Risk Management and Healthcare Policy

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ORIGINAL RESEARCH

How Does Psychological Distance Influence Public Risky Behavior During Public Health Emergencies

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Background: Public health emergencies not only threaten the physical and mental health of the public but also trigger a series of risky behaviors of the public, which in turn lead to the emergence or intensification of risk events, disrupting existing economic and social order.

Purpose: Based on construal level theory, cognitive appraisal theory of emotions and mood maintenance hypothesis, the study aims to investigate the collectively effect of risk perception and psychological insecurity in the connection between psychological distance and public risky behavior.

Participants and Methods: Cross-sectional data was derived from 257 China urban residents. All participants finished the psychological distance scale, risk perception scale, psychological insecurity scale, and risky behavior scale. The research hypothesis was tested using the PROCESS macro.

Results: The direct impact of psychological distance on risky behavior was not significant ($\beta=-0.018$, $p>0.05$). The indirect impact of psychological distance on risky behavior was significant. In other words, the impact of psychological distance on risky behavior was serially mediated via risk perception and psychological insecurity ($\beta=0.011$, 95% CI= [0.0013, 0.025]).

Conclusion: Risk perception and psychological insecurity play serial mediating roles in the relationship between psychological distance and public risky behavior. We conclude that during public health emergencies, public health managers should pay extra attention to the risk perception and psychological insecurity level of the public with closer psychological distance, take measures to reduce their risk perception, enhance their psychological security, and reduce their risky behavior, thereby ensuring the physical and mental health of the public and maintaining the stability of economic and social order.

Keywords: public health emergencies, psychological distance, risk perception, psychological insecurity, risky behavior

Introduction

Public health emergencies refer to events that seriously damage peoples' health, including major infectious disease epidemics, mass diseases of unknown origin, and major food and occupational poisonings. 2003 SARS, 2014 Ebola epidemic in West Africa, 2020 COVID-19 and 2023 monkeypox epidemic are typical public health emergencies. Such events are characterized by suddenness, instability, uncertainty, mass and infectivity,[1,2] which endangers peoples' physical and mental health as well as induces a series of risky behaviors among the public. For example, panic buying behaviors (such as daily necessities, medical supplies, and food), illegal and criminal behaviors (such as spreading rumors, conspiracy theories, extortion, and violence), self-destructive behaviors (such as excessive drinking, drug abuse, and commit suicide), unhealthy behaviors (such as smoking, sedentary, and a decline in daily physical activity), and boycott epidemic prevention and control behaviors (such as mass gathering of entertainment, deceiving the disease, retaliatory tourism and leisure, participating in activities with a large number of people, and fleeing epidemic areas).[3–8] These risky behaviors will further endanger peoples' physical and mental health, induce the occurrence or aggravation of risk events, disrupt existing economic and social order, and then threaten social stability and national security if not

Received: 9 January 2024
Accepted: 13 May 2024
Published: 31 May 2024

controlled and eliminated in time.[9] Therefore, understanding the intricate causes and process mechanisms of risky behaviors among the public during public health emergencies is of utmost importance and needs to be done promptly.

Throughout previous literature, public risky behaviors during public health emergencies have been proven to be related to demographic characteristics,[5,10] personality traits,[11] risk perception,[10] emotions,[3] health literacy,[12] information sources, and the scope of information dissemination.[13] However, people's construct of the same event will be different due to different psychological distances, which in turn can affect their subsequent risky choice.[14] As pointed out by Yang et al, the closer the psychological distance perceived by the public in the context of climate change, the more willing they are to adopt citizens green behavior.[15] Sharma et al confirmed that the psychological distance between customers and sellers on eBay is a critical factor that leads to customers' fraudulent behavioral intention (that is falsely claiming not to have received goods purchased from eBay).[16] Wu et al found that the closer the individual psychological distance of climate change, the more useful knowledge and information they can actively acquire, and improve their climate change communication behavior.[17] In a study by Chen et al, psychological distance can affect people's judgment of immoral behavior.[18] Recently, psychological distance has been widely applied in various public health events, such as Ebola outbreak,[19] Zika outbreak,[20] and COVID-19.[21] Therefore, it is indispensable to explore the influence of psychological distance on public risky behavior under public health emergencies.

By further reviewing the literature, firstly, we found that empirical studies on public risky behaviors during public health emergencies mainly focuses on panic buying behaviors (such as masks, alcohol, antiviral drugs, vegetables, and fruits),[22] illegal and criminal behaviors (such as assault, battery, theft, property crime, fraud, drug crimes, extortion, and homicides),[23–25] self-destructive behaviors (such as excessive drinking, self-harm, and commit suicide),[6,26] and unhealthy behaviors (such as smoking, sedentary, and a decline in daily physical activity),[7] while empirical studies on boycott epidemic prevention and control behaviors of the public are relatively scarce.[27] Secondly, we found that few studies have explored the effect of psychological distance on public risky behavior under public health emergencies, but most of them have examined the effect of psychological distance on public protection/prevention behavior. For example, Sang et al found that during public health emergencies (similar to a closer temporal distance), the public tends to engage in unhealthy behaviors (such as sedentary, and a decline in daily physical activity).[7] This conclusion was also confirmed by Dai et al and Fan et al.[6,8] As mentioned by Liu et al, the closer the psychological distance from COVID-19, the stronger the fear of COVID-19, then leading to safety behaviors (i.e. hand washing) and low-carbon behaviors.[28] Blauza et al also mentioned that the lower level of psychological distance from COVID-19, the greater the willingness to comply with proactive behaviors.[21] Finally, we also found that in the study of the influence of psychological distance on behaviors in different fields (such as marketing, trade, and environment), scholars mostly explore the process mechanism of cognitive and emotional variables in the relationship between the two, and most of them examine the role of a single variable, ignoring the role of multiple variables. For example, Azadi et al found that the three dimensions of psychological distance (that is temporal, social and hypothetical distance) can affect risk perception, which in turn affect smallholders' adaptation behavior.[29] Lee and Li mentioned in their study that closer spatial distance can effectively induce empathy, thereby encouraging subsequent prosocial behaviors (i.e. volunteering and donating).[30] Although Yang and Dong examined the relationship among psychological distance, risk perception, emotional response, and vaccination intention during monkeypox outbreak, they did not examine whether risk perception and emotional response can play a joint mediating role between psychological distance and vaccination intention.[31] Based on the above gaps and limitations, the risky behavior in this paper mainly adopts boycott epidemic prevention and control behaviors (such as mass gathering of entertainment, tourism and leisure, and participating in activities with a large number of people), and examines whether psychological distance influence public risky behavior under public health emergencies, and the complex process mechanism of cognitive and emotional variables in the relationship between the two.

Construal level theory suggests that people's psychological distance (including temporal distance, spatial distance, social distance, and hypothetical distance) from specific objects or events can affect their response.[32] In other words, the construal level can be considered to be people's cognition and understanding of the specific object or event, which constitutes the basis of the evaluation and behavior results of a series of psychological distance events.[22] The closer the psychological distance, the more concrete the construal level; the further the psychological distance, the more abstract the construal level.[33] At present, this theory has been widely applied in the study of the relationship between psychological

distance and public perception or behavior.[22,34] Therefore, based on construal level theory, we believe that the closer the psychological distance from public health emergencies, the more concrete people's perception of the event, and they may be more willing to take measures to protect themselves and reduce their risky behaviors. At the same time, due to the more concrete people's construct of the event, they may feel psychologically close to it, thus increasing their risk perception of the event. Cognitive appraisal theory of emotions emphasizes that cognition can influence behaviors by inducing emotions.[35] Positive cognition tends to produce positive emotions, while negative cognition contributes to negative emotions, and different emotions then affect subsequent behaviors.[36] At present, this theory has been widely applied in the study of the relationship among public perception, emotions, and behaviors.[37] Therefore, based on construal level theory and cognitive appraisal theory of emotions, we believe that psychological distance may affect public emotions through risk perception, and then affect subsequent related behaviors. In other words, more concrete mental construal associated with closer psychological distance in public health emergencies may lead to higher risk perception, induce strong emotional reactions, and thus affect public behaviors. Since psychological insecurity can be an emotional response to both sudden threat stimulus or relatively persistent threat stimulus,[38] and current studies have also confirmed that increased risk perception can lead to lower psychological security of the public.[39] Hence, we believe that psychological distance may affect public psychological insecurity through risk perception, and then affect subsequent related behaviors. Mood maintenance hypothesis states that people in negative affect/emotions tend to choose risky behaviors.[40] Since psychological insecurity is an emotional response that occurs when people encounter external stimuli, and it has been confirmed by previous studies that high psychological insecurity can trigger negative coping behaviors.[41,42] Therefore, based on construal level theory, cognitive appraisal theory of emotions, and mood maintenance hypothesis, we believe that psychological distance may affect public psychological insecurity through risk perception, and then affect public risky behavior.

In a word, based on construal level theory, cognitive appraisal theory of emotions and mood maintenance hypothesis, the theoretical model of the effect of psychological distance on public risky behavior incorporates risk perception and psychological insecurity. A joint mediation model was developed to illustrate the influence of psychological distance on public risky behavior via risk perception and psychological insecurity. In this study, the main contribution is not only to examine the public boycott epidemic prevention and control behavior under public health emergencies, enriching empirical research on public risky behavior, but also to examine for the first time the impact of psychological distance on public risky behavior under public health emergencies, and to verify the complex process mechanism of cognitive and emotional variables in the relationship between the two, breaking the previous mediating idea of studying single variable and expanding the deep mechanism of the formation of public risky behavior under public health emergencies. This study is not only crucial for ensuring the physical and mental health of the public and preventing the rapid spread of diseases, but also has important enlightening significance for public health managers to develop scientific and effective intervention plans and emergency measures, maintain economic and social order, and thus maintain social stability and national security.

Theoretical Background and Hypotheses

Construal Level Theory

Construal level theory originates from time construal theory, which emphasizes that temporal distance affects the individual level of construct, which in turn affects their cognition and behavior.[43,44] Construal level theory extends psychological distance from a single dimension (temporal distance) to multiple dimensions (temporal distance, spatial distance, social distance, and hypothetical distance).[45] Among them, temporal distance represents the disparity in time (either in the past or future) between the individual present time and the target event. Spatial distance represents the physical distance between the individual and the target event. Social distance represents the degree of differentiation between social objects and individuals. Hypothetical distance represents the probability of the target event occurring or the degree of closeness to reality. According to the theory of construal level, there is a connection between psychological distance and different construal's of the target event.[45] An event can be considered either psychologically close or psychologically distant. As decreases in psychological distance, objects or events are considered more concrete, reliable,

detailed, and visible.[33] As increases in psychological distance, objects or events are considered more abstract, simpler, and have lower credibility.[33]

Cognitive Appraisal Theory of Emotions

Cognitive appraisal theory of emotions deems that people's responses to events follow the rule of cognition-emotion-behavior,[36] that is, the individual will experience different emotions in short-term or continuous cognitive evaluation of events or situations, and then guide subsequent behaviors.[35,46] Among them, positive cognition tends to produce positive emotions, while negative cognition contributes to negative emotions.[36] Cognitive appraisal theory of emotions also points out that specific emotion types can be judged according to different combinations of dimensions such as certainty, goal consistency and coping potential.[47] Certainty refers to the probability of occurrence of the target event. Goal consistency refers to the degree to which the target event leads the individual to achieve their expected goals. Coping potential refers to the individual ability to control the target event.

Mood Maintenance Hypothesis

Mood maintenance hypothesis stems from studies of affect/emotions and risky behavior. This hypothesis suggests that compared with individual in a moderate emotional state, those in a positive emotional state tend to avoid taking risks to maintain their current positive emotions to the greatest extent, while those in a negative emotional state tend to choose taking risks in an attempt to change the status quo (that is change negative emotional state) or seek benefits (that is seek positive emotional state).[40,48]

Psychological Distance and Risky Behavior

Psychological distance shows the distance of oneself from a target event temporally, spatially, socially and/or hypothetically.[28] Risky behavior indicates various behaviors that are not controlled by behavioral rules after the individual experience complex psychological reactions in stressful situations. Its characteristics are blindness, impulsiveness, and malice, highlighting negativity and destructiveness.[4,27] Based on construal level theory, the closer the psychological distance from public health emergencies, the less conducive it may be to the public's risky behavior. More concretely, as decreases in psychological distance, the information from public health emergencies is considered more concrete and detailed,[33] and the individual will pay more attention to the consequences of the event. Therefore, individual will cooperate with the government's epidemic prevention and control policies via reducing their own risky behaviors.[28] In contrast, as increases in psychological distance, the information from public health emergencies is considered more abstract and high-level, which can activate people's uncertainty and ambiguity about public health emergencies,[33] inevitably increasing their risky behaviors. Although very few research works have been performed to examine the influence of psychological distance on risky behavior, the study found that the closer the psychological distance is, the more it promotes people's climate change mitigation behavior.[49] The individual with high level of psychological distance from COVID-19 no longer actively concerned about COVID-19 and will adopt a passive approach to participate in the fight against the epidemic,[33] which can indirectly confirm the inference of this study. Hence, hypothesis 1 is proposed.

Hypothesis 1: psychological distance is positively related to risky behavior.

The Joint Mediation Effect of Risk Perception and Psychological Insecurity

Risk perception refers to the individual tendency to rely on personal subjective intuitionistic judgment to make cognitive assessment of the risks of various dangerous things in the situation.[50] Psychological insecurity can be an emotional response to a sudden threat stimulus or a relatively persistent threat stimulus.[38] Based on construal level theory, the closer the psychological distance from public health emergencies, the higher the risk perception of the public should be. More concretely, the closer the psychological distance, the smaller the deviation between individual cognition and actual situation, the lower the level of construct of events,[33] the more information related to events can be obtained from multiple aspects, and think that the current situation is not optimistic,[13] so the public will have a higher risk perception. On the contrary, when it is perceived as psychologically far away, the greater the deviation between individual cognition and actual situation, the higher the level of construct of events. People will think that the event is psychologically distant,

with less consideration for concrete and detailed situations,[31,33] and the public will have a lower risk perception. The inference of this paper is also supported by previous studies. For instance, Huang et al found that the closer the psychological distance, the higher the level of online users' risk perception.[13] Yang and Dong found that the closer the temporal and social distance from the monkeypox epidemic, the higher the level of risk perception.[31] Hence, hypothesis 2 is proposed.

Hypothesis 2: psychological distance is negatively associated with risk perception.

Based on cognitive appraisal theory of emotions, the level of public risk perception should promote their psychological insecurity. To be more specific, risk perception under public health emergencies emphasizes the uncertainty of the risk of the event, and the public has a lower sense of control over the event, such as being easily infected by viruses, disrupting normal life order. This will inevitably lead to higher negative emotions and lower controllability among the public,[47] thereby enhancing their psychological insecurity. Previous literature also supports the inference of this paper. For example, in a study of Ebola epidemic, Yang mentioned that the risk perception related to the Ebola virus will trigger more fear.[51] Zhao et al highlighted in their study on COVID-19 that heightened public risk perception can result in a decreased sense of security.[39] In a study of monkeypox, Yang and Dong found that the higher the peoples' risk perception of monkeypox, the more likely it is to arouse negative emotions.[31] In the field of behavioral studies, emotions are a key determinant of human behavior.[42,52] On the base of cognitive appraisal theory of emotions and mood maintenance hypothesis, risk perception induced psychological insecurity should trigger a series of risky behaviors. More precisely, peoples' high psychological insecurity can stimulate their motivation to pursue psychological security, so they tend to choose to take risks to try to change the status quo, that is, reduce their own psychological insecurity and enhance their psychological security. Previous literature also supports the inference of this paper. For instance, negative emotions can lead to increased risky behavior (i.e. non-suicidal self-injury).[52] Chen et al found that high emotional insecurity levels of junior middle school students are more likely to develop aggressive behavior.[41] Wu et al found that job insecurity can lead to emotional exhaustion, thereby causing employees to engage in unsafe behaviors.[42] In summary, hypothesis 3 and hypothesis 4 are proposed.

Hypothesis 3: risk perception is positively correlated with psychological insecurity.

Hypothesis 4: psychological insecurity is positively associated with risky behavior.

Based on the above inferences and hypotheses, this paper further infers that psychological distance should have an impact on public risky behavior via risk perception and psychological insecurity. Hence, hypothesis 5 is proposed.

Hypothesis 5: risk perception and psychological insecurity will joint mediate the impact of psychological distance on risky behavior.

The theoretical model of our article was depicted in Figure 1.

Materials and Methods

Participants

The public health emergencies in this article take the COVID-19 as an example. The data was collected during the COVID-19 pandemic in 2022. Researchers posted information online to recruit urban residents, and adopted snowball sampling method. Recruited urban residents further search for their friends, colleagues, relatives, and so on, like a snowball rolling from less to more. Urban residents must be over 18 years old and have no intellectual disabilities or dyslexia to be included in this survey. The urban residents recruited were mainly located in Shandong, China. Researchers informed the purpose, general content, and importance of the study to participants, and ensured that the test was anonymous and confidential. Based on this, we hope to counteract the participants' tendency towards response bias, which includes providing incorrect answers, conforming to social desirability, and consistently giving the same response. Then, demographic information and questionnaires (such as

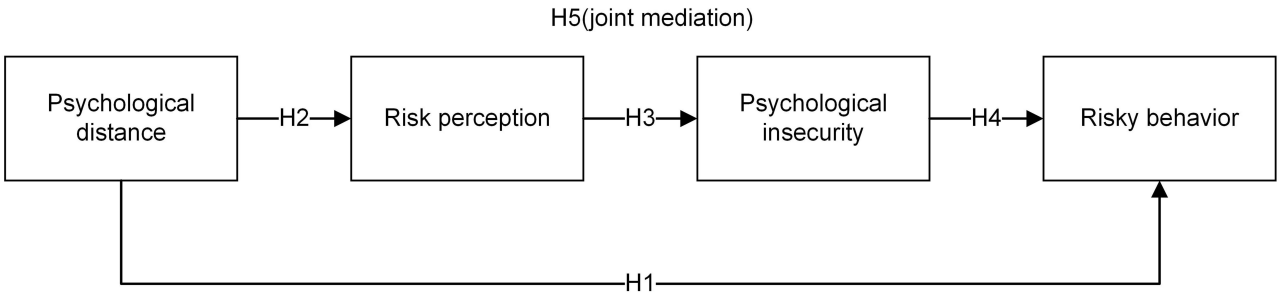

Figure 1 The theoretical model.

psychological distance, risk perception, psychological insecurity, and risky behavior) were generated by Wenjuanxing platform. To effectively address the participants' response bias, the questionnaire was designed to include items that would help identify any potential bias in their responses (such as "to guarantee the accuracy of the response, please select 'totally agree' for this item"). Furthermore, this article compared the differences in gender and age variables between early participants (top 25%) and late participants (bottom 25%), and the chi-square test results showed that the differences were not significant ($p>0.05$), indicating that non-response bias did not have a serious impact on this article. Completing the questionnaire and submitting it online is synonymous with obtain the informed consent. The duration of the data collection was around two months. In the end, invalid questionnaires were excluded (i.e. incorrect response bias identification item, regular responses, and identical response options), resulting in 257 valid questionnaires (N_{male}=56%, N_{female}=44%, $N_{age<25}$=36.6%, $N_{age\geq25}$=63.4%).

Measures

The tool used in this paper was selected after reviewing previous research literature related to public health emergencies and screening scales with good reliability and validity tests. Afterwards, we conducted data collection.

This is a four-item scale that assesses psychological distance from COVID-19.[28] An item includes "Each of us has the potential to become infected". The Cronbach's alpha of psychological distance in our research was 0.721. The larger the measured value is, the closer the psychological distance is.

This is a six-item scale that measures risk perception.[53] The risk perception value is the product term of two dimensions, that is perceived severity and susceptibility of risks associated with COVID-19. A sample item includes "In my opinion, COVID-19 is a serious health issue". The Cronbach's alpha of risk perception in our research was 0.748.

This is a fifty-three-item scale that assesses psychological insecurity.[54] Two items includes "Anger", "Panic". The Cronbach's alpha of psychological insecurity in our research was 0.981.

This is an eight-item scale measuring risky behavior that the public may engage in during the COVID-19 pandemic.[27] A sample item includes "Attending events with large crowds". The Cronbach's alpha of risky behavior in our research was 0.799.

Control Variables

Gender and age were utilized as control variables as gender and age have been shown to relate to risky behavior.[10]

Analysis

In this study, data analysis using Mplus 8.3 and SPSS 24.0. Firstly, Mplus was used to conduct confirmatory factor analysis on the questionnaire. Secondly, common method bias test, descriptive statistics, and Pearson product difference correlation analysis were conducted on each research variable. Finally, SPSS PROCESS macro was used to test the hypothesis. SPSS PROCESS macro, developed by Hayes,[55] is specifically designed to handle single, multiple series or parallel mediating variables, moderating variables, and report bootstrap confidence intervals and mediating effect sizes. This function helps achieve expected goals and has been widely applied in the study of variable relations.[53,56,57]

Results

Confirmatory Factor Analysis

Table 1 summarizes the results obtained from conducting confirmatory factor analysis on the questionnaire using Mplus 8.3. As the original four-factor model did not yield satisfactory fit data, we made adjustment to the model using the modification indices provided by the software.[58] The modified four-factor model resulted in good fitting data (χ^2/df=1.991, p<0.001, RMSEA=0.062, CFI=0.892, TLI=0.883, SRMR=0.070), and the four-factor construct is clearly superior to other constructs. This signifies that the questionnaire exhibits good discriminant validity.

Common Method Bias Test

To examine the common method bias, we carried out Harman's single-factor test. The findings indicate that the initial principal component pre-rotation accounted for 39.840%, falling below the critical threshold of 50%,[59] showing that this paper was not concerned with common method bias.

Descriptive Statistics and the Correlation Between Variables

Table 2 displays the means, standard deviations, and the Pearson product-moment correlation coefficient for each variable. As shown in Table 2, psychological distance was correlated with risk perception (r=0.564). Psychological distance was not associated with both psychological insecurity and risky behavior. Risk perception was correlated with both psychological insecurity (r=0.129) and risky behavior (r=0.160). Psychological insecurity was correlated with risky behavior (r=0.251).

Hypothesis Testing

We applied Model 6 in PROCESS macro developed by Hayes to conduct hypothesis testing,[55] and virtualized the control variables (gender, age) that entered the equation (0, 1). Then, we employed the bootstrapping method to perform 5000

Table 1 Confirmatory Factor Analysis

Factors	χ^2	df	RMSEA	CFI	TLI	SRMR
One-factor model: PD+RP+PIS+RB	11020.163	2414	0.118	0.592	0.579	0.088
Two-factor model: PD, RP+PIS+RB	10801.609	2413	0.116	0.602	0.590	0.086
Three-factor model: PD, PIS, RP+RB	7243.623	2369	0.089	0.769	0.757	0.100
Four-factor model: PD, RP, PIS, RB	6647.788	2359	0.084	0.800	0.790	0.079

Note: N=257.
Abbreviations: RMSEA, root-mean-square error of approximation; CFI, comparative fit index; TLI, Tucker-Lewis index; SRMR, standardized root mean square residual; PD, psychological distance; RP, risk perception; PIS, psychological insecurity; RB, risky behavior.

Table 2 Results of Descriptive Statistics and the Correlation Between Variables

Variables	M	SD	1	2	3	4
1. Psychological distance	4.819	1.315	–			
2. Risk perception	10.811	5.270	0.564***	–		
3. Psychological insecurity	1.570	0.664	0.019	0.129*	–	
4. Risky behavior	1.579	0.661	0.051	0.160*	0.251***	–

Note: N=257, *p<0.05, ***p<0.001.
Abbreviations: M, mean; SD, standard deviation.

Table 3 Results of Hypothesis Testing

Variables	Effect	S.E.	95% CI
Psychological distance → Risky behavior	−0.018	0.037	[−0.089,0.055]
Psychological distance → Risk perception	2.264	0.207	[1.854,2.673]
Risk perception → Psychological insecurity	0.022	0.009	[0.003,0.040]
Psychological insecurity → Risky behavior	0.226	0.061	[0.107,0.346]
Psychological distance → Risk perception → Psychological insecurity → Risky behavior	0.011	0.006	[0.0013,0.025]

Note: N=257.
Abbreviations: S.E., standard errors; CI, confidence interval.

repeated samplings. This enabled us to obtain the standard error and 95% confidence interval of the parameter estimation to test a series of research hypotheses.

As shown in Table 3, psychological distance was not significantly correlated with risky behavior ($\beta=-0.018$, $p>0.05$). Hypothesis 1 was not verified. There was a positive correlation between psychological distance and risk perception ($\beta=2.264$, $p<0.001$). Due to the larger the psychological distance value in this paper, the closer the psychological distance, hypothesis 2 was verified. Risk perception was positively related to psychological insecurity ($\beta=0.022$, $p<0.05$). Hypothesis 3 was verified. There was a positive correlation between psychological insecurity and risky behavior ($\beta=0.226$, $p<0.001$). Hypothesis 4 was verified. The combination influence of risk perception and psychological insecurity on the connection between psychological distance and risky behavior was found to be 0.011, and its 95% confidence interval was [0.0013, 0.025], which does not include 0, showing that psychological distance can affect public risky behavior via risk perception and psychological insecurity. Hypothesis 5 was verified.

Discussion

Based on construal level theory, cognitive appraisal theory of emotions and mood maintenance hypothesis, this paper constructed a theoretical model of the impact of psychological distance on public risky behavior with risk perception and psychological insecurity as a series of mediating variables. 257 urban residents were selected as the research participants and the theoretical model was tested by PROCESS macro. The results support most hypotheses: psychological distance was not significantly correlated with risky behavior. Psychological distance was positively associated with public risk perception. Risk perception was positively related to public psychological insecurity. Psychological insecurity was positively connected with public risky behavior. The relationship between psychological distance and risky behavior were serially mediated via risk perception and psychological insecurity.

Theoretical Implications

This paper mainly conducts empirical research on the public boycott epidemic prevention and control behaviors under public health emergencies, enriching the research content of previous public risky behaviors. Currently, empirical studies have been conducted on risky behaviors such as panic buying behaviors,[22] illegal and criminal behaviors,[23–25] self-destructive behaviors, and unhealthy behaviors during public health emergencies.[6,7] However, empirical studies on boycott epidemic prevention and control behaviors under public health emergencies are still relatively scarce. Given that the data collection period in this paper coincides with a nationwide outbreak of public health emergencies and a period of strict government prevention and control, risky behaviors such as mass gathering of entertainment, tourism and leisure, participating in activities with a large number of people have emerged in society.[4] Therefore, this paper focuses on the study of boycott epidemic prevention and control behaviors of the public under public health emergencies, enriching the research content of previous risky behaviors.

This paper applies construal level theory for the first time and introduces the psychological distance variable to examine public risky behavior under public health emergencies, expanding the antecedent variables of previous studies

on public risky behavior. Although studies have shown that during public health emergencies (similar to a closer temporal distance), the public may engage in unhealthy behaviors (such as sedentary, and a decline in daily physical activity),[7] the construal level theory extends psychological distance from a single dimension (temporal distance) to multiple dimensions (temporal distance, spatial distance, social distance, and hypothetical distance).[45] Therefore, this paper examines the impact of multiple dimensions of psychological distance on risky behavior, filling the gap in previous research. Due to different levels of construct, people often respond differently to stimuli that are psychologically close or distant.[45] As psychological distance increases, the construct of stimulus becomes more abstract, while as psychological distance decreases, the construct of stimulus becomes more concrete. However, the findings from this study indicate that there was no significant direct impact of psychological distance on risky behavior, which fails to prove the research hypothesis of this paper. However, according to the perspective of public coping behavior under climate change, when the individual view climate change as a serious threat, they may not know how to deal with it and do not believe that individual behavior can change the status quo, so they may avoid taking actions. Even the close psychological distance to the event cannot stimulate people's autonomous motivation to take actions.[60,61] As the severe outbreak of public health emergencies in China during the data collection period, this paper believes that it may be due to people's awareness of the dangerous and threatening nature of public health emergencies, and their own actions are too difficult to change the situation. Therefore, lower psychological distance level does not have a significant impact on public risky behavior.

This paper integrates construal level theory, cognitive appraisal theory of emotions and mood maintenance hypothesis for the first time, deeply revealing the complex process mechanism by which psychological distance affects public risky behavior. Existing research has primarily focused on assessing the single influence of cognitive and emotional variables in the connection between psychological distance and public coping behavior. Unfortunately, these studies have neglected to explore the involvement of serial mediators, resulting in an inadequate understanding of the underlying mechanism responsible for the development of public risky behavior. Based on construal level theory, cognitive appraisal theory of emotions and mood maintenance hypothesis, this paper surmounts the notion of single-variable mediation in prior studies, and builds a theoretical model of "psychological distance – risk perception – psychological insecurity – risky behavior" and verifies it. The results show that psychological distance can influence risky behavior through risk perception and psychological insecurity. This means that a closer psychological distance from public health emergencies, only when it stimulates or threatens the public's own cognition and emotions, will it affect their subsequent risky behavior.

Practical Implications

This paper found that the closer the psychological distance from public health emergencies, the higher the public's risk perception and psychological insecurity, which in turn may lead to public risky behavior. Therefore, after the occurrence of public health emergencies, in order to reduce the risky behavior of the public who perceive a low level of psychological distance from public health emergencies, government managers should pay attention to reducing the public's risk perception and enhancing their psychological security. For example, the public can be encouraged to use their free time for acquiring new skills, enrich their spare time and leisure life, and reduce emotional exhaustion. Further establish a sound mental health service system in communities and streets, cultivate the public's good emotional regulation ability, and alleviate their own sub-health status. Maintain the normal order of production and life of the public, and implement multi-level targeted approach to epidemic prevention and control, and avoid a one-size-fits-all approach. Stable income, promoting flexible employment for the public, maintaining normal economic and social order. We hope that this can help reduce public risk perception and enhance public psychological security.

Limitations and Future Research

The study also has some areas that need further improvement. The study only employs a cross-sectional design and cannot identify causal relationships between variables. However, previous research has shown that a cross-sectional design can be employed in cases where the anticipated relationships between variables are still uncertain (i.e. exploratory studies).[56] Hence, given that our study focuses on investigating the relationship between psychological distance and risky behavior in an exploratory manner, it is applicable to employ a cross-sectional design. As it should be, we also urge for

future studies to embrace longitudinal design to deeply explore the impact of psychological distance on public risky behavior and its complex process mechanisms under different evolutionary stages of the development of public health emergencies, so as to better reveal the development law of the relationship between the variables examined in our study. This paper only examines the effect of psychological distance on public risky behavior, in other words, integrating the four dimensions of psychological distance (that is temporally distance, spatially distance, socially distance and hypothetically distance) into a whole for research. Previous studies have indicated that different dimensions of psychological distance have different effects on behavior.[62] For example, closer temporal distance affect policy support and behavioral intentions for climate change mitigation, while spatial distance has no effect on either policy support or intention.[63] Therefore, we also call for future research to further explore the effect of different dimensions of psychological distance on public risky behavior, and verify the theoretical model of this study again, so as to obtain an abundant research conclusion. The data collection period in this paper coincided with the nationwide outbreak of public health emergencies in 2022 and a period of strict government prevention and control. Due to the limitations of experimenters' time, experience, and cost, only the snowball sampling method was used. Although it can save manpower and material resources, there may be situations where the participants are the same as each other and the data representativeness is not strong. Therefore, future research can adopt different data collection methods, such as stratified cluster sampling, to obtain more representative participants and further verify the research results obtained in this paper. This paper has not yet examined whether there are differences in risky behavior among different groups under public health emergencies. Previous studies have shown that teenagers during pandemic (similar to a closer temporal distance) exhibit more self-destructive behaviors than pre-pandemic samples.[6] About 1–2 months after the outbreak of the pandemic, older people tend to engage in more preventive personal behaviors than younger people.[64] Therefore, future research should conduct differential analysis on risky behavior of different groups, further expanding the results of this study.

Conclusion

Based on construal level theory, cognitive appraisal theory of emotions and mood maintenance hypothesis, we propose and verify the complex process mechanism of psychological distance influencing public risky behavior. The results show that psychological distance does not directly affect public risky behavior, while indirectly affect public risky behavior via increasing public risk perception and psychological insecurity under public health emergencies. We suggest that during public health emergencies, public health managers should pay extra attention to the risk perception and psychological insecurity level of the public with closer psychological distance, take measures to reduce their risk perception, enhance their psychological security, and reduce their risky behavior, thereby ensuring the physical and mental health of the public and maintaining the stability of economic and social order.

Data Sharing Statement

The datasets generated during and/or analyzed during the current study are available from the corresponding author on reasonable request.

Ethic Statement

The study was reviewed and approved by the ethical committee of School of Economics and Management, China University of Geosciences (Beijing). The study process was in accordance with the guidelines outlined in the Declaration of Helsinki. Informed consent was obtained from all study participants.

Acknowledgments

The author thanks the study participants, and the Professor Haiyan Liu from China University of Geosciences (Beijing) for her constructive suggestions on this paper.

Funding

There is no sponsor(s) support in this paper.

Disclosure

The authors report no conflicts of interest in this work.

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