	3	4	5	
Can't be trusted	_____	:	_____	:	_____	Can be trusted
Is inaccurate	_____	:	_____	:	_____	Is accurate

Is unfair	_____ : _____ : _____ : _____ : _____	Is fair
Doesn't tell whole story	_____ : _____ : _____ : _____ : _____	Tells the whole story
Is biased	_____ : _____ : _____ : _____ : _____	Is unbiased

11. To what extent do you think the US embassy does a good job of informing you about the air pollution? The US Embassy air quality readings...

	1	2	3	4	5	
Can't be trusted	_____	_____	_____	_____	_____	Can be trusted
Is inaccurate	_____	_____	_____	_____	_____	Is accurate
Is unfair	_____	_____	_____	_____	_____	Is fair
Doesn't tell whole story	_____	_____	_____	_____	_____	Tells the whole story
Is biased	_____	_____	_____	_____	_____	Is unbiased

12. To what extent do you think talking to friends and family does a good job of informing you about the air pollution? In regards to information about air quality, my friends and family...

	1	2	3	4	5	
Can't be trusted	_____	_____	_____	_____	_____	Can be trusted
Is inaccurate	_____	_____	_____	_____	_____	Is accurate
Is unfair	_____	_____	_____	_____	_____	Is fair
Doesn't tell whole story	_____	_____	_____	_____	_____	Tells the whole story

Is biased _____:_____:_____:_____:_____ Is unbiased

Part III Change since 2012

In late 2012 and early 2013, there was a controversy when the official air quality index was much more positive than the air quality measures released from the US Embassy in Beijing.

Some people on social media criticized the government claiming it was hiding the dangers of PM2.5 air pollution from its citizens.

13. Do you remember this controversy?

(1) Yes

(2) No

14. If yes, how much do you agree with the social media groups that at that time, the government was untrustworthy?

Strongly Disagree _____:_____:_____:_____:_____ Strongly Agree

15. Please select your level of agreement with each statement.

	1=Strongly Disagree	2=Disagree	3=Agree	4=Strongly Agree	5= No Change
The air pollution in Beijing has improved since 2013.					
My trust in air					

pollution information from traditional media has increased since 2013.					
My trust in air pollution information from social media has increased since 2013.					
My trust in air pollution information from the US embassy has increased since 2013.					
My trust in air pollution information from friends and family has increased since 2013.					

Part IV Demographic Information

16. Gender

(1) Male

(2) Female

17. Age

18. Do you work in an air quality or environmental science field?

(1) Yes

(2) No

19. What is the highest formal education you have completed?

(1) Less than high school graduate

(2) High school graduate

(3) Vocational school/ technical school/ junior college

(4) Undergraduate education

(5) Graduate education and higher

20. How many years have you lived in Beijing? _____ year(s)

APPENDIX B

SURVEY QUESTIONNAIRE (Chinese)

您被邀请参加此次关于北京 PM2.5 以及环境污染的风险认识问卷，本次问卷包含一些被修改的材料信息。您的参与是自愿的。您可以自愿不参加此次问卷，或者您不愿回答其中的某些问题或者题目，您可以随时省略或者跳过。所有的参与者必须年满 18 岁。

第一部分 风险知识，认知和行为（单选）

1. 您住在北京吗？

- (1) 是
(2) 否

2. 许多人认为北京现在面临严肃的环境污染问题，请在下表中选择您认为一致的答案

(表格中 1 代表十分不同意，5 代表十分同意，程度递增).

	1=十分不同意	2=不同意	3=既没不同意也没有同意	4=同意	5=十分同意
北京的空气污染作为严重的风险对于人类的健康					
专家对于北京的空气污染有很好的认知					
我对于北京的空					

气污染有很好的 认知					
我很担心对于 北京的空气污 染					
我很生气对于北 京的空气污染					
北京的空气污染 对我的家庭和朋 友有很大威胁					
北京的空气污染 是政府可以治理 的					
市民自己可以做 一些保护措施避 免空气污染					
我乐于去从事一 些活动避免空气 污染					

5.并不是所有空气污染都是相同的，一种特殊的空气污染被称为 PM2.5, 您之前听说过这类空气污染嘛?

(1) 是的

(2) 没有

6. 如果有的，请选择在下表中您认为一致的答案 (表格中 1 代表十分不同意，5 代表十分同意，程度递增).

	1=十分不同意	2=不同意	3=既没不同意也没有同意	4= 同意	5=十分同意
北京的 PM2.5 空气污染作为严重的风险对于人类的健康					
专家对于北京的 PM2.5 空气污染有很好的认知					
我对于北京的 PM2.5 空气污染有很好的认知					

我很担心对于北京的 PM2.5 空气污染					
我很生气对于北京的 PM2.5 污染					
北京的 PM2.5 污染对我的家庭和 朋友有很大威胁					
北京的 PM2.5 污染是政府可以治理的					
市民自己可以做一些保护措施避免 PM2.5 污染					
我乐于去从事一些活动避免 PM2.5 空气污染					

第二部分 媒体使用习惯和偏好 Part II Media Consumption and Performance

7. 对于不同媒体您获取空气污染信息的来源与频率 (1代表没有选择过, 5代表经常选择)

呢, 程度由1到5依次递增

	1				5
(1) 传统媒体 (空气质量监测报告)	_____	:	_____	:	_____
(2) 社交媒体	_____	:	_____	:	_____
(3) 美国驻北京使馆	_____	:	_____	:	_____
(4) 与朋友和家人获取	_____	:	_____	:	_____
(5) 其他	_____	:	_____	:	_____

8. 对于不同媒体您获取 PM2.5 污染信息的来源与频率 (1 代表没有选择过, 5 代表经常选择呢, 程度由 1 到 5 依次递增

	1				5
(1) 传统媒体 (空气质量监测报告)	_____	:	_____	:	_____
(2) 社交媒体	_____	:	_____	:	_____
(3) 美国驻北京使馆	_____	:	_____	:	_____
(4) 与朋友和家人获取	_____	:	_____	:	_____
(5) 其他	_____	:	_____	:	_____

9. 您认为传统媒体是否有效告知空气污染的信息

	1	2	3	4	5
无法信任	_____	:	_____	:	_____
					能够被信任
不准确	_____	:	_____	:	_____
					准确

不直观清晰 _____ : _____ : _____ : _____ : _____ 直观清晰
 未告知全部 _____ : _____ : _____ : _____ : _____ 全面告知
 偏见的 _____ : _____ : _____ : _____ : _____ 客观的

10. 您认为社交媒体是否有效告知空气污染的信息

1 2 3 4 5

无法信任 _____ : _____ : _____ : _____ : _____ 能够被信任
 不准确 _____ : _____ : _____ : _____ : _____ 准确
 不直观清晰 _____ : _____ : _____ : _____ : _____ 直观清晰
 未告知全部 _____ : _____ : _____ : _____ : _____ 全面告知
 偏见的 _____ : _____ : _____ : _____ : _____ 客观的

11. 您认为美国驻京使馆是否有效告知空气污染的信息

1 2 3 4 5

无法信任 _____ : _____ : _____ : _____ : _____ 能够被信任
 不准确 _____ : _____ : _____ : _____ : _____ 准确
 不直观清晰 _____ : _____ : _____ : _____ : _____ 直观清晰
 未告知全部 _____ : _____ : _____ : _____ : _____ 全面告知
 偏见的 _____ : _____ : _____ : _____ : _____ 客观的

sed

12. 您认为家人与朋友是否有效告知空气污染的信息

	1	2	3	4	5	
无法信任	_____	_____	_____	_____	_____	能够被信任
不准确	_____	_____	_____	_____	_____	准确
不直观清晰	_____	_____	_____	_____	_____	直观清晰
未告知全部	_____	_____	_____	_____	_____	全面告知
偏见的	_____	_____	_____	_____	_____	客观的

第三部分从 2012 年改变

自 2012 年末到 2013 年初，政府官方的空气质量检测报告中 PM2.5 污染程度总是低于美国驻京使馆的报告程度，这在社交媒体中引起了很大的争议，一些人批评政府隐瞒了 PM2.5 严重程度。

13. 您是否还记得这个争论？

(1) 记得

(2) 不记得

14. 如果记得您认为政府是否向社交媒体中所说不值得信任？

非常不同意 _____ : _____ : _____ : _____ : _____ 非常同意

15. 请选择在下表中您认为一致的答案 (表格中 1 代表十分不同意，5 代表十分同意，程度递增)..

	1=十分不同意	2=不同意	3=没有改变	4=同意	5=十分同意
北京空气污染改善了自从 2013					
自从 2013，我对于从传统媒体获取空气污染信息的信任增加了					
自从 2013，我对于从社交媒体获取空气污染信息的信任增加了.					
自从 2013，我对于从美国使馆获取空气污染信息的信任增加了					
自从 2013，我对于从朋友或家人获取空气污染信息的信任增加了					

第四部分基本信息

16.性别

(1) 男

(2) 女

17. 年龄

18. 您是否在相关的环境研究领域工作?

(1) 是

(2) 否

19. 您当前最高程度的教育水平

(1) 低于高中水平

(2) 高中毕业

(3) 高级职业学校

(4) 大学本科

(5) 研究生或更高

20. 您在北京生活了多少 _____ 年?