COVID-19 Outbreak Enhances Making Meaning in Negative Experiences:

Evidence from China

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Abstract

The present research investigated whether the outbreak of COVID-19 would increase Chinese participants' tendency of seeing meaning in negative experiences (MINE). A longitudinal study (Study 1, $N = 2535$) showed that Chinese college students reported higher tendency of MINE during the outbreak of COVID-19 than three months before the outbreak. A cross-sectional study (Study 2) investigated a large student sample ($N = 16096$) and a large non-student sample ($N = 11446$) during the outbreak of COVID-19 in China and consistently showed that participants who were encountering high disease threat reported stronger perceived threat as well as greater tendency of MINE than those who were encountering low disease threat. Furthermore, the heightened perception of threat accounted for the heightened tendency of MINE. These results suggest that the COVID-19 outbreak makes Chinese more likely to see meaning in negative experiences, which may provide benefits for coping.

Key words: COVID-19, infectious disease, meaning in negative experiences (MINE), coping

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“Good fortune follows upon disaster; disaster lurks within good fortune.”---- *《Tao Te Ching》*

The outbreak of the novel coronavirus (COVID-19) has posed such a huge threat to people all over the world that the WHO declared it as a pandemic on March 11, 2020. The present research examined how individuals coped with the situation when threatened by the pandemic, and in particular, how people understood the threats and drew meaning from such a negative situation (Park, 2010), by focusing on participants in China, where the pandemic struck first. In the following section, we will review existing research on the psychological impacts of infectious disease, and then focus on meaning making as a coping strategy, particularly among Chinese people, before presenting empirical studies.

The Impacts of Infectious Disease on Human Psychology and Behaviors

Human beings have a long history of dealing with diverse threats. Infectious diseases constitute one of the most serious threats to humans (Ewald, 1995; Inhorn & Brown, 1990; Wolfe, Dunavon, & Diamond, 2007). Research has shown that the threat of infectious disease can exert extensive influences on human psychology and behaviors, involving various cognitions, emotions, social interactions, and social influences. For instance, in response to the infectious disease threat, people may exhibit heightened tendency in many aspects: vigilance and disgust to infection cues (Miller & Maner, 2012; Oaten, Stevenson, & Case, 2009), behavioral avoidance of

contact with potential infection (Ryan, Oaten, Stevenson, & Case, 2012), prejudice against infected or high-risk people (O'Shea, Watson, Brown, & Fincher, 2020), perception of ingroup and outgroup dissimilarity (Reid et al., 2012), conservative attitude (Beall, Hofer, & Schaller, 2016), cautiousness of sexual behaviors (Murray, Jones, & Schaller, 2013), conformity (Wu & Chang, 2012), intolerance of moral violation (Horberg, Oveis, Keltner, & Cohen, 2009), and so on (for reviews, See Murray & Schaller, 2016; Schaller, Murray, & Bangerter, 2015). Relevant to our current study are the impacts of infectious disease on cultural behaviors and values. In this regard, research has established that the threat of infectious diseases fosters a culture of collectivism (Fincher, Thornhill, Murray, & Schaller, 2008), via enhancing self-family ties, ingroup favoritism, conformity to cultural norms, and adherence to cultural traditions (Fincher & Thornhill, 2012; Murray & Schaller, 2016; Schaller et al., 2015).

To understand these responses of infectious disease, a behavior immune system (BIS) theory has been proposed (Murray & Schaller, 2016; Schaller et al., 2015). According to this theory, the BIS is the product of evolution, which has developed through humans' long history of combating infectious diseases (Murray, 2014). The system's responses can help people detect the risk of infection beforehand (e.g., through heightened vigilance to infection cues) and keep away from the disease (e.g., through xenophobia), thus protecting people from being infected. Apparently, the BIS functions similarly to the physiological immune system in the body. Yet, BIS protects people before people get infected, whereas the physiological immune system protects

people after they are infected. Thus, they function complementarily in safeguarding people.

Although many studies have examined the influences of infectious diseases on human behaviors, none has examined its impact on a special kind of culture-related coping strategy, that is, meaning making in negative experience, let alone in a real-life outbreak of infectious disease such as the COVID-19. The present research aims to fill this gap.

Meaning Making as a Coping Strategy

Meaning making refers to the way in which individuals construe, understand, and make sense of life events (Gillies, Neimeyer, & Milman, 2014). According to Park (2010), most meaning making theories assume that people hold orienting systems, also called global meaning, which provide people with a motivation and a framework to interpret their life experience. When the current situation challenges or threatens the global meaning, individuals tend to appraise the situation and assign meanings to it. The process of meaning making, fitting the situational meaning with the global meaning, when successful, leads to better adjustment to the situation.

Meaning making is particularly crucial in negative situations (Gillies & Neimeyer, 2006; Park & Folkman, 1997). Although some researchers (e.g., Bonanno, Papa, Lalande, Zhang, & Noll, 2005) have argued that meaning making efforts represent “unproductive rumination reflecting distress rather than adaptive recovery processes” (Park, 2010, p.262), other researchers have shown that meaning making is associated with positive adjustments and less distress (Gillies & Neimeyer, 2006; Park &

Folkman, 1997; Sears, Stanton, & Danoff-Burg, 2003), because meaning making can help people restore a sense of meaning and significance in their life (Heintzelman & King, 2014).

Relevant to our current research is a special kind of meaning making strategy, that is, the tendency of seeing Meaning in Negative Experiences (MINE). MINE has been operationalized as “general positive beliefs about negative experiences and tendency to actively reflect on the meaning or value of negative experiences” (p7, Khei, 2019). Recent research has linked MINE to some positive coping strategies: people with high MINE are more likely to adopt acceptance and positive reframing and momentarily heightened MINE would lead to heightened probability of adopting acceptance and positive reframing (Study 2 & 3, Khei, 2019). This research also showed that MINE is relevant to culture: people in a culture with high dialecticism manifest higher tendency of MINE; moreover, momentarily heightened dialecticism would lead to heightened tendency of MINE (Khei, 2019).

Given MINE’s implication for coping with negative events, it is important to investigate how people would employ MINE when confronted with a real-life pandemic threat such as COVID-19. A possibility is that the outbreak of COVID-19 would enhance people’s tendency of MINE, presumably helping people cope with the pandemic more effectively.

We tested this possibility in China, for two reasons. First, China was the first epicenter of the outbreak of COVID-19. Secondly, seeing meaning in negative experience is consistent with the cultural wisdom in China, which emphasizes na ĩe

dialecticism (Peng & Nisbett, 1999). Naive dialecticism refers to the belief that positive and negative elements not only coexist but also complement and reinforce each other (Peng & Nisbett, 1999; Ji, Su, & Nisbett, 2001). As a result, dialectical thinkers tend to derive positive implications from negative situations, a tendency that has been promoted by the Chinese cultural system. Indeed, cross-cultural research has indicated that Chinese people exhibit a higher level of dialectical thinking (Peng & Nisbett, 1999; Nisbett, 2003) and also a higher level of MINE compared to their Western counterparts (Khei, 2019).

Given that ecological threats such as disease threat could increase people's adherence to their cultural traditions (e.g., Gelfand et al., 2011; Murray & Schaller, 2016; Schaller et al., 2015), we expect that the outbreak of COVID-19 in China would make Chinese people particularly likely to engage in MINE, a traditional cultural wisdom for them to cope with threats.

Overview

To examine whether the outbreak of COVID-19 would enhance the tendency of MINE, we conducted two studies in China. Study 1 was a two-wave longitudinal study comparing people's MINE tendency before and during the outbreak of COVID-19. Study 2 was a cross-sectional study conducted during the outbreak of COVID-19. Both studies tested the prediction that the threat of the COVID-19 outbreak would increase Chinese participants' tendency of seeing meaning in negative experiences (MINE), which can potentially serve as a coping strategy.

Study 1

In a two-wave longitudinal study, we examined whether participants' tendency of MINE would increase when encountering the COVID-19 outbreak.

Method

Participants

The study was conducted at a university in China. The first wave of data were collected three months before the COVID-19 outbreak (October 2019) as part of a comprehensive psychological test among first-year university students. The second wave of data was collected during the COVID-19 outbreak (February 7 to February 17, 2020). A total of 2535 participants (1180 men and 1355 women) participated in both waves (Mean age = 20.07 years, $SD = 1.02$).

Measures

In the first wave, we collected participants' demographic information, including gender, age, and the socioeconomic status (SES) of their family and so on. In both waves, participants completed the Chinese version of the MINE scale along with other measures unrelated to the present research. The 9-item MINE scale measures participants' general lay beliefs in the meaning and value of negative experiences (e.g., "I think that experiencing negative events in life is meaningful"), as well as the tendency of actively reflecting on the meaning or value of the negative experiences (e.g., "I actively focus on the meaning of the negative events that I encounter"). Participants indicated their agreement with each of the statements along a 6-point scale (1 = *Strongly disagree*, 6 = *Strongly agree*). The Chinese version has been validated in previous research (Khei, 2019). In our current study, the Cronbach's

alpha coefficients of the MINE scale were 0.83 and 0.82 for the first and second waves, respectively.

Results and Discussion

We reverse coded the negatively framed items of MINE before computing a mean score across all items. The mean MINE scores from the two waves were significantly correlated, $r = 0.45$, $p < .001$. This moderate rank stability suggests moderate variability of MINE in response to situational variation. To examine the change of MINE score, we conducted a repeated ANCOVA with wave as a within-subject variable and with gender, age and SES as control variables. Results showed that the MINE score of the second wave ($M = 4.83$, $SD = 0.75$) was significantly higher than that of the first wave ($M = 4.67$, $SD = 0.76$), $F(1, 2531) = 8.15$, $p = .004$, 95% confidence interval (CI) [.13, .19], $d = 0.20$, suggesting that the outbreak of COVID augmented participants' tendency of seeing meaning in negative experiences.

Study 1, a longitudinal study, provided initial evidence that the outbreak of COVID-19 had enhanced Chinese participants' tendency of drawing meaning from negative experiences. The study, however, has limitations. First, the second wave data was collected during the Spring Festival, the most important traditional holiday for Chinese to celebrate the Lunar New Year. The Spring Festival may promote behaviors in line with Chinese cultural traditions such as dialectical thinking, thus contributing to an enhanced level of MINE. Second, Study 1 relied solely on university students and it was unclear whether the findings could be generalized to community samples. To address these concerns, we conducted Study 2.

Study 2

Study 2 was based on a large-scale survey conducted during the outbreak of COVID-19 in China (between January 31 and February 12, 2020). In this study, we further tested the hypothesis that the threat of COVID-19 might enhance MINE among Chinese people. In particular, we examined whether those who were more threatened by the pandemic would exhibit a higher level of MINE than those who encountered low threat. Furthermore, Study 2 investigated a large student sample and a large community sample simultaneously. By analyzing these two samples separately, we could examine the replicability and generalizability of the findings in Study 1 with a cross-sectional design.

Method

Participants

A total of 35519 participants from 34 provinces or regions across China were investigated. Participants who did not meet the following criteria were removed: 1) providing a reasonable birth year (i.e., between 1940-2006); 2) completing the whole survey in a reasonable time (i.e., between 300s to 36000s); 3) providing a correct answer for the attention check item; and 4) from mainland China. Afterward, a total of 27542 participants were left for the analyses (11681 men and 15861 women). Participants' ages ranged from 14 to 79 years old with a mean age of 25.14 ($SD = 8.32$). The sample included 16096 students (6103 men and 9993 women; Mean age = 20.34 years, $SD = 2.57$) and 11446 non-students (5578 men and 5868 women; Mean age = 31.91 years, $SD = 8.88$).

Procedure and measures

All participants completed questions regarding demographic information first, including gender, age, urban or rural residency, and SES of their family and so on. They then proceeded to report their objective status of being threatened by COVID-19, perceived threat from COVID-19, and tendency of seeing meaning in negative experiences, among other measures unrelated to the present study. In the middle of the survey, we included an attention check item: “Please choose option 6 for this item (1 = *strongly disagree*; 7 = *strongly agree*)”. Participants who did not provide a correct answer on this item were deemed as careless and therefore excluded from formal analyses (Meade & Craig, 2012).

Threat condition To assess participants’ objective status of being threatened, we asked them to indicate whether they were currently infected ($N = 147$, including 108 men and 39 women), suspected-infected ($N = 206$, including 159 men and 47 women), in close contact with the infected ($N = 181$, including 110 men and 71 women), living in a neighborhood with confirmed infected ($N = 7445$, including 3390 men and 4055 women), or have nothing to do with the infection ($N = 19563$, including 7914 men and 11649 women). We treated the first four groups as the high-threat group ($N = 7979$, 3767 men and 4212 women) and the last one as the low-threat group ($N = 19563$, 7914 men and 11649 women).

Perceived Threat. We used nine questions to assess participants’ subjective perceived threat. Participants indicated the extent to which they perceived the ongoing COVID-19 as a threat to themselves, their family, their friends, their relatives,

Chinese people in general, China, other countries, the world and humankind, respectively, on a 10-point Likert scale (1 = *not at all*, 10 = *extremely*). The Cronbach's alpha coefficient for these items was 0.95. We used the mean score across the 9 items as the index of perceived threat.

MINE. Due to the limited time we had in the survey, we decided to drop some repetitive items and gave participants a shorter version of the MINE scale in Chinese. This shorter version contained four items from the 9-item MINE scale used in Study 1. Sample items included: "I actively focus on the meaning of the stressful events that I encounter" and "I think that experiencing stressful events in life is meaningful". Participants indicated their agreement with each of the statements on a 6-point scale (1 = *Strongly disagree*, 6 = *Strongly agree*). The Cronbach's alpha coefficient for the 4-item MINE scale was 0.91.

Results and Discussion

Below, we analyzed data of student and non-student samples separately. In both analyses, we distinguished between high-threat and low-threat groups, and compared them on perceived threat and MINE scores, and examined the potential mediating role of perceived threat.

Results based on student sample

Perceived Threat As anticipated, the one-way ANCOVA showed that participants in the objectively high-threat group ($N = 4438$; $M = 6.12$, $SD = 1.87$) reported significantly higher perceived threat than those in the objectively low-threat group ($N = 11658$; $M = 5.69$, $SD = 1.96$), after controlling for their gender, age,

residency, and SES, $F(1, 16090) = 161.42, p < .001, 95\% \text{ CI } [.37, .50], d = 0.22$. This result confirmed that our operationalization of high- and low-threat was appropriate.

MINE As expected, the one-way ANCOVA confirmed that participants in the high-threat group ($M = 4.52, SD = 0.94$) scored higher on MINE than those in the low-threat group ($M = 4.47, SD = 0.96$), after controlling for their gender, age, residency, and SES, $F(1, 16090) = 6.45, p = .011, 95\% \text{ CI } [.01, .08], d = 0.05$, indicating that participants under high-threat drew more meaning from negative experiences.

Mediation analysis We further conducted a regression to examine whether the perceived threat mediates the effect of threat condition on MINE, controlling for the gender, age, residency, and SES (see *Figure 1*). Results showed that the effect of threat group (1 = *high-threat*, 0 = *low-threat*) on MINE ($\beta = 0.02, t = 2.54, p = .011$) became non-significant ($\beta = 0.01, t = 0.80, p = .43$) after controlling for the perceived threat ($\beta = 0.14, t = 17.59, p < .001$). We proceeded to test the indirect effect of threat group on MINE via the perceived threat using the PROCESS macro (Hayes, 2013; Model 4). The indirect effect was completely above zero (95% CI [.02, .04]), indicating that the perceived threat mediated the effect of threat condition on MINE.

Results based on non-student samples

Perceived Threat Consistent with expectation, the one-way ANCOVA showed that participants in the high-threat group ($N = 3541; M = 6.83, SD = 2.09$) reported greater perceived threat than those in the low-threat group ($N = 7905; M = 6.12, SD = 2.34$), after controlling for their gender, age, residency, and SES, $F(1, 11440) =$

166.35, $p < .001$, 95% CI [.50, .68], $d = 0.31$. Again, this result confirmed that our operationalization of high- vs. low-threat was appropriate.

MINE As expected, the one-way ANCOVA showed that participants in the high-threat group ($M = 4.75$, $SD = 0.95$) also scored higher on MINE than those in the low-threat group ($M = 4.68$, $SD = 1.04$), after controlling for their gender, age, residency, and SES, $F(1, 11440) = 12.50$, $p < .001$, 95% CI [.03, .11], $d = 0.07$, indicating that participants under high-threat tend to draw more meaning from negative experiences.

Mediation analysis We further conducted a regression to examine whether the perceived threat mediates the effect of threat condition on MINE, controlling for the gender, age, residency, and SES (see *Figure 1*). Results showed that the effect of objective threat (1 = *high-threat group*, 0 = *low-threat group*) on MINE ($\beta = 0.03$, $t = 3.54$, $p < .001$) became non-significant ($\beta = 0.01$, $t = 0.61$, $p = .54$) after controlling for the perceived threat ($\beta = 0.23$, $t = 25.02$, $p < .001$). We proceeded to test the indirect effect of threat condition on MINE via the perceived threat using the PROCESS macro (Hayes, 2013; Model 4). The indirect effect was completely above zero (95% CI [.05, .07]), indicating that the perceived threat mediated the effect of threat condition on MINE.

Figure 1. The mediating role of perceived threat on MINE based on student sample (*path values in italics*) and non-student sample.

Note. Path values represent standardized regression coefficients. The values outside and inside of the parentheses represent the direct effect of threat group on MINE with and without taking perceived threat into account, respectively.

* $p < .05$, *** $p < .01$.

Together, the analyses based on student and non-student samples produced consistent findings: Participants confronted with high objective threat from the COVID-19 reported greater subjective threat from the epidemic and higher tendency of seeing meaning in negative experiences in comparison with those confronted with low threat; Moreover, the subjective threat fully mediated the effect of objective threat on MINE. These convergent results indicated that the threat imposed by COVID-19 made Chinese rely more on their cultural tradition of dialecticism (i.e., negative situations also have positive implications), which is manifested as enhanced MINE.

General Discussion

Meaning making is a useful coping strategy in stressful or negative situations (Park, 2010; Park & Folkman, 1997). Seeing meaning in negative experiences (MINE), as a special case of meaning making, has been shown beneficial for Chinese people likely due to their culturally specific thinking styles (Khei, 2019). The present research examined whether the outbreak of COVID-19 could augment Chinese participants' tendency of MINE. In Study 1, we followed a large sample of college student and found that they exhibited higher MINE during the COVID-19 outbreak than three months before the outbreak. In Study 2, we investigated a large sample of students and non-students during the pandemic outbreak and found that, for both samples, participants in high-threat situations manifested higher MINE, and subjective threat mediated this effect. Together, the two studies with three samples provide consistent evidence that the outbreak of COVID-19 enhances Chinese's tendency of seeing meaning in negative experiences.

The findings contribute to our understanding of the psychological impacts of infectious diseases. Previous research has shown the extensive influences of infectious diseases on human behaviors, and the BIS theory has been proposed to understand these responses (Murray & Schaller, 2016). The present research is the first to show that threat of infectious diseases can boost the tendency of MINE, also providing novel evidence for the BIS theory. More importantly, these findings were obtained in a real-life disease outbreak situation, thus presenting high ecological validity. Given that MINE has been linked to dialectical thinking that characterizes Chinese culture (Khei, 2019; Peng & Nisbett, 1999), the present findings provide

support to the argument that the prevalence of infectious diseases would enhance adherence to cultural traditions (Murray & Schaller, 2016; Schaller et al., 2015).

The present findings also contribute to the literature of meaning making. According to the meaning making model (Park, 2010), when encountering stressful situations, people attempt to appraise the situations and make meaning out of them in order to reduce stress and better adjust to the events. The pandemic outbreak presents an extremely stressful situation for many people across the globe, including participants in our research. Consistent with the model, the present research indicates that Chinese people under such a threat manifest an increased tendency of drawing meanings from the situation and that the perceived threat can account for such an increase. The findings not only provide supportive evidence for the model but also shed light on an underlying mechanism.

The present research has practical implications for coping with threatening situations such as COVID-19. Prior research has shown that meaning making predicts better mental-health and well-being among patients with cancer (Boehmer et al., 2007; Lepore & Helgeson, 1998), and specifically, MINE is associated with positive coping strategy such as acceptance and positive framing (Khei, 2019). These findings suggest that the higher tendency of MINE may be beneficial for people by helping them manage adversity, and further restore a sense of significance and meaning in life (Heintzelman & King, 2014; Park, 2010). Unfortunately, due to the limited time we had for the online survey, we did not include measures that would allow us to examine any further benefits of MINE. This is a limitation of the present research, but

also a direction for future research. Future research also needs to examine whether threatening situations would enhance meaning making in other cultural contexts.

In conclusion, in response to a threatening situation such as COVID-19, Chinese participants increase their tendency of seeing meaning in negative experiences, which has implications in terms of how they combat the negative situation.

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