How Does News Media Exposure Amplify Publics' Perceived Health Risks About Air Pollution in China? A Conditional Media Effect Approach

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This study examines how the effect of news media exposure on perceived health risks is conditioned by perceived self-relevance and perceived news credibility, based on the issue of air pollution in China. An online survey ($N = 1,257$) showed that the positive association between news media exposure and perceived health risks was stronger in conditions where perceived self-relevance was high than in conditions where perceived self-relevance was low. Furthermore, in conditions where perceived self-relevance was low, this positive association was stronger in the condition where perceived news credibility was high than the condition where perceived news credibility was low. The conditional media effect approach to public risk perceptions explicates the mechanism of the individual stations in the social amplification of risk framework (SARF) and highlights SARF's individual aspect. Moreover, this approach indicates that individuals have some level of agency to select from numerous news based on perceived self-relevance, whereas this selective exposure is not necessarily accompanied by critical judgment of news credibility. These findings anticipate an ongoing tension between ubiquitous media influence and individual agency.

Keywords: news media exposure, perceived self-relevance, perceived news credibility, perceived health risks, SARF, air pollution

In the past few decades, air pollution has been a chronic environmental problem and a threat to public health in China. However, air pollution did not attract nationwide public attention until 2008, when the U.S. embassy in Beijing placed an air quality sensor on its roof and began to publish the air quality index on Twitter (Kay, Zhao, & Sui, 2015). Since 2013, the enforcement of air pollution regulation by the Ministry of Ecology and Environment of the People's Republic of China[2] has facilitated nationwide news coverage

each time an air pollution alert is issued. The coverage usually refers to the severity and potential harm of air pollution to public health. For instance, health risks associated with air pollution ranked as the most frequently covered topics in China's official news media (Duan & Takahashi, 2017); meanwhile, the commercial news media also emphasized the serious consequences of air pollution to human health (H. Li & Svarverud, 2018). Through exposure to risks-related news coverage in various media channels, public perceptions of the health risks associated with air pollution have been accordingly shaped and influenced.

Publics' perceived health risks refer to their intuitive judgments of the potential harm of air pollution to human health. Understanding publics' perceived health risks about air pollution matters a lot for individual well-being as well as for the social good. On the positive side, individuals' perceived moderate and reasonable health risks motivate them to take proactive measures to protect themselves from the hazards of air pollution; such perceived health risks tend to facilitate the public to support environmental protection policies and to participate in proenvironmental activities (J. Huang & Yang, 2019). On the negative side, however, individuals' perceived high and unreasonable health risks are likely to result in irrationally high concern and to incite panic and unnecessary public fear (see Ng, Yang, & Vishwanath, 2018). These responses could further undermine public trust in risk regulators, thereby weakening the efficacy of risk management (Löfstedt, 2005).

News media have been a major information source for the general public to seek and acquire information about health risks (McComas, 2006). Previous studies on publics' perceived health risks in relation to news media can be generally divided into two categories. The first category concentrates on news coverage and analyzes the features of news content, such as the narrative strategies and themes (Cacciatore et al., 2012; Harrington, Elliott, & Clarke, 2012; McInerney, Bird, & Nucci, 2004). The second research category shifts the focus from news coverage as an external information source to individuals' psychological response to this information, and discusses the amplifying effect of individuals' news media exposure on their perceived health risks (e.g., Ackerson & Viswanath, 2010; Bakir, 2006; Frewer, Miles, & Marsh, 2002; H. Kim, Jang, & Noh, 2019).

Overall, the aforementioned studies stress the importance of news media activities and assume that individuals are passive message recipients, whose risk perceptions are directly shaped and amplified by the news coverage that they are exposed to. However, considering the increasing information availability and accessibility in recent years, members of the public not only select from various risk information based on certain criteria (e.g., Choi, Shin, Park, & Yoo, 2018; Jun, Kim, & Wu, 2019) but also tend to critically judge the information quality (Johnson & Kaye, 2004; Melican & Dixon, 2008; X. Yang, Chen, & Feng, 2016). This requires us to explicate the active role of individuals in responding to news coverage of health risk issues. Accordingly, based on the issue of air pollution in China, this study proposes a conditional media effect approach to explicate individuals' selective exposure to associated news coverage and critical judgment of news quality, thereby understanding the role of individual agency in media amplification of public risk perceptions.

Conceptualization

Theoretical Resources for Developing the Conditional Media Effect Approach

The social amplification of risk framework (SARF) and the elaboration likelihood model (ELM) serve as the theoretical resources that contribute to developing the conditional media effect approach. SARF is a comprehensive conceptual framework that aims to explain the ways in which risks-related information flows between various social actors and how individuals respond to and process this information, thus leading to amplified or attenuated public risk perceptions and related social consequences (see Kasperson, Kasperson, Pidgeon, & Slovic, 2003; Kasperson et al. 1988). In mediatized societies, individuals perceive and learn about risks from mass media in most circumstances, and the majority of news coverage tends to emphasize the risks embedded in the issue under examination (Kasperson et al., 1988; Smith & Fischbacher, 2009). This makes news media a major social actor among others that amplify people's perceived risks. Notably, the process by which an individual responds to and processes risk-associated media messages, termed "individual stations" in SARF (Kasperson et al., 2003, p. 14), indicates the individual-level psychological response to news coverage that underlies media amplification of public risk perceptions.

The ELM provides a rationale for illustrating the mechanism of the individual stations in SARF. The ELM proposes two routes in which individuals respond to and process information: The central route indicates that individuals consume a certain amount of cognitive effort to evaluate the message, whereas the peripheral route implies that individuals ignore the message per se and rely on cues beyond the message to make quick judgments (Petty & Cacioppo, 1986). To examine the effect of individuals' news exposure rather than cues beyond the news content on their perceived health risks, this study focuses on the central route. Noticeably, the central route can be understood from an elaboration continuum (see Benoit & Smythe, 2003). One end point on the elaboration continuum indicates that an individual merely pays attention to the issue-relevant message, but uses limited cognitive effort to critically judge the message. In contrast, the other end point on the continuum implies that an individual not only pays attention to the message but also makes critical judgment of the content. Along the elaboration continuum, merely paying attention to the message and making critical judgment both lead to salient communication effects (Petty & Cacioppo, 1986), but the magnitude of the effect differs. Consequently, the extent to which news media exposure amplifies public risk perceptions depends largely on the degree of individuals' attention to and critical judgment of the news.

The individual stations in SARF justifies and contextualizes individual-level media effects resulting from exposure to risk-associated news coverage, whereas the ELM informs the conditional feature of the media effects through identifying the conditions where individuals' perceived risks are most likely to be amplified. Taken together, the conditional media effect approach highlights the individual aspect of SARF, which has been overlooked in previous studies that examined the social aspect of SARF—namely, how cultural and institutional factors contribute to social amplification of public risk perceptions (Bakir, 2005; Chung, 2011; Harrison, Todd, & Lawton, 2008; Zhang, Xu, & Zhang, 2017). The following two sections first explain the amplifying effect of news media exposure on perceived health risks, and then apply the conditional media effect approach to explicating the mechanism underlying this effect.

News Media Exposure Amplifies Publics' Perceived Health Risks

People's exposure to news coverage of air pollution tends to influence their risk perceptions. News media exposure refers to the frequency that individuals encounter news coverage of air pollution through various media outlets, including traditional mass media outlets (e.g., newspapers, television, radio), portal news websites (e.g., Sina News, Tencent News, NetEase), and social media sites (e.g., WeChat, Weibo). This study does not differentiate between Web-based and traditional media outlets, because news coverage in these media outlets has been highly consistent in emphasizing air pollution hazards to human health since 2013 in China (Wong, 2013).

Studies have shown that people's frequent exposure to news coverage of health risk-related events strengthens their perceived risks. Overall, individuals' frequent and repeated exposure to risk-related news in various media outlets tends to increase the magnitude of their perceived risks (Wahlberg & Sjoberg, 2000). This has been supported in relation to health risk-related events or phenomena, such as global warming (Thaker, Zhao, & Leiserowitz, 2017), respiratory infectious disease (Choi et al., 2018), potential environmental pollution (Bakir, 2006), and food safety issues (Frewer et al., 2002; You & Ju, 2017).

In terms of air pollution, some studies have shown or indirectly indicated a positive correlation between people's news media exposure and their perceived health risks. For example, people's frequent exposure to information about air pollution in both traditional media outlets and social media was positively related to their perceived health risks (Q. Huang, 2018). In particular, the more frequently individuals were exposed to *Under the Dome*, a controversial documentary released in 2015 that investigated the hazards of air pollution, the stronger their perceived health risks were (J. Huang & Yang, 2019). Likewise, a positive relationship between the public's social media exposure frequency and their perceived health risks was supported during the smoke haze that broke out in Singapore in 2013 (Ng et al., 2018). Accordingly, this study posits the first hypothesis to test the amplifying effect of news media exposure on publics' perceived health risks:

H1:   *The frequency of individuals' news media exposure will positively predict the level of their perceived health risks.*

The Conditional Amplifying Effect of News Media Exposure on Perceived Health Risks

Given the overall amplifying effect of frequent news exposure on people's perceived health risks, the conditional media effect approach further illustrates that the magnitude of this effect is conditional: It depends on the extent to which individuals pay attention to or critically judge the news content related to air pollution hazards. Particularly, an individual's perceived self-relevance to air pollution hazards fosters the conditions under which the individual is most likely to pay attention to the encountered news, while the evaluation of news credibility formulates the conditions where he or she critically judges the news content. Both perceived self-relevance and perceived news credibility are considered major factors that condition the amplifying effect.

An individual's perceived self-relevance to an issue is a major motive that drives the individual to pay attention to the issue-relevant information, thereby serving as a precondition of generating media effects. In issues such as food safety problems, online community relationships building, and mobile tourism promotion, previous ELM research has shown that when individuals perceive high levels of self-relevance to the issue, they are more likely to follow the issue-relevant message than when they perceive low levels of self-relevance, which then leads to salient changes in attitudes or behaviors (C. D. Chen & Ku, 2013; Frewer, Howard, Hedderley, & Shepherd, 1997; M. J. Kim, Chung, Lee, & Preis, 2016). Likewise, when an individual perceives a high level of self-relevance to the consequences of air pollution, he or she is motivated to pay attention to the news coverage and seek for information about the harm and possible solutions to cope with the threat to health. Hence, it posits a hypothesis to test the moderating role of perceived self-relevance in media amplification of public risk perceptions:

H2:   *The positive correlation between news media exposure and perceived health risks will be stronger in conditions where the level of perceived self-relevance is high than in conditions where the level of perceived self-relevance is low.*

Studies on the ELM have shown that an individual's critical judgment of a piece of message is usually manifested through his or her evaluation of message quality (M. J. Kim et al., 2016; Meservy, Jensen, & Fadel, 2013). Among the massive amount of news coverage of air pollution, misinformation or even fake news may exist (H. C. Li, forthcoming). Therefore, people's evaluation of news credibility indicates their critical judgment of news quality. As aforementioned, when people perceive themselves highly relevant to air pollution hazards, they are more inclined to negativity bias that motivates them to frequently pay attention to news coverage that emphasizes the hazards. However, the inclination to negativity bias tends to restrict one's sound reasoning and critical thinking (Meffert, Chung, Joiner, Waks, & Garst, 2006). In such circumstances, an individual is less likely to critically judge the quality of news content, thereby dismantling the moderating effect of perceived news credibility. By contrast, perceived news credibility is expected to moderate media amplification of public risk perceptions when the level of perceived self-relevance is low:

H3a: *Perceived news credibility will moderate the positive correlation between news media exposure and perceived health risks in conditions where the level of perceived self-relevance is low, whereas the moderating effect will be insignificant in conditions where the level of perceived self-relevance is high.*

More specifically, when people perceive low levels of self-relevance to air pollution hazards, the more credible they judge the news content to be, the more likely their perceived health risks are to be amplified during their frequent exposure to news coverage:

H3b: *In conditions where the degree of perceived self-relevance is low, the positive correlation between news media exposure and perceived health risks will be stronger in the condition where the level of perceived news credibility is high than in the condition where the level of perceived news credibility is low.*

The hypotheses posited in this study constitute a three-way interaction effect of news media exposure, perceived self-relevance, and perceived news credibility on perceived health risks. Figure 1 illustrates the conceptual framework with the hypothesized relationships among key variables.

Conditions of the news media effect
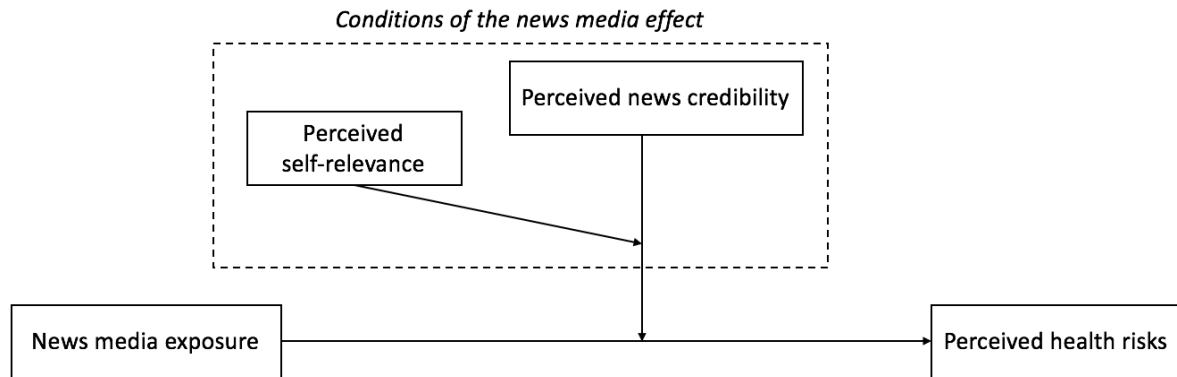
Figure 1. The conceptual framework with hypothesized relationships among the examined variables.

Method

Sample

This study used cross-sectional survey data to test the research hypotheses. The data were collected from March 4–7, 2016, shortly after severe air pollution occurred across China ("163 Cities," 2016). During that time, intensive news coverage of air pollution and its hazards to human health was widely circulated in various media channels, significantly influencing the general public's perceived health risks. Against this backdrop, this study tried to survey how news coverage influenced publics' perceived health risks when they were repeatedly exposed to intensive news coverage.

Sojump, a professional online survey company in China, was commissioned to collect survey data. As air pollution had become a highly visible issue across the nation during that time, respondents from seven major geographic regions of China were requested. Sojump provides a sampling service that consists of 2.6 million registered respondents with diverse demographic features distributed throughout China. Because of the lack of resources to conduct nationally representative sampling, the current study regarded Sojump's sampling service as the sampling frame and employed a random sampling strategy within this sampling frame. This sampling strategy has been used in a number of studies that examined major social issues and phenomena in Chinese societies (e.g., Chen, Cheng, & Urpelainen, 2016; Q. Huang, 2019; Lien & Cao, 2014; Zhou, Wu, Zhang, & Xu, 2013).

For the sampling procedure, Sojump was requested to recruit 1,500 respondents to participate in the online survey. Each registered respondent in Sojump's sampling service was assigned an ID number ranging from 1 to 2,600,000, and 1,500 random integers between the value of 1 and 2,600,000 were generated. According to the 1,500 randomly generated integers, 1,500 respondents were randomly

recruited from the sampling service. A sample of 1,500 respondents were sent an e-mail invitation to participate in the online survey, and 1,369 respondents completed the questionnaire, with a very high response rate of 91.3%. The questionnaire included 30 questions, which required at least 10 minutes to finish (Hopper, 2017). Therefore, questionnaires with a completion time of less than 10 minutes were considered invalid. Also, those that lacked answers to the key variables were deleted. Finally, a total of 1,257 valid questionnaires were collected.

The sample consisted of 685 (54.5%) males and 572 (45.5%) females, and the mean age was 32 years. In terms of education, 15.1% (n = 189) of the sample were high school graduates or below, 76.4% (n = 960) were current college students or graduates, and 8.6% (n = 108) were postgraduates. With regard to individual monthly income, 31.7% (n = 399) of the sample earned 4,000 Chinese Yuan (CNY) or less, 53.5% (n = 672) earned between 4,000 and 10,000 CNY, and 14.8% (n = 186) earned more than 10,000 CNY. The geographic distribution of the sample was as follows: 35.6% lived in East China (n = 447), 16.6% in the North (n = 209), 16.0% in the South (n = 201), 15.0% in Central China (n = 189), 7.4% in the Southwest (n = 93), 6.4% in the Northeast (n = 81), and 2.9% in the Northwest (n = 37).

Measures

News Media Exposure

News media exposure was measured by five items on a 7-point scale ranging from 1 (*never*) to 7 (*very frequently*). Each item asked respondents how frequently they encountered news coverage of air pollution through the following media channels: (1) newspapers, (2) television, (3) radio, (4) portal websites, and (5) social media. These items were averaged to create a composite index, with higher values indicating a greater frequency of exposure to news coverage of air pollution (M = 5.41, SD = 1.13, Cronbach's α = .89). To ensure that the composite measures examined only a single dimension of news media exposure, an exploratory factor analysis (EFA) was conducted using the principal component extraction method. Only factors with eigenvalues greater than 1.00 were extracted for each analysis. For the composite measurement of news media exposure, only one factor with an eigenvalue of 3.70 was extracted, which explained 74.1% of the variance. Therefore, the EFA confirmed the unidimensionality of news media exposure.

Perceived Self-Relevance

Based on previous measurement of self-relevance to an issue (Chen & Ku, 2013; Frewer et al., 1997), perceived self-relevance in this study was measured by asking respondents the degree to which they agreed, on a 7-point scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*), with the following statements: (1) I have been aware of the hazardous influences of air pollution on my health and safety; (2) I have observed the negative consequences of air pollution on my everyday life quality; and (3) I have experienced the immediate hazards of air pollution to my health. The three items were averaged to create a composite index, with higher values demonstrating a higher degree of perceived self-relevance to the consequences of air pollution (M = 2.65, SD = 1.14, Cronbach's α = .72).

Perceived News Credibility

Although news coverage of air pollution has circulated through various media outlets, news content often overlaps, and it has consistently stressed the harm of air pollution on human health, especially since 2013, when severe air pollution occurred several times across China (Wong, 2013). Such a news ecology about the issue of air pollution warrants a global measurement of people's judgment of the credibility of the news from various media channels.

Referring to Kohring and Matthes's (2007) work, perceived news credibility in this study was measured as the respondents' evaluation of the general quality of news coverage of air pollution from various media channels through nine items in three aspects: (I) topic selectivity—namely, news coverage assigned (1) necessary attention, (2) adequate status, and (3) regular reporting to the topic; (II) fact selectivity—that is, news coverage (4) included essential points, (5) focused on important facts, and (6) covered different points of view; and (III) accuracy of depiction—that is, news coverage reported (7) verifiable, (8) correct, and (9) factual information. Respondents were asked to indicate, on a 7-point scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*), the extent to which they agreed with the above nine items. A principal factor analysis demonstrated that all the items were loaded on a single factor: the eigenvalue was 6.50, explaining 72.2% of the variance. Hence, a composite index was created by averaging these items, with higher scores indicating a higher level of perceived news credibility (M = 4.88, SD = 1.17, Cronbach's α = .95).

Perceived Health Risks

With reference to Slovic (1987) and Z. J. Yang, Rickard, Harrison, and Seo (2014), people's perceived health risks associated with air pollution were measured by asking respondents to indicate the extent to which they agreed with the following statements on a 7-point scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*): the hazards of air pollution to human health are (1) dreadful; (2) fatal; (3) uncontrollable; (4) not easily reduced; (5) risk increasing; (6) catastrophic; and (7) risky to future generations. These items were averaged to create an additive index, with higher values showing a higher level of perceived health risks (M = 5.48, SD = 1.04, Cronbach's α = .89).

Control Variables

Public trust in regulators has been demonstrated to attenuate public risk perceptions in health-related settings (Bearth, Cousin, & Siegrist, 2014; Poortinga & Pidgeon, 2005). Besides, perceived air quality directly influences individuals' perceived health risks, while perceived inequality of risk distribution serves as sociopsychological factor that affects perceived health risks (Slovic, 1987). Moreover, need for cognition, describing one's tendency to enjoy and engage in complex and critical thinking (Winter, Krämer, Rösner, & Neubaum, 2015), tends to influence the amount of cognitive effort an individual spends to process associated news coverage, thereby affecting the magnitude of media amplification of public risk perceptions. Accordingly, in addition to the demographic variables, these variables were also controlled for to test the hypotheses.

Trust in regulators was measured by asking respondents to indicate to what extent they had positive expectations in regulators' ability, benevolence, integrity, and transparency in protecting public well-being against air pollution hazards on a 7-point scale that ranged from 1 (*not at all*) to 7 (*very much*), with higher scores showing a higher level of trust in regulators (M = 4.05, SD = 1.39, Cronbach's α = .95). Perceived air quality was measured by a single item, asking respondents to indicate their general evaluations of the air quality of the region where they live on a 7-point scale from 1 (*very bad*) to 7 (*very good*), with higher values showing a better evaluation of the air quality (M = 4.04, SD = 1.54). For perceived inequality of risk distribution (see Slovic, 1987), respondents were asked to indicate the extent to which they agreed with the following statement, using a 7-point scale from 1 (*strongly disagree*) to 7 (*strongly agree*): air pollution hazards are unfairly distributed—namely, people with high socioeconomic status can avoid the hazards. Higher scores on this single-item index indicated a higher level of perceived inequality of risk distribution (M = 4.70, SD = 1.70). Need for cognition was measured by four items on a 7-point scale from 1 (*strongly disagree*) to 7 (*strongly agree*): (1) I prefer complex to simple problems; (2) I like to handle a situation that requires a lot of thinking; (3) I find satisfaction in deliberating long and hard; and (4) I enjoy doing things that are sure to challenge my thinking abilities (Winter et al., 2015). These items were averaged to create an additive index, with higher values showing a higher level of need for cognition (M = 4.91, SD = 1.07, Cronbach's α = .82).

Analysis

A simple linear regression using the SPSS 22.0 was used to test H1. The remaining hypotheses constituted a three-way interaction effect: The magnitude of the interaction effect of the independent variable and a moderator differs across the level of the other moderator. PROCESS, an SPSS macro developed by Andrew F. Hayes (2013), was employed to test H2 and H3. Compared with the three-way ANCOVA that requires categorical moderators, PROCESS allows researchers to test the moderating effects of continuous variables in one model, in which conditions are created based on the values of the mean and plus/minus one standard deviation from the mean of the moderators (Hayes, 2013). Moreover, compared with a hierarchical regression analysis, PROCESS implements the recommended asymptotic and bootstrapping methods to test hypotheses involving conditional effects in circumstances that have few requirements for model assumption (Preacher, Rucker, & Hayes, 2007). Accordingly, Model 3 in the PROCESS templates (Hayes, 2013) was used to test the three-way interaction effect in the current study.

Results

This study controlled for demographic variables, trust in regulators, perceived air quality, and perceived inequality of risk distribution to test H1. News media exposure was entered as the independent variable and perceived health risks as the dependent variable: $F(8, 1248)$ = 36.62, p < .001, adjusted R^2 = 18.5%. The regression analysis demonstrated that the frequency of news media exposure positively predicted the level of perceived health risks (β = .29, t = 11.02, p < .001). H1 was therefore supported. Among the control variables, monthly income (β = .10, t = 3.39, p < .01), trust in regulators (β = −.11, t = −3.83, p < .001), perceived air quality (β = −.19, t = −6.67, p < .001), and perceived inequality of risk distribution (β = .20, t = 7.62, p < .001) were all significantly correlated to perceived health risks.

Using PROCESS to test H2 and H3, trust in regulators, perceived air quality, perceived inequality of risk distribution, need for cognition, and demographic variables were entered as covariates. News media exposure was entered as the independent variable and perceived health risks as the outcome variable. Perceived self-relevance and perceived news credibility were entered as two moderator variables. Three conditions of each moderator variable were created: for perceived self-relevance, the mean (2.65), one standard deviation above the mean (3.79), and one standard deviation below the mean (1.51); for perceived news credibility, the mean (4.88), one standard deviation above the mean (6.05), and one standard deviation below the mean (3.71). Table 1 provides a summary of the regression model for predicting perceived health risks from the independent variable, moderator variables, and covariates.

Table 1. The Regression Model for Predicting Perceived Health Risks From the Independent Variable and Moderators.

Antecedents	B	SE	t	p
News media exposure (NME)	−0.37	0.12	−3.09	<.01
Perceived self-relevance (PSR)	−1.05	0.21	−5.10	<.001
NME × PSR	0.17	0.04	4.18	<.001
Perceived news credibility (PNC)	−0.37	0.15	−2.53	<.05
NME × PNC	0.09	0.03	3.45	<.001
PNC × PSR	0.09	0.05	1.88	.06
NME × PNC × PSR	−0.03	0.01	−2.76	<.01
Trust in regulators	−0.07	0.02	−3.13	<.01
Perceived air quality	−0.13	0.01	−7.34	<.001
Perceived inequality of risk distribution	0.05	0.01	3.96	<.001
Need for cognition	0.10	0.03	3.79	<.001
Gender	0.08	0.05	1.56	.12
Age	<−0.01	<0.01	−1.47	.14
Education	−0.06	0.04	−1.32	.19
Monthly income	0.05	0.02	3.18	<.01

$R^2 = 34.7\%$; $F(15, 1241) = 43.95$, $p < .001$

Note. Unstandardized regression coefficients were the default coefficients generated by PROCESS.

The results showed that the three-way interaction effect on perceived health risks was significant ($B = -0.03$, $SE = 0.01$, $p < .01$). To test H2, the interaction effect of news media exposure and perceived self-relevance on perceived health risks was significant ($B = 0.17$, $SE = 0.04$, $p < .001$). In conditions where the level of perceived self-relevance was high, the positive effects of news media exposure on perceived health risks were consistently stronger than in conditions where the level of perceived self-relevance was low (see Table 2). Hence, H2 was supported.

        To test H3a and H3b, the interaction effects of news media exposure and perceived news credibility on perceived health risks at values of perceived self-relevance were examined. In conditions where the level of perceived self-relevance was high, the interaction effect of news media exposure and perceived news credibility on perceived health risks was not significant: effect <-0.01, SE = 0.02, CI [−.04, .03]. By contrast, in conditions where the level of perceived self-relevance was low, the interaction effect of news media exposure and perceived news credibility on perceived health risks was significant: effect = 0.05, SE = 0.02, CI [.02, .09]. This evidence provided support for H3a.

        Notably, in conditions where the level of perceived self-relevance was low, the positive effect of news media exposure on perceived health risks was stronger in the condition where the level of perceived news credibility was high (effect = 0.21, SE = 0.04, CI [.13, .29]) than in the condition where the level of perceived news credibility was low (effect = 0.08, SE = 0.03, CI [.02, .15]; see Table 2). Hence, H3b was supported.

Table 2. Conditional Effect of News Media Exposure on Perceived Health Risks at Values of Perceived Self-Relevance and Perceived News Credibility.

Perceived self-relevance	Perceived news credibility	Boot effect	Boot SE	Boot LL 95% CI	Boot UL 95% CI
1.51	3.71	0.08	0.03	.02	.15
1.51	4.88	0.15	0.03	.08	.21
1.51	6.05	0.21	0.04	.13	.29
2.65	3.71	0.17	0.03	.12	.23
2.65	4.88	0.20	0.03	.15	.25
2.65	6.05	0.23	0.03	.16	.30
3.79	3.71	0.26	0.04	.19	.34
3.79	4.88	0.26	0.04	.19	.33
3.79	6.05	0.25	0.05	.16	.35

Note. Bootstrap sample size = 10,000. LL = lower limit; CI = confidence interval; UL = upper limit.

        In addition to the statistical results of the conditional effect of news media exposure on perceived health risks at values of perceived self-relevance and perceived news credibility presented in the tables, Figure 2 illustrates this three-way interaction effect.
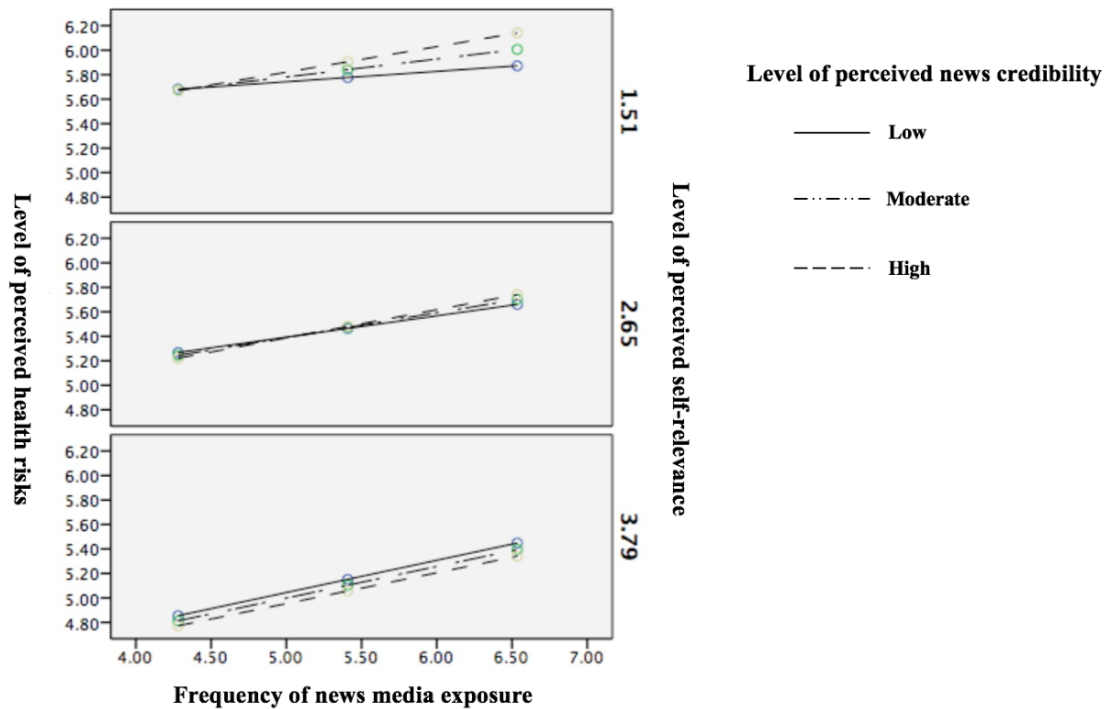
Figure 2. A chart of the three-way interaction effect on perceived health risks.

Discussion

Interpreting the Conditional Media Effect Approach

As stated in H1, the more frequently individuals were exposed to news coverage of air pollution, the stronger their perceived health risks were. This finding supports and validates media amplification of public risk perceptions (J. Huang & Yang, 2019; Kasperson et al., 2003; Smith & Fischbacher, 2009). Interestingly, news media as an amplifier of public risk perceptions suggests some features of the Chinese media system. The censorship in China had silenced the majority of media critiques about regulators' underperformance in mitigating air pollution in the first few years after air pollution first attracted nationwide attention around 2010 (Kay et al., 2015; Wildau, 2015). However, to transform air pollution management into a prioritized social agenda, to raise public awareness of self-protection, as well as to promote proenvironmental behaviors, news media have been emphasizing air pollution hazards instead, which is less likely to be censored. Such a strategy echoes that Chinese news media have been trying to strike a balance between professionalism and political pressure (H. C. Li, forthcoming; Lin, 2010; Tong, 2009).

Consistent with H2, the moderating role of perceived self-relevance between news media exposure and perceived health risks indicates some level of selective exposure motivated by reinforcement seeking. Put differently, motivated by the tendency to reinforce established opinions (Garrett, 2009), people who believed that air pollution had negatively affected their everyday life tended to exhibit a preference for information that emphasized air pollution hazards during their exposure to news coverage.

The support for H3a suggests the limited role of individuals' critical judgment in media amplification of public risk perceptions. When people perceived high levels of self-relevance to air pollution hazards, their negativity bias to follow risks-related news dominated their intention of selective exposure (see Garrett, 2009; Meffert et al., 2006). In such circumstances, people's negative emotions—such as worry, anxiety, and fear—were very likely to be elicited (Paivio & Laurent, 2001). The negativity bias and negative emotions thereby impeded individuals' cognitive capability to critically judge the news content based on credibility. However, the support for H3b indicates that for people who perceived low levels of self-relevance, their cognitive ability was less likely to be weakened. Therefore, motivated by the need to obtain a comprehensive and accurate understanding of public issues (Katz, Blumler, & Gurevitch, 1973; Lee & Ma, 2012), people could employ their cognitive resources to judge news credibility before developing certain risk perceptions.

To sum up, the support for all the hypotheses validates the conditional media effect approach to understanding media amplification of public risk perceptions. In response to the prevalent influence of news media, individuals are no longer passive message recipients whose risk perceptions are directly and unconditionally shaped by mass media activities (e.g., Ackerson & Viswanath, 2010; Bakir, 2006; Frewer et al., 2002; H. Kim et al., 2019). Instead, individuals have some level of agency to select from a plethora of news coverage and selectively pay attention to risks-related information, based on judgment of self-relevance. Nevertheless, they do not necessarily make critical judgment of news credibility during their selective exposure. Taken together, these findings indicate a tension between news media influence and individual agency—that is, news media have been trying to shape public risk perceptions, whereas individuals have started to counterbalance this influence during news media exposure.

Limitations and Future Research

First, this study focuses on the individual stations, a fundamental component of SARF, to test how individuals' exposure to news coverage amplified their risk perceptions about air pollution, while the rippling effect and subsequent social impacts were not tested. Given that SARF is a comprehensive conceptual framework that aims to explicate the process and consequences of social amplification of public risk perceptions (Kasperson et al., 2003; Kasperson et al. 1988), future studies could combine the individual aspect with the social aspect of SARF and simultaneously take into account psychological, cultural, and institutional factors to examine the rippling effect and subsequent social impacts resulting from news media exposure.

As an online survey was employed to illustrate the conditional media effect approach, the degree of individuals' elaborative processing of the news was inferred, rather than being experimentally manipulated and then measured. However, compared with previous studies that used hypothetical events to examine the elaboration continuum in experimental settings (e.g., Briñol, Petty, & Tormala, 2004; Lazard

& Atkinson, 2015; Tormala, Briñol, & Petty, 2007), surveying respondents' views about air pollution, a real-life environmental problem, increased the external validity of the findings. Nevertheless, a cross-sectional survey cannot claim causal relationships among the examined variables. To overcome these limitations, future research could use field experiments to causally test the conditional effect of exposure to a specific news program or mediated campaign about environmental health issues on people's perceived health risks, as well as to measure the degree of individuals' elaborative processing of these media messages.

In terms of the measurement of examined variables, the current study measured one important dimension of perceived self-relevance—namely, how individuals experienced and perceived the consequences of air pollution to their health. Given that self-relevance to an issue can also be judged in terms of how the issue is related to certain domains of people's lives (Bhattacherjee & Sanford, 2006; Bordia, DiFonzo, Haines, & Chaseling, 2005; Petty & Cacioppo, 1986), future research could measure this variable by asking respondents to indicate how they experience and perceive the impact of air pollution on their economic conditions and on their family members' health, to increase the measurement validity.

Lastly, according to the 2010 Chinese census data, the sample in this study was not fully representative of the Chinese population in its demographic variables. However, considering that the issue of air pollution has mainly attracted attention and comments from younger, more educated, and more affluent people (Kay et al., 2015), the results are informative. Future research should use other similar environmental health issues to cross-validate the conditional media effect approach to media amplification of public risk perceptions.

Conclusion

In conclusion, this study puts forward the conditional media effect approach to explicate how people's perceived health risks about air pollution are amplified during their news media exposure. This approach illuminates the mechanism of the individual stations and highlights the individual aspect of SARF, thereby extending the body of SARF knowledge that has previously prioritized the framework's social aspect (e.g., Bakir, 2005; Chung, 2011; Harrison et al., 2008; Zhang et al., 2017). Moreover, the emphasis on the individual aspect of SARF echoes the call in recent years to move from massive and uniform to individual and contingent media effects (see Tsfati, 2017), which suggests that individuals have increasing agency to act as active message receivers to counterbalance the ubiquitous media influence.

The conditional media effect approach also has some practical implications. In mediatized societies where people's perceptions about social issues are largely shaped by media messages (Livingstone, 2009), media amplification of public risk perceptions is nearly inevitable. Given that a majority of laypeople tend to selectively consume risk-related media messages without enough critical judgment of news credibility, news producers and policy makers should take measures to avoid overamplified public risk perceptions for effective risk management. On the part of news producers, journalists are advised to consult multiple stakeholders and cover the story in a balanced way, while editors should reasonably play the role of gatekeeping to guarantee that news coverage will not lead to polarized public opinions. Meanwhile, policy makers could use online platforms to have transparent and timely dialogues with the public to address their concerns and to keep them informed of the latest

progress of risk management. These insights not only apply to the issue of air pollution in China but also to a range of similar environmental health issues in other countries.

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