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ARTICLE

Why existential threats increase conspiracy beliefs: Evidence for the mediating roles of agency detection and pattern perception

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Abstract

This research investigates the cognitive mechanisms linking health-related existential threats to conspiracy beliefs within a Chinese context. Study 1 ($N = 199$) demonstrated that the relationship between perceived existential threats and outgroup conspiracy beliefs is mediated by hypersensitive agency detection through an experimental manipulation involving a monkeypox virus threat. Studies 2a ($N = 198$) and 2b ($N = 200$) revealed that illusory pattern perception also mediates this relationship. In Study 3 ($N = 278$, using a manipulation of threatening information about genetically modified foods) and in Study 4 ($N = 296$, using information about Japan's discharge of nuclear sewage), both hypersensitive agency detection and illusory pattern perception mediated this relationship. Additional mini-meta-analyses further corroborated these findings. We conclude that the effects of existential threats on outgroup conspiracy beliefs are mediated by hypersensitive agency detection and illusory pattern perception.

KEYWORDS

crisis, existential threat, hypersensitive agency detection, illusory pattern perception, outgroup conspiracy theories

BACKGROUND

Worldwide crisis events such as the disappearance of Malaysia Airlines MH370, the US–China trade war, the COVID-19 pandemic, and the war between Russia and Ukraine have captured people's attention and either directly or indirectly affected their lives. These global crisis events also provide a

breeding ground for conspiracy theories (Hornsey et al., 2023; Mao et al., 2021; Mao, Zeng, et al., 2024; van Prooijen & Douglas, 2017; Zhao et al., 2024). For example, the 2008 financial crisis was once suspected of being engineered by Democratic bankers to get Barack Obama elected (van Prooijen & Douglas, 2017). During the COVID-19 pandemic, social media was awash with conspiracy theories about the origin, spread and treatment of the virus (Douglas & Sutton, 2023). These conspiracy theories explain major events as being caused by groups allegedly colluding to fulfil their malevolent goals (van Prooijen & Acker, 2015).

Surprisingly, little is known about why that is the case. The Existential Threat Model assumes that feelings of existential threat elicit cognitive sense-making processes, which in turn prompt people to believe in conspiracy theories (van Prooijen, 2020). No study has yet examined the underlying cognitive processes that mediate the link between societal crisis events and conspiracy beliefs. The current research aims to fill this void. Specifically, we argue that the mind's tendencies to detect agency and perceive patterns mediate the link between existential threats and conspiracy beliefs. While these variables have been linked to conspiracy beliefs in prior research (Douglas et al., 2016; Gligorić et al., 2021; Hartmann & Müller, 2023; Müller & Hartmann, 2023; van Prooijen et al., 2018), and recent meta-analyses have supported these links (Biddlestone et al., 2025; Bowes et al., 2023), this study is the first to test whether they mediate the effects of existential threats on conspiracy beliefs.

Existential threats, sense-making and conspiracy theories

Existential threat encompasses a broad spectrum of everyday anxieties and insecurities that people feel when they, or the people around them, experience harm or anticipate suffering losses (van Prooijen, 2020, 2022). Impactful and salient societal crisis situations are therefore likely to increase feelings of existential threat among the public. It has been argued that existential threat drives epistemic efforts to reduce cognitive uncertainty and to understand the external world (Douglas et al., 2017; Park, 2010; Van den Bos, 2009). In simpler terms, people try to find explanations for crisis events, which form the basis of a psychological sense-making process. Sense-making processes are defined as cognitive attempts to establish straightforward, meaningful and causal relationships between stimuli (van Prooijen, 2020).

Recent meta-analyses have found a significant positive correlation between the perception of existential threats (especially external threats, that is, threats coming from the social or physical environment) and views of the world as dangerous and conspiracy beliefs (Biddlestone et al., 2025; Bowes et al., 2023). Previous studies have provided more detailed evidence. For example, Mao et al. (2021) found that Chinese participants perceiving stronger systemic threats in the context of the COVID-19 pandemic were more likely to embrace conspiracy theories about an outgroup (the United States). Likewise, Jolley et al. (2018) found that after perceiving systemic threats, conspiracy theories led people to shift the attribution of social problems from the flaws of the system itself to hostile groups. In addition, when people feel that the political group they belong to is threatened by a lost election (Uscinski & Parent, 2014), perceive a threat to their religious identity (Mashuri & Zaduqisti, 2014), perceive intergroup threats from other countries (Mashuri & Zaduqisti, 2015), perceive higher ostracism threats (Poon et al., 2020), feel their personal image is threatened (Cichocka et al., 2016), experience increased racial discrimination (Crocker et al., 1999), perceive increased government corruption (Alper & Imhoff, 2023; Hornsey & Pearson, 2022) or perceive greater economic inequality (Casara et al., 2022; Zeng et al., 2024), they tend to believe in conspiracy theories more strongly. Altogether, these findings support the basic premise that feelings of existential threat increase conspiracy beliefs.

According to the Existential Threat Model of conspiracy theories (van Prooijen, 2020), sense-making processes stimulate conspiracy theories that provide causal explanations for such threatening events. Especially when an antagonistic outgroup is salient during a threatening event, these sense-making processes may turn into conspiracy theories blaming the event on a hostile plot by the outgroup. This process aligns with the evolutionary perspective that mental operations help people recognize the possible

dangers posed by potentially hostile groups in threatening situations and have been adaptive for ancestral humans (van Prooijen & van Vugt, 2018). We propose that such epistemic sense-making consists of at least two specific cognitive processes: illusory pattern perception and hypersensitive agency detection. Both cognitive processes are indeed associated with conspiracy beliefs (Bowes et al., 2023), although research has not yet established whether these processes mediate the effects of existential threats on conspiracy beliefs.

Several subtypes of existential threats exist; however, this has implications for the current purposes. Experimental manipulations of personal control—a construct closely associated with existential threats—have shown mixed effects on illusory pattern perception and conspiracy beliefs, with some studies finding a significant association (e.g. Van Harreveld et al., 2014; Whitson & Galinsky, 2008) and others finding no effect (e.g. Van Elk & Lodder, 2018; Varet et al., 2024). This also aligns with meta-analytic evidence that the association of conspiracy beliefs with low external control is stronger than with low personal control (Biddlestone et al., 2025; see also Stojanov & Halberstadt, 2020). Drawing on research on the Behavioural Immune System—and recognizing that pathogen and parasitic infections have arguably posed the greatest evolutionary threat to humans (Ackerman et al., 2018; Adam-Troian & Bagci, 2021)—existential threats often pertain to people's health. Our operationalizations of existential threats therefore were mostly in the health domain but also may pertain to other issues such as outgroup hostilities.

Furthermore, the relationship between existential threats, hypersensitive agency detection or illusory pattern perception may be different for various types of conspiracy beliefs. Specific conspiracy beliefs—especially conspiracy stereotypes—are more strongly correlated with these variables than general conspiracy mentality (Biddlestone et al., 2025; Bowes et al., 2023; Stojanov & Halberstadt, 2020). The Existential Threat Model suggests that when the sense-making processes identify an antagonistic outgroup, these risk factors are likely to manifest as outgroup conspiracy beliefs (van Prooijen, 2020). Outgroup conspiracy belief, as both a specific conspiracy belief (Mao, van Prooijen, et al., 2024) and a fit with conspiracy stereotypes (Biddlestone et al., 2025; Hornsey et al., 2023), therefore was used as the main dependent variable in the current research.

Hypersensitive agency detection

Hypersensitive agency detection refers to the tendency to assign purpose or agency to stimuli that do not necessarily have any agency (Barrett, 2004; Johnson & Barrett, 2003). Human beings have evolved in an environment full of agents that could influence their genetic fitness either for better (e.g. potential mates) or worse (e.g. potential enemies). It therefore has adaptive value to be sensitive to possible agency (Guthrie, 1993), putting selection pressure on the human brain to evolve mental models that detect agency in the environment (Barrett, 2004). Hypersensitive agency detection is a result of the processes stipulated in Error Management Theory (Johnson, 2009; Nola, 2014). Falsely assuming the presence of a threatening agent is usually less costly than failing to detect the agent's presence (Maij et al., 2019). Thus, threatening situations may induce individuals to react quickly (Douglas et al., 2016), leading to hypersensitive agency detection under uncertainty (Valdesolo & Graham, 2014).

Recent meta-analyses have demonstrated associations between conspiracy beliefs and reliance on automatic thinking, poor reasoning (linked to lower cognitive ability), and reduced reflective thinking or increased intuitive thinking. Hypersensitive agency detection, a feature of this cognitive style, shows comparable associations with conspiracy beliefs (Biddlestone et al., 2025; Bowes et al., 2023). Specifically, in situations with limited information, one may attribute intentionality and agency to understand what happened (Douglas et al., 2016; Hornsey et al., 2023). In the context of conspiracy theories, this basic process leads individuals to overestimate the power, malice, and foresight of the so-called conspirators, while underestimating the roles of accident, human error, and contingency (Shermer, 2011; van Prooijen & van Vugt, 2018). Douglas et al. (2016) found that people with lower education levels (and lower cognitive ability) may be more inclined to support

conspiratorial explanations of events because they are also more inclined to attribute intentionality and agency where it does not necessarily exist. In sum, we hypothesize that existential threats positively predict outgroup conspiracy beliefs, and that hypersensitive agency detection mediates this effect (Hypothesis 1).

Illusory pattern perception

Pattern perception refers to the mind's automatic tendency to identify meaningful and causal relationships between stimuli (Whitson & Galinsky, 2008; Zhao et al., 2014). Through pattern perception, people can understand external events and make predictions about the future. Like hypersensitive agency detection, illusory pattern perception has evolutionary significance. Detecting real, informative patterns is highly functional for human survival in a challenging ancestral environment (Walker et al., 2019). However, when individuals lack a sense of control or feel uncertain, this functional process can be distorted by increasingly associating stimuli that are, in fact, unrelated, resulting in illusory pattern perception—the identification of meaningful relationships between stimuli that are random or unrelated (van Prooijen et al., 2018; Whitson & Galinsky, 2008).

Previous studies have demonstrated a correlation between illusory pattern perception and various irrational beliefs, such as paranormal beliefs (Blackmore & Moore, 1994; van Prooijen et al., 2018), superstition (Whitson & Galinsky, 2008), pseudo-profound bullshit (Walker et al., 2019) and conspiracy beliefs (van Prooijen et al., 2018; Whitson & Galinsky, 2008). Similar to hypersensitive agency detection, illusory pattern perception is also a logical fallacy rooted in an intuitive thinking style (Hornsey et al., 2023). Therefore, recent meta-analyses have likewise found it correlated with conspiracy beliefs (Bowes et al., 2023). Integrating these previous findings, we hypothesize that existential threats positively predict outgroup conspiracy beliefs, and that illusory pattern perception mediates this effect (Hypothesis 2).

Current research overview

In this research, we report an exploratory, not preregistered correlational study (Study S1, in the Supplemental Materials) and five preregistered experimental studies (Studies 1, 2a, 2b, 3 and 4) that test the sense-making processes derived from the Existential Threat Model of conspiracy theories. Studies S1 and 1 tested Hypothesis 1. Study S1 is a cross-sectional survey in the context of the COVID-19 pandemic, whereas Study 1 features an experimental manipulation of exposure to the threat of the monkeypox virus. Studies 2a and 2b tested Hypothesis 2, again experimentally exposing participants to the threat of the monkeypox virus. Studies 3 and 4 tested both hypotheses using experimental manipulations of exposure to the threat of genetically modified foods and exposure to the threat of the discharge of nuclear sewage. All studies were conducted with Chinese samples. Additionally, we included mini meta-analyses of the above studies.

Open practices statement

All data and materials from the studies reported here are publicly available on the Open Science Framework (https://osf.io/dpnmz/files/osfstorage). For all the studies, we report all the conditions and measures (either in the Method sections or the Supplemental Materials); data exclusions (if any) are reported in the method sections of the respective studies. All the studies reported here have formal ethical approval, and all the studies (except for Study S1) were preregistered.[1]

[1]For Studies 1, 2a, 2b, 3: https://osf.io/emjbz; For Study 4: https://osf.io/msc6v.

STUDY 1

Before launching Study 1, we conducted a preliminary survey (Study S1, in the Supplemental Materials) in early December 2022, as the Chinese mainland prepared to ease nearly 3 years of strict COVID-19 policies. The goal was to explore the relationship between COVID-19-related existential threats and outgroup conspiracy beliefs and to test the mediating role of hypersensitive agency detection. While Study S1 confirmed correlations among these variables, it did not support Hypothesis 1. A plausible explanation for this is that Study S1 was conducted nearly 3 years after the outbreak of COVID-19, and the coronavirus had become much less lethal, reducing its perceived existential threat. Informed by these findings, we further tested Hypothesis 1 in Study 1 by exposing (versus not exposing) participants to an existential threat posed by the monkeypox virus. After the reading task, participants' hypersensitive agency detection and outgroup conspiracy beliefs were measured.

Method

Participants and design

As Study S1 is based on correlations, the effect sizes may not translate to the effects of experimental manipulations. Therefore, Study 1 has set the parameters for calculating the sample size based on general criteria. The study had a two-cell design (existential threat: exposure vs. control). Using G*Power 3.1 (Faul et al., 2009), an effect size (d) of 0.5 with an alpha level of .05, in an independent samples t-test requires a sample size of approximately 128 participants for 0.80 power to detect the effect (two tails). In addition, to determine whether the sample size was sufficient to detect the hypothesized mediation effect, a priori power analysis was conducted to estimate the minimum sample size. Following Cohen's (1988) guidelines, a medium effect size ($f^2 = 0.15$) was assumed, with an alpha level of .05, statistical power of .80, the analysis indicated that a minimum sample size of 68. Based on these results, we recruited 214 adult participants from mainland China through Credamo, a Chinese crowdsourcing site similar to Amazon's Mechanical Turk, in December 2022. Fourteen participants were excluded and did not complete the subsequent measurement due to poor performance on the test question related to watching the video to measure hypersensitive agency detection (see more details in the Materials and Procedure section). In addition, one participant was excluded for failing our attention test (e.g. 'See this question, please directly select the number "6"'). The final sample for data analysis consisted of 199 participants (100 in the experimental group, 99 in the control group; 76 male, 123 female, $M_{age} = 28.81$, $SD = 6.91$).

Materials and procedure

Following the manipulation of systemic threat in previous studies by Ullrich and Cohrs (2007), participants in the experimental condition were asked to read and memorize a piece of text concerning how the novel coronavirus and monkeypox virus are spreading and could have serious consequences. To reinforce participants' perception of the possible existential threat posed by the monkeypox virus, we also presented them with a picture of a monkeypox patient to enhance the visual impact and psychological perception (for the full text, see Appendix 2 in the online Supplemental Materials). Participants in the control condition did not read any written material but instead directly responded to the dependent variables.

Following previous studies (Marjanovic et al., 2015; van Prooijen & Acker, 2015), after the reading task, we asked participants in the experimental condition to write down at least 10 words about their true feelings after reading the materials. Participants were also asked to recall and write down at least 20

words about personal experiences in which they were harmed or threatened (such as physical and mental health, income, work, relationships, etc.) and how they felt about them.[2]

All participants then completed measurements of the remaining variables. We asked participants to watch the classic animation used by Heider and Simmel (1944), in which three shapes (a large triangle, a small triangle and a small circle) moved around the screen and in and out of a rectangular box. After watching the 90-s animation, participants were first asked to answer an attention detection question: 'In this video, how many triangles are there at most in the same picture?' Participants who watched the video carefully were able to easily choose '2' from five options: '1', '2', '3', '4' and '5'. Fourteen participants were excluded and did not continue to complete the follow-up questionnaire due to errors in answering this question, suggesting that they were not paying attention while watching the video. Consistent with Douglas et al. (2016), participants who passed the attention test were asked to answer six items (selected from the original 10 items) about shapes or the 'behaviour' of the shapes as a measure of hypersensitive agency detection (e.g. 'I think the shapes were human-like'; 'I think the behavior of the shapes was the result of conscious decisions'; 1 = *strongly disagree*, 7 = *strongly agree*; $a = .79$).

Individual differences in the anthropomorphism scale (IDAQ; Waytz et al., 2010) were measured as an additional measure of hypersensitive agency detection, consisting of six items (e.g. 'To what extent does a television set experience emotions?' 0 = *not at all*, 10 = *very much*; $a = .74$; selected from the original 15 items). To reduce questionnaire length, we selected a subset of items from some original scales.

Outgroup (the United States) conspiracy beliefs were assessed using the measure developed by van Prooijen and Song (2021). The measurement consisted of seven items (e.g. 'The secret agency of America has been trying to influence political decision-making in China'; 1 = *strongly disagree*, 7 = *strongly agree*; $a = .82$).

We also collected basic demographic information about all participants and provided them with a small monetary reward. At the end of the study, all participants in the experimental condition were told the text they had read was fictitious for research purposes and not based on a real situation.[3]

Results

First, we conducted a series of independent samples *t*-tests on participants' hypersensitive agency detection, anthropomorphism, and outgroup conspiracy beliefs. Results of the descriptive statistics and correlational analyses are shown in Table 1. Participants showed higher hypersensitive agency detection and outgroup conspiracy beliefs in the existential threat condition than in the control condition. However, anthropomorphism scores did not differ significantly between conditions. This suggests that our experimental manipulation significantly influenced the dependent variables (except for anthropomorphism). Furthermore, existential threats were positively correlated with both hypersensitive agency detection and outgroup conspiracy beliefs. Hypersensitive agency detection was also positively correlated with outgroup conspiracy beliefs.

We then tested the mediating effect of hypersensitive agency detection between existential threats and outgroup conspiracy beliefs. The results of the regression analysis showed that the total effect of existential threats on outgroup conspiracy beliefs was significant (total effect = .25, $CI_{95\%}$[.11; .39]). As shown in Figure 1, existential threats positively predicted hypersensitive agency detection ($\beta = .18$, $p = .010$, $CI_{95\%}$[.04; .32]); in turn, hypersensitive agency detection positively predicted outgroup

[2]After the manipulation, participants did not answer manipulation check questions to avoid the possibility that these questions would prime participants in the control group with an existential threat. However, we have tested the effectiveness of the current manipulation in a pilot study, showing that it effectively increased perceived existential threat among participants in the experimental group. See Appendix 3 of the online Supplemental Materials for details on this pilot study.

[3]As in Study 1, participants in the experimental condition of Studies 2a, 2b, 3, and 4 were informed afterward that the text materials were fictitious for research purposes and not based on a real situation.

TABLE 1 Independent samples *t*-tests, descriptive analysis and correlations (Study 1).

	Experimental group ($N=100$)		Control group ($N=99$)									
	M	**SD**	***M***	**SD**	***t***	**Cohen's *d***	***M***	**SD**	**1**	**2**	**3**	**4**
1. Exposure to existential threat							0.50	0.50	1			
2. Hypersensitive agency detection	5.45	0.88	5.14	0.82	2.59*	0.37	5.30	0.86	0.18*	1		
3. Anthropomorphism	5.19	1.49	5.13	1.62	0.25	0.04	5.16	1.55	0.02	0.26***	1	
4. Outgroup conspiracy belief	5.64	0.77	5.23	0.82	3.63***	0.52	5.43	0.82	0.25***	0.35***	0.41***	1

Note: Anthropomorphism is scored on a 0–10 scale. Unless otherwise noted, all other measured variables are scored on a 1–7 scale.

*$p < 0.05$;

**$p < 0.01$;

***$p < 0.001$.

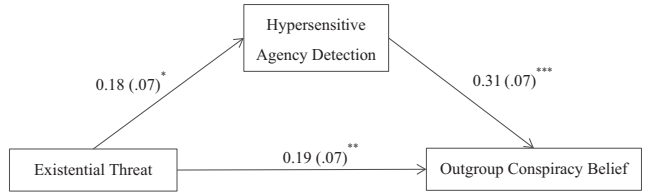

FIGURE 1 Mediation model (Study 1). All variables were standardized. Path values are the path coefficients with standard errors. *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$.

conspiracy beliefs ($\beta = .31$, $p < .001$, $CI_{95\%}$[.18; .45]). The residual direct effect was still significant ($\beta = .19$, $p = .004$, $CI_{95\%}$[.06; .32]). Hypersensitive agency detection therefore played a mediating role in the link between existential threats and outgroup conspiracy beliefs (indirect effect = .06, $CI_{95\%}$[.01; .12]), and the proportion of the mediating effect was 22.78%.

Discussion

Study 1 supports Hypothesis 1 by experimentally exposing (or not exposing) participants to current health-related existential threats. However, no effects were observed on the anthropomorphism measure in both studies. This may be due to the anthropomorphism scale being translated into Chinese for the first time or because anthropomorphism is a relatively indirect assessment of hypersensitive agency detection.

STUDY 2

Studies 2a and 2b used the same experimental design and manipulation materials as Study 1 to test Hypothesis 2. After the reading task, Studies 2a and 2b employed different measures of the mediating variable, illusory pattern perception (two measures in Study 2a and one measure in Study 2b). We expect to replicate the positive correlation found in Study 1 between existential threats and outgroup conspiracy beliefs to further demonstrate that illusory pattern perception also plays a mediating role between them.

STUDY 2A

Method

Participants and design

The study also had a two-cell design (existential threat: exposure vs. control). Based on the same power analysis as in Study 1, a total of 200 adult participants in mainland China were recruited through Credamo in January 2023. Two participants were excluded because they failed our attention checks (e.g. 'See this question, please directly select the number "3"'). The final sample for data analysis consisted of 198 participants (99 in the control group, 99 in the experimental group; 78 male, 120 female, $M_{age} = 30.29$, $SD = 7.31$).

Materials and procedure

Participants in the existential threat condition were asked to read and memorize the same materials used in Study 1. Participants in the control condition did not read any materials but instead responded to the dependent variables directly.

Following van Prooijen et al. (2018), we adopted two measures of illusory pattern perception. First, participants were presented with five paintings by the same modern artist, who is known for his random brush strokes and irregular figures. These five were selected from nine original paintings to shorten the measure. Each painting was followed by three questions, the first two of which were used as a distraction to make it plausible to participants that this part of the study was about art. The third question, then, was 'To what extent do you see a pattern in this painting?' (If you only see random strokes of paint, answer '1'; if you clearly see a pattern, answer '7'). Responses on this latter item for all five paintings were averaged ($a = .75$).

The second measure was to evaluate the randomness or certainty of the outcome of random coin tosses, originally from van Prooijen et al. (2018). It consisted of a sequence of 100 random coin tosses, subdivided into 10 sets, each containing the outcome sequence of 10 random coin tosses. Participants were asked to rate how random or determined the outcome sequence was for each set (1 = *completely random*, 7 = *completely determined*). After the 10 sequences, participants were also asked to answer the following question on the same rating scale: 'If the above result sequence is the result sequence of 100 consecutive tosses of the same coin, please re-evaluate how random or determined the outcomes are'. The scores of the above 11 items ($a = .85$) together constituted the second measure of illusory pattern perception. For outgroup conspiracy beliefs, we again adopted the same 7-item outgroup conspiracy belief scale ($a = .88$) as in Study 1.

Finally, we collected basic demographic information from all participants and provided them with a small monetary reward.

Results

First, we conducted a series of independent samples *t*-tests on both measures of illusory pattern perception (the modern art paintings and the coin tosses) and outgroup conspiracy beliefs. The results of descriptive statistics and correlational analyses are presented in Table 2. Participants displayed higher illusory pattern perception (both the modern art paintings and the coin tosses) and outgroup conspiracy beliefs in the existential threat condition than in the control condition. This suggests that our experimental manipulation significantly influenced our measured variables as expected. Moreover, existential threats were positively correlated with both illusory pattern perception (the coin tosses) and outgroup conspiracy beliefs. Illusory pattern perception (the coin tosses) was also positively correlated with outgroup conspiracy beliefs. However, illusory pattern perception (the modern art paintings) was not correlated with outgroup conspiracy beliefs. We thus included only the coin toss measure in the mediation analysis.

The results of the regression analysis showed that the total effect of existential threats on outgroup conspiracy beliefs was significant (total effect = .36, $CI_{95\%}$[.23; .49]). As shown in Figure 2, existential threats positively predicted illusory pattern perception ($\beta = .24$, $p < .001$, $CI_{95\%}$[.10; .37]); in turn, illusory pattern perception positively predicted outgroup conspiracy beliefs ($\beta = .17$, $p = .012$, $CI_{95\%}$[.04; .30]). The residual direct effect was still significant ($\beta = .32$, $p < .001$, $CI_{95\%}$[.19; .45]). Illusory pattern perception, therefore, partially mediated the link between existential threats and outgroup conspiracy beliefs (indirect effect = .04, $CI_{95\%}$[.01; .08]), and the proportion of the mediating effect was 11.24%.

STUDY 2B

Method

Participants and design

The study had the same experimental design as Study 2a (existential threat: exposure vs. control). Based on the same power analysis as in Study 2a, we recruited 200 adult participants in mainland

TABLE 2 Independent samples *t*-tests, descriptive analysis and correlations (Study 2a).

	Experimental group ($N = 99$)		Control group ($N = 99$)									
	M	**SD**	***M***	**SD**	***t***	**Cohen's *d***	***M***	**SD**	**1**	**2**	**3**	**4**
1. Exposure to existential threat							0.50	0.50	1			
2. Illusory pattern perception 1	3.07	1.06	2.60	0.87	3.42**	0.49	2.84	1.00	0.24**	1		
3. Illusory pattern perception 2	3.50	1.08	3.04	0.78	3.40**	0.49	3.27	0.97	0.24**	0.44***	1	
4. Outgroup conspiracy belief	5.67	0.64	4.96	1.14	5.41***	0.77	5.31	0.99	0.36***	0.13	0.25***	1

Note: Illusory pattern perception 1: modern art paintings; Illusory pattern perception 2: coin toss. All measured variables are scored on a 1–7 scale.

*$p < 0.05$;

**$p < 0.01$;

***$p < 0.001$.

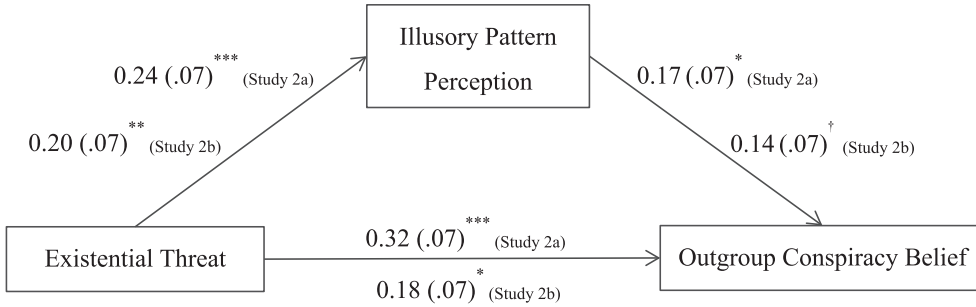

FIGURE 2 Mediation model (Studies 2a and 2b). All variables were standardized. Path values are the path coefficients with standard errors. $^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$.

China through Credamo in January 2023. All participants passed the attention check (e.g. 'See this question, please directly select the number "3"'). The final sample for data analyses consisted of 200 participants (100 in the control group and 100 in the experimental group; 82 male, 118 female, $M_{age} = 29.84$, $SD = 6.72$).

Materials and procedure

The procedure for the manipulation was the same as in Studies 1 and 2a. After the manipulation, all the participants completed a different measure of illusory pattern perception, namely the snowy pictures task by Walker et al. (2019) adapted from Whitson and Galinsky (2008). Participants were presented with 24 pictures. Twelve of the images contained a hard-to-perceive embedded object, whereas the other 12 contained only visual noise, with no object present. For each picture, participants were asked to respond with a 'yes' or 'no' indicating whether they saw an object in the picture presented. If the original picture did not contain an object, but the participant answered 'yes', such errors were counted as the score for the participant's illusory pattern perception. The 7-item outgroup conspiracy belief scale ($\alpha = .88$) was measured as in Study 2a.

All participants provided basic demographic information and received a small amount of money as a reward.

Results

First, we conducted a series of independent samples *t*-tests on participants' illusory pattern perception (snowy pictures task) and outgroup conspiracy beliefs. Results of descriptive statistics and correlations are shown in Table 3. Participants displayed higher illusory pattern perception and outgroup conspiracy beliefs in the existential threat condition than in the control. Moreover, there was no significant difference between conditions for the snowy pictures that did contain an object. Altogether, these findings indicate that our experimental manipulation influenced our measured variables as expected. Existential threats were positively correlated with both illusory pattern perception and outgroup conspiracy beliefs. Illusory pattern perception was also positively correlated with outgroup conspiracy beliefs.

We further tested the mediation effect of illusory pattern perception between existential threats and outgroup conspiracy beliefs. The results of the regression analysis showed that the total effect of existential threats on outgroup conspiracy beliefs was significant (total effect = .21, $CI_{95\%}$ [.07; .34]). As shown in Figure 2, existential threats positively predicted illusory pattern perception ($\beta = .20$, $p = .004$, $CI_{95\%}$ [.07; .34]); in turn, illusory pattern perception marginally positively predicted outgroup conspiracy beliefs ($\beta = .14$, $p = .051$, $CI_{95\%}$[−.001; .28]). The residual direct effect was still significant ($\beta = .18$,

TABLE 3 Independent samples *t*-tests, descriptive analysis and correlations (Study 2b).

	Experimental group (N=100)		Control group (N=100)									
	M	**SD**	***M***	**SD**	***t***	**Cohen's *d***	***M***	**SD**	**1**	**2**	**3**	**4**
1. Exposure to existential threat							0.50	0.50	1			
2. SPT (Object Absent)	5.16	2.59	4.02	2.92	2.92**	0.41	4.59	2.81	0.20**	1		
3. SPT (Object Present)	10.91	1.33	10.48	1.79	1.93	0.27	10.70	1.59	0.14	0.42***	1	
4. Outgroup conspiracy belief	5.49	0.77	5.11	1.02	2.98**	0.42	5.30	0.92	0.21**	0.17*	0.08	1

Note: SPT (object absent) = Responses endorsing the presence of an object in Modified Snowy Picture Task items which did not contain an object; SPT (object present) = Responses endorsing the presence of an object in Modified Snowy Picture Task items which contained an object. SPT (object absent) and SPT (object present) are scored on a 0–12 scale. Outgroup conspiracy belief is scored on a 1–7 scale.

*$p < 0.05$;

**$p < 0.01$;

***$p < 0.001$.

$p = .012$, $CI_{95\%}[.04; .32]$). Illusory pattern perception therefore partially mediated the link between existential threats and outgroup conspiracy beliefs (indirect effect = .03, $CI_{95\%}[.001; .06]$), and the proportion of the mediating effect was 13.58%.

Discussion

Study 2 supported Hypothesis 2 by using different measurement methods of illusory pattern perception. Only the measure of modern art paintings in Study 2a failed to support the mediation model. This might be because we selected only five paintings (out of nine) from the original measurement, which weakened the validity of this measurement method to some extent. The coin toss measure (2a) and the snowy pictures task (2b) did mediate the link between existential threats and conspiracy beliefs. Together with the mediating role of hypersensitive agency detection found in Study 1, these findings provide support for the underlying sense-making processes predicted by the Existential Threat Model.

STUDY 3

While Studies 1 and 2 examined the mediating roles of hypersensitive agency detection and illusory pattern perception in the effects of existential threats on outgroup conspiracy beliefs separately, Study 3 sought to examine both mediating variables simultaneously in a single study. Study 3 utilized a similar experimental design to Study 2, except that the manipulation focused on an existential threat posed by genetically modified food.

Method

Participants and design

The study used the same experimental design as Study 2. We recruited a total of 305 adult participants in mainland China through Credamo in March 2023. Twenty-two participants were excluded and did not complete the subsequent measurement for the same reason (poor performance on the test question related to watching the video) as in Study 1. In addition, five participants were excluded because they failed our attention test (e.g. 'See this question, please directly select the number "6"'). The final sample for data analysis consisted of 278 participants (138 in the experimental group, 140 in the control group; 109 male, 169 female), ranging in age from 18 to 58 years, with a mean age of 29.67 years ($SD = 7.50$).

Materials and procedure

Participants in the existential threat condition were asked to read and memorize an article from a blog, accompanied by a picture. The content of this article discusses the popularity of genetically modified food in China and its possible harm, as the safety of genetically modified food has always been a hot and controversial health-related topic in China (for the full text, see Appendix 4 in the online Supplemental Materials). As in Study 1, participants in the control condition did not read any materials but responded to the dependent variables directly.

Participants were asked to write down at least 20 words describing their true feelings after the reading task. We validated the manipulation in a pilot study prior to Study 3, which showed that the manipulation increased perceived existential threats among participants in the experimental condition (see Appendix 5 of the online Supplemental Materials for details on this pilot study).

The same 6-item ($a = .74$) scale of the shapes-moving video as in Study 1 was used to measure hypersensitive agency detection. The same 11-item ($a = .82$) scale of random coin tosses as in Study 2a was used to measure illusory pattern perception. The 7-item outgroup conspiracy belief scale ($a = .86$) was measured again as in Studies 1 and 2.

Finally, participants' basic demographic information was collected, and all participants received a small monetary reward.

Results

As reported in Table 4, participants displayed higher hypersensitive agency detection, illusory pattern perception and outgroup conspiracy beliefs in the existential threat condition than in the control. This indicates that our manipulation influenced our measured variables as predicted. All the variables were significantly positively correlated.

We tested the parallel mediating effect of hypersensitive agency detection and illusory pattern perception between existential threats and outgroup conspiracy beliefs. The regression analysis results (see Figure 3) showed that the total effect of existential threats on outgroup conspiracy beliefs was significant (total effect = .44, $CI_{95\%}$ [.33; .55]), and the residual direct effect was still significant ($\beta = .32$, $p < .001$, $CI_{95\%}$[.21; .44]). As shown in Figure 3, existential threats positively predicted hypersensitive agency detection ($\beta = .41$, $p < .001$, $CI_{95\%}$ [.30; .51]); in turn, hypersensitive agency detection positively predicted outgroup conspiracy beliefs ($\beta = .24$, $p < .001$, $CI_{95\%}$[.13; .35]). Thus, hypersensitive agency detection mediated the link between existential threats and outgroup conspiracy beliefs (indirect effect = .10, $CI_{95\%}$ [.03; .17]), and the proportion of the mediating effect was 22.23%. In addition, existential threats also positively predicted illusory pattern perception ($\beta = .15$, $p = .011$, $CI_{95\%}$[.04; .27]); in turn, illusory pattern perception positively predicted outgroup conspiracy beliefs ($\beta = .11$, $p = .037$, $CI_{95\%}$ [.01; .22]). However, the mediating effect of illusory pattern perception on the link between existential threats and outgroup conspiracy beliefs was not significant (indirect effect = .02, $CI_{95\%}$ [−.000; .05]), even though the 95% confidence interval was very close to not containing 0.

Furthermore, a Monte Carlo power analysis for indirect effects (Schoemann et al., 2017) revealed that the current sample size yielded 84% power to detect the parallel mediation effect in our data, which showed that the sample size in this study was sufficient for the parallel mediating effect analyses.

Discussion

Study 3 provided support for Hypothesis 1, but not for Hypothesis 2. We noted that the 95% confidence interval for the mediating effect of illusory pattern perception was very close to not containing 0; therefore, we planned to verify the parallel mediating effect of hypersensitive agency detection and illusory pattern perception again in a follow-up study.

STUDY 4

Study 4 used a similar experimental design to Study 3, except that the manipulation was altered to focus on an existential threat posed by the discharge of nuclear sewage from Japan. Using recent real-life threatening events as manipulation materials and re-examining the mediating role of hypersensitive agency detection and illusory pattern perception may improve the ecological validity of this research.

TABLE 4 Independent samples *t*-tests, descriptive analysis and correlations (Study 3).

	Experimental group ($N = 138$)		Control group ($N = 140$)									
	M	**SD**	***M***	**SD**	***t***	**Cohen's *d***	***M***	**SD**	**1**	**2**	**3**	**4**
1. Exposure to existential threat							0.50	0.50	1			
2. Hypersensitive agency detection	5.68	0.60	5.03	0.84	7.37***	0.89	5.35	0.80	0.41***	1		
3. Illusory pattern perception	3.33	0.95	3.03	0.97	2.58*	0.31	3.18	0.97	0.15*	0.18**	1	
4. Outgroup conspiracy belief	5.82	0.57	4.97	1.10	8.12***	0.98	5.39	0.98	0.44***	0.39***	0.20**	1

Note: All measured variables are scored on a 1–7 scale.

*$p < 0.05$;

**$p < 0.01$;

***$p < 0.001$.

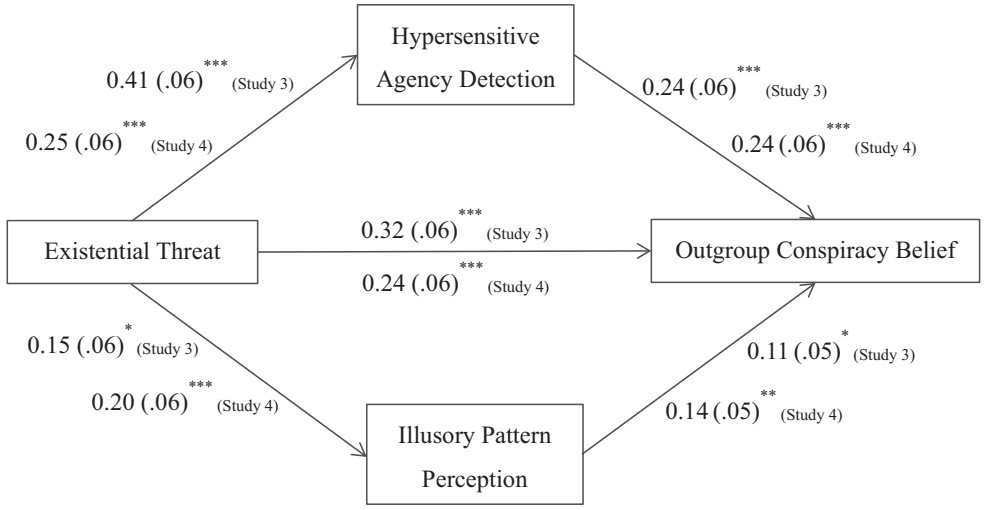

FIGURE 3 Mediation model (Studies 3 and 4). All variables were standardized. Path values are the path coefficients with standard errors. $*p < 0.05$, $**p < 0.01$, $***p < 0.001$.

Method

Participants and design

The study used the same experimental design as Study 3. Referring to the same Monte Carlo power analysis for indirect effects (Schoemann et al., 2017) conducted in Study 3, based on the correlation coefficients and standard deviations among the variables in Study 3, at least 270 participants were required to reach the 80% target power to detect the parallel mediation effect. We recruited a total of 312 adult participants in mainland China through Credamo in March 2024. Fourteen participants were excluded and did not complete the subsequent measurement for the same reason (poor performance on the test question related to watching the video) as in Study 1. In addition, two participants were excluded because they failed our attention test (e.g. 'See this question, please directly select the number "6"'; one from the experimental condition and one from the control condition). The final sample for data analysis consisted of 296 participants (149 in the experimental group, 147 in the control group; 116 male, 180 female), ranging in age from 18 to 63 years, with a mean age of 30.11 years ($SD = 7.96$).

Materials and procedure

Participants in the existential threat exposed condition were also asked to read and memorize an article from a blog, accompanied by pictures. The content of this article discusses the potential threat to the world, particularly to China, caused by Japan's discharge of nuclear sewage. This is a real and urgent social issue that has aroused widespread concern in China. Unlike previous studies, participants in the control condition read unrelated popular science material about geography that introduced species in the Himalayas (for the full text of the threat and control conditions, see Appendices 6 and 7 in the online Supplemental Materials).

All participants were asked to write down at least 20 words describing their true feelings after the reading task. Additionally, we validated the manipulation in a pilot study conducted prior to Study 4, which demonstrated that the manipulation significantly increased perceived existential threats among participants in the experimental condition compared to the control condition (see Appendix 8 of the online Supplemental Materials for details on this pilot study).

The same six-item ($a = .83$) scale for watching shapes-moving videos, used in Study 1, was employed to measure hypersensitive agency detection. The same 11-item ($a = .82$) scale for random coin tosses, as utilized in Study 2a, was employed to measure illusory pattern perception. The 7-item outgroup conspiracy belief scale ($a = .91$) was again measured as in previous studies.

Finally, the basic demographic information of the participants was collected, and all participants received a small monetary reward.

Results

As reported in Table 5, the results of independent samples *t*-tests indicated that participants had higher hypersensitive agency detection, illusory pattern perception and outgroup conspiracy beliefs in the existential threat condition than in the control. This further suggests that our manipulation significantly influenced the measured variables as predicted. All the variables were significantly positively correlated.

We tested the parallel mediating effects of hypersensitive agency detection and illusory pattern perception on the relationship between existential threats and outgroup conspiracy beliefs. The results of the regression analysis indicated that the total effect of existential threats on outgroup conspiracy beliefs was significant (total effect = .33, $CI_{95\%}$ [.22; .44]), and the residual direct effect remained significant ($\beta = .24$, $p < .001$, $CI_{95\%}$ [.13; .35]). As shown in Figure 3, existential threats positively predicted hypersensitive agency detection ($\beta = .25$, $p < .001$, $CI_{95\%}$ [.14; .36]); in turn, hypersensitive agency detection positively predicted outgroup conspiracy beliefs ($\beta = .24$, $p < .001$, $CI_{95\%}$ [.13; .35]). Therefore, hypersensitive agency detection again mediated the link between existential threats and outgroup conspiracy beliefs (indirect effect = .06, $CI_{95\%}$ [.02; .12]), with the proportion of the mediating effect at 18.78%. Additionally, existential threats also positively predicted illusory pattern perception ($\beta = .20$, $p < .001$, $CI_{95\%}$ [.09; .31]); in turn, illusory pattern perception positively predicted outgroup conspiracy beliefs ($\beta = .14$, $p = .009$, $CI_{95\%}$ [.04; .25]). Illusory pattern perception also mediated the relationship between existential threats and outgroup conspiracy beliefs (indirect effect = .03, $CI_{95\%}$ [.005; .06]), with the proportion of the mediating effect at 8.62%.

Discussion

Study 4 supported both hypotheses, although the effect was stronger for hypersensitive agency detection than for illusory pattern perception. Furthermore, since the direct effect of existential threats on outgroup conspiracy beliefs remained significant after controlling for the two mediators, there may be other mediating variables that were not identified in the current studies. Hypersensitive agency detection and illusory pattern perception reflect cognitive fallacies, but from an existential and social-motivational perspective, factors like sense of control (compensating for threat) and collective narcissism (protecting positive ingroup identity) may also mediate this relationship (Douglas & Sutton, 2023). Exploring these alternatives offers promising directions for future research.

Mini meta-analysis

We then conducted a mini meta-analysis on the current findings (the five studies reported in this paper and Supplemental Study S1) using two-stage structural equation modelling (TSSEM; Cheung, 2014). Two separate meta-analyses were performed for the two mediators. In the first stage of analysis, we estimated an average correlation matrix using a random effects model. The average correlations for the pairs existential threat-hypersensitive agency detection, existential threat-outgroup conspiracy belief and hypersensitive agency detection-outgroup conspiracy belief were 0.24 ($p < .001$, $CI_{95\%}$ [.15, .33]), 0.35 ($p < .001$, $CI_{95\%}$ [.29, .40]) and 0.30 ($p < .001$, $CI_{95\%}$ [.21, .39]), respectively. The population correlation

TABLE 5 Independent samples *t*-tests, descriptive analysis and correlations (Study 4).

	Experimental group ($N = 149$)		Control group ($N = 147$)									
	M	**SD**	***M***	**SD**	***t***	**Cohen's *d***	***M***	**SD**	**1**	**2**	**3**	**4**
1. Exposure to existential threat							0.50	0.50	1			
2. Hypersensitive agency detection	5.54	0.73	5.07	1.05	4.50***	0.52	5.31	0.93	0.25***	1		
3. Illusory pattern perception	3.44	0.87	3.09	0.88	3.46**	0.40	3.27	0.89	0.20**	0.20**	1	
4. Outgroup conspiracy belief	5.54	0.98	4.80	1.16	5.93***	0.69	5.17	1.13	0.33***	0.33***	0.24***	1

Note: All measured variables are scored on a 1–7 scale.

*$p < 0.05$;

**$p < 0.01$;

***$p < 0.001$.

matrices were heterogeneous, with $\chi^2(df = 9) = 27.77$, $p = .001$. The average correlations for the pairs existential threat-illusory pattern perception, existential threat-outgroup conspiracy belief, and illusory pattern perception-outgroup conspiracy belief were 0.19 ($p < .001$, $CI_{95\%}$ [.13, .25]), 0.34 ($p < .001$, $CI_{95\%}$ [.25, .42]) and 0.22 ($p < .001$, $CI_{95\%}$ [.16, .28]), respectively. The population correlation matrices were homogeneous, with $\chi^2(df = 9) = 10.47$, $p = .31$.

In the stage-two analysis, we fitted the mediation model to the average correlation matrix. Since the mediation model was just identified, there was no test statistic for its model fit. For hypersensitive agency detection, the estimated path coefficients (and their 95% likelihood-based confidence intervals [LBCIs]) on a, b and c' were 0.24 ($LBCI_{95\%}$[.15, .33]), 0.23 ($LBCI_{95\%}$[.13, .33]) and 0.29 ($LBCI_{95\%}$[.23, .35]), respectively. The estimated indirect and direct effects (and their 95% LBCIs) were 0.06 ($LBCI_{95\%}$[.03, .09]) and 0.29 ($LBCI_{95\%}$ [.23, .35]), respectively. All the estimated coefficients were statistically significant. For illusory pattern perception, the estimated path coefficients (and their 95% LBCIs) on a, b and c' were 0.19 ($LBCI_{95\%}$ [.13, .25]), 0.16 ($LBCI_{95\%}$ [.10, .22]) and 0.31 ($LBCI_{95\%}$ [.22, .39]), respectively. The estimated indirect and direct effects (and their 95% LBCIs) were 0.03 ($LBCI_{95\%}$ [.02, .05]) and 0.31 ($LBCI_{95\%}$ [.22, .39]), respectively. All the estimated coefficients were statistically significant. Therefore, the results of the mini meta-analysis supported the finding that the effects of existential threats on outgroup conspiracy beliefs are mediated by hypersensitive agency detection and illusory pattern perception.

GENERAL DISCUSSION

Throughout human history, social crises have increased conspiracy beliefs. A common theoretical explanation for this is that feelings of fear, uncertainty and loss of control trigger sense-making processes, increasing the likelihood of detecting conspiracy in social contexts (van Prooijen & Douglas, 2017). Previous evidence (e.g. Jolley et al., 2018; Mao et al., 2021) and recent meta-analyses (Biddlestone et al., 2025; Bowes et al., 2023) support the notion that feelings of existential threat increase outgroup conspiracy beliefs. However, no studies to date have examined the cognitive processes underlying this effect. Building on the Existential Threat Model of conspiracy theories (van Prooijen, 2022), perspectives from evolutionary psychology (van Prooijen & van Vugt, 2018) and previous empirical evidence (e.g. Douglas et al., 2016; Whitson & Galinsky, 2008), we propose that hypersensitive agency detection and illusory pattern perception mediate the relationship between existential threats and outgroup conspiracy beliefs.

We conducted six studies (five reported in this contribution and one in the supplement) to explore the specific cognitive processes that mediate the effects of existential threats on outgroup conspiracy beliefs. Study 1 (but not Study S1) provided evidence that hypersensitive agency detection mediated the link between existential threats and outgroup conspiracy beliefs. Studies 2a and 2b indicated that the existential threat caused by the monkeypox virus increased illusory pattern perception, which in turn predicted higher outgroup conspiracy beliefs. Studies 3 and 4 replicated previous findings through exposure to genetically modified foods and the discharge of nuclear sewage separately, and the results indicated that hypersensitive agency detection and illusory pattern perception both mediated these effects in parallel, although the mediating role of hypersensitive agency detection was more pronounced than that of illusory pattern perception. Additional mini meta-analyses supported the mediating roles of both hypersensitive agency detection and illusory pattern perception.

The current research extends existing knowledge in at least two ways. First, while the link between existential threats and conspiracy beliefs is well established, no evidence has yet been provided for the underlying cognitive processes that mediate this link. In the context of different health-related existential threats (the COVID-19 pandemic, the monkeypox virus, genetically modified foods and the discharge of nuclear sewage), the current studies reveal the mediating role of hypersensitive agency detection and illusory pattern perception. These findings provide the first empirical support for the theoretical assumption that basic sense-making processes explain the effects of existential threats on conspiracy beliefs.

Second, the results of Study S1 suggested that these sense-making processes were only related to conspiracy theories about the outgroup but not the ingroup. The subsequent five studies once again supported the notion that outgroup conspiracy beliefs would ultimately be formed through the sense-making processes described here. This finding is consistent with the assumption that sense-making processes only stimulate conspiracy theories about an antagonistic outgroup (van Prooijen, 2020). Moreover, these sense-making processes may inspire the social motive to maintain a positive image of the ingroup (Douglas et al., 2017). Furthermore, this finding supports basic assumptions from Social Identity Theory. When people feel threatened, they may display ingroup preference, outgroup discrimination and perceive intergroup conflict (Riek et al., 2006; Tajfel & Turner, 1982). In particular, the experimental materials in Study 4 contained existential threats from Japan but still predicted conspiracy theories about the United States (another outgroup) through sense-making processes. The current findings complement these insights by revealing that perceived threat primarily increases conspiracy theories about hostile outgroups (Cichocka et al., 2016; van Prooijen & van Dijk, 2014), while its effect on ingroup conspiracy theories requires further investigation.

Additionally, the current findings may hold practical implications by contributing to a framework for developing interventions to reduce conspiracy beliefs during public crises, particularly in public health. Since both hypersensitive agency detection and illusory pattern perception reflect cognitive fallacies, enhancing cognitive skills (e.g., analytic thinking, Swami et al., 2014) and promoting epistemic rationality (Ståhl & van Prooijen, 2018) during crises may help mitigate such beliefs. However, more targeted strategies remain to be developed.

Strengths, limitations and future directions

The current studies had several notable strengths. We found relatively consistent results across the six studies, with the same measures showing similar effects across different studies. Moreover, our studies were well powered, suggesting that our findings are robust and likely to replicate in follow-up studies.

It should be noted that the current research still has some limitations, which need to be further examined or improved in future studies. First, the field of conspiracy theory psychology generally suffers from an over-reliance on samples from Western, educated, industrialized, rich, and democratic (WEIRD) countries. The current study relied on participants from mainland China, which enriches the diversity of samples used in conspiracy theory research but also limits the generalizability of our findings to other (e.g., Western) populations.

Second, it is worth noting that while the predictions were supported for all other measures, for the anthropomorphism scale (Studies S1 and 1) and the modern art paintings measure (illusory pattern perception; Study 2a) the predictions were not supported. It remains speculative why this is the case. Both measures were translated into Chinese for the first time, and the cross-cultural applicability of these measures is unclear. Moreover, to reduce questionnaire length, for both measures, we selected some items from the original measures, which may also have decreased the validity of these measures. Additionally, Biddlestone et al. (2025) noted that evidence for the impact of cognitive uncertainty on conspiracy beliefs is mixed — significant in non-student samples but not in student samples. Since all our studies relied on the Credamo platform, we faced a known limitation: without strictly filtering for non-student participants, some college students may have been included in the adult sample. Meanwhile, we did not gather information on participants' occupations, socioeconomic status, or student status, limiting our ability to distinguish between student and non-student samples for further analysis. Like other crowdsourcing platforms (e.g., MTurk), Credamo may also raise concerns about generalizability, participant engagement, and response quality (e.g., Douglas et al., 2023). It is important to keep in mind, however, that our hypotheses were consistently supported by the same validated measures of agency detection and pattern perception; only these measures were used in Studies 3 and 4.

Third, the methodology of this research has some limitations. In Studies 1, 2a, 2b, and 3, participants in the experimental conditions read threatening materials to heighten perceptions of health-related

existential threats, while control participants received no information. Although Study 4 partly addressed this limitation, a key concern is that topics like monkeypox and genetically modified foods may inherently evoke conspiracy associations, particularly since the monkeypox reading material mentioned the virus was artificially engineered. Using such stimuli to induce existential threats could unintentionally increase conspiratorial thinking, leading to circular reasoning — especially since conspiracy beliefs are self-reinforcing (e.g., Granados Samayoa et al., 2022; Nera, 2024) but the control condition lacks equivalent content to balance this bias.

This also raises another key issue: the relationship between existential threats and conspiracy beliefs may be bidirectional, and some studies have suggested that while existential threats can increase conspiracy beliefs, the reverse may also occur (e.g., Adamus et al., 2025; Albath et al., 2024; Liekefett et al., 2023). This aligns with the Existential Threat Model, which posits that conspiracy beliefs can feed back into existential threat perceptions (van Prooijen, 2020). Consequently, our experimental design cannot rule out the possibility that the results partly stem from prior exposure to conspiracy beliefs, nor can it clarify the direction of causality between the two. Overall, these issues call for more rigorous experimental and longitudinal designs in future research (Biddlestone et al., 2025).

Furthermore, our methodology may have been affected by a stimulus sampling issue (Wells & Windschitl, 1999; see also Fiagbenu et al., 2021). Although the experimental materials mostly emphasized individual health-related existential threats, Chinese participants may have partially interpreted them as threats from outgroups (primarily the United States), which directly overlap with the conspiracy targets measured in the dependent variable. Study 4 partly addresses this issue, as the threat from nuclear sewage discharge is clearly attributed to Japan, despite its geopolitical alignment with the United States and other Western countries. Therefore, future research should further explore subtypes of existential threats and conspiracy theories.

CONCLUDING REMARKS

Social crisis situations provide a breeding ground for conspiracy theories. The Existential Threat Model of conspiracy theories (van Prooijen, 2020) aims to explain why conspiracy theories become so prominent in social crisis situations. The current research has tested the core cognitive sense-making processes in the model by investigating the mediating role of hypersensitive agency detection and illusory pattern perception. The results support the idea that after perceiving health-related existential threats, individuals generate outgroup conspiracy beliefs through increased hypersensitive agency detection and illusory pattern perception. These findings provide empirical support for the theoretically posited processes linking existential threats and conspiracy beliefs and, therefore, extend existing knowledge of the psychological mechanisms through which people generate conspiracy beliefs in social crisis situations.

AUTHOR CONTRIBUTIONS

Jia-Yan Mao: Conceptualization; methodology; software; data curation; investigation; validation; formal analysis; supervision; funding acquisition; visualization; project administration; resources; writing – original draft; writing – review and editing. **Zhao-Xie Zeng:** Data curation; methodology; conceptualization; investigation. **Shen-Long Yang:** Conceptualization; methodology; funding acquisition; writing – review and editing. **Yong-Yu Guo:** Funding acquisition; resources; supervision; project administration. **Bo Wang:** Methodology; software; formal analysis; writing – review and editing. **Jan-Willem van Prooijen:** Conceptualization; methodology; investigation; validation; supervision; resources; project administration; visualization; writing – original draft; writing – review and editing; formal analysis.

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CONFLICT OF INTEREST STATEMENT

No conflict of interest exists in the submission of this manuscript, and the manuscript has been approved by all authors before submission.

DATA AVAILABILITY STATEMENT

All data and materials of the studies reported here are publicly available on the Open Science Framework (https://osf.io/dpnmz/files/osfstorage). All the studies (except for Study 1a) were preregistered. Specifically, for Studies 1b, 2a, 2b and 3: https://osf.io/emjbz and for Study 4: https://osf.io/msc6v.

ETHICS STATEMENT

All the studies were approved by the appropriate ethics review board. All ethical guidelines for human subjects' research were followed.

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