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# The impacts of a COVID-19 epidemic focus and general belief in a just world on individual emotions<sup>☆</sup>



Jin Wang<sup>a,b,c</sup>, Zhuo Wang<sup>b</sup>, Xiaojin Liu<sup>b</sup>, Xiaofan Yang<sup>b</sup>, Meilin Zheng<sup>b</sup>, Xuejun Bai<sup>a,b,c,\*</sup>

<sup>a</sup> Key Research Base of Humanities and Social Sciences of the Ministry of Education, Academy of Psychology and Behavior, Tianjin Normal University, China

<sup>b</sup> Faculty of Psychology, Tianjin Normal University, China

<sup>c</sup> Center of Collaborative Innovation for Assessment and Promotion of Mental Health, 300387, China

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## ABSTRACT

Whether the general belief in a just world (GBJW) can protect individual emotions during a major disaster is a matter of debate. This study conducted two experiments to explore this question during the COVID-19 epidemic. Experiment 1 ( $N = 92$ ,  $M_{age} = 22.52$ , 48.91% was male) manipulated the focus regarding the COVID-19 epidemic to investigate the impact of this focus on participants' emotions. The results showed that compared with the nonepidemic focus group, the epidemic focus group had higher negative emotions and lower positive emotions. Experiment 2 ( $N = 200$ ,  $M_{age} = 23.91$ , 49% was male) manipulated the epidemic focus and GBJW to investigate their effects on the participants' emotions. The results showed that high levels of GBJW reduced negative emotions and increased positive emotions regardless of whether the participants were focused on the epidemic. This study expands the influence of the GBJW on individual emotions and finds that the GBJW can protect individuals' emotions when they face a major social disaster. These findings imply that controlling people's intake of information on the epidemic can avoid their suffering from the vicarious traumatization caused by epidemic-related information overload and that improving the public's GBJW protects their mental health during an epidemic.

## 1. Introduction

Since the outbreak of the COVID-19 epidemic, the public has experienced high negative emotions and low positive emotions (Li, Wang, Xue, Zhao, & Zhu, 2020; Wang & Gao, 2020). The COVID-19 epidemic is a major social disaster that has led to psychological stress, which is a specific response to new, unpredictable and uncontrollable stimuli that may cause individuals harm (Dickerson & Kemeny, 2004). Psychological stress can reduce individuals' positive emotions and subjective well-being (Guo et al., 2020) and increase individuals' negative emotions and psychological conflicts (Liao et al., 2020; Sattler, Claramita, & Muskavage, 2018). Recent studies have focused on the relationship between the belief in a just world and individuals' emotions when they face psychological stress, in addition to other individual factors such as personality traits and emotion regulation strategies (Bibbey, Carroll, Roseboom, Phillips, & de Rooij, 2013; Seker, 2016; Villada, Hidalgo, Almela, & Salvador, 2014). Although studies have consistently indicated the positive effect of the personal belief in a just world on

individual emotions (e.g., Seker, 2016), whether the general belief in a just world can protect individual emotions during a major disaster (e.g., the COVID-19 epidemic) is a matter of debate (Carolyn, Michael, Alicia, Caroline, & Jennifer, 2020; Otto, Boos, Dalbert, Schöps, & Hoyer, 2006).

The theory on the belief in a just world indicates that individuals have a need to believe that they live in a just world. This belief is divided into the personal belief in a just world (PBJW) and the general belief in a just world (GBJW) (Lipkus, Dalbert, & Siegler, 1996). The PBJW refers to the belief that the world is fair to oneself; the GBJW refers to the belief that the world is fair to other people. For example, people feel that "I get what I deserve" when they have high PBJW, while they feel that "people get what they deserve" when they have high GBJW (Lipkus et al., 1996). Studies have consistently shown that the PBJW can reduce the risk of negative emotions and depression and improve positive emotions and subjective well-being when individuals encounter psychological stress (Jiang, Yue, Lu, Yu, & Zhu, 2016; Seker, 2016). However, most previous studies have focused on the influence of

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\* Corresponding author at: Key Research Base of Humanities and Social Sciences of the Ministry of Education, Academy of Psychology and Behavior, Tianjin Normal University, China.

E-mail address: [bxuejun@126.com](mailto:bxuejun@126.com) (X. Bai).

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the GBJW on victim blaming (Kogut, 2011), and the relationship among the GBJW, subjective well-being and emotion is controversial (Otto et al., 2006). Many studies have found that the GBJW can reduce depression and anxiety when individuals confront stressful events (Hua, Li, Zhang, & Wang, 2018; Xie, Liu, & Gan, 2011). However, some studies have found that when individuals experience natural disasters (e.g., earthquakes), the correlation between the GBJW and emotional happiness is weak and decreases over time (Wu, Wang, Zhou, Wang, & Zhang, 2009). Recent research has shown that the GBJW may be significantly negatively correlated with subjective well-being (Carolyn et al., 2020). The inconsistency of the previous research results may be due to the failure to consider the differing natures of psychological stress events.

Differences in interpersonal dependence and the controllability of psychological stress events may influence the effect of the GBJW on individual emotions (Jiang, Wang, & Zhang, 2013; Otto & Dalbert, 2005; Zhang & Zhang, 2015). When psychological stress events have low interpersonal dependence and controllability, such as earthquakes and floods, people's negative emotions may depend on how they view the disaster that happens to them. Therefore, in contrast with the protective effect of the PBJW on individual emotions because of the belief that the world is just for oneself, the effects of the GBJW on individual emotions have been relatively weak (Otto et al., 2006; Xie et al., 2011). However, some psychological stress events have high interpersonal dependency and controllability. For example, COVID-19 is highly infectious. If a person is infected with the virus and does not isolate himself in a timely manner, this person will pose a threat to the health of many people. In this context, individual health and safety depends on the health of other people, which strengthens the dependencies between people. At the same time, the COVID-19 epidemic is controllable because individuals can take precautions to avoid infection, for example, handwashing effectively, keeping a social distance, wearing masks, or even locking down to protect themselves (Wang et al., 2020). Isolation or lock downs established by governments are also considered to be effective precautionary measure to control the spread of an epidemic although they are experienced as taxing because it is difficult to estimate the time of the emergency period (Wang et al., 2020). Therefore, the belief that the world is fair to everyone (i.e., the GBJW) may protect an individual's emotions. Studies have shown that the GBJW among vulnerable groups has a significant positive correlation with happiness (Jiang et al., 2013) because vulnerable groups need to rely on the existing social system to continuously compensate for their disadvantages. If people's dependence on the system and their resulting institutional trust lead the GBJW to contribute to individual happiness and life satisfaction (Jiang et al., 2013; Zhang & Zhang, 2015), then can "person-to-person dependence" also cause the GBJW to have a positive effect on individual emotions during an epidemic? Previous studies have paid little attention to this issue, although some studies have found that the GBJW can improve interpersonal trust (Bègue, 2002; Otto & Dalbert, 2005). Therefore, in the face of psychological stress events with high interpersonal dependence, the GBJW may promote a sense of trust in others and a stable perception of the environment, which alleviates the negative impact of these events on individual emotions.

Some recent studies on large samples showed the emotional states of people only during the COVID-19 epidemic period, and most of them did not conduct a comparative analysis with the emotional states of people in a nonepidemic period (Geldsetzer, 2020; Man et al., 2020; Wang & Gao, 2020). Thus, these studies cannot explain the causal relationship between an epidemic focus and individual emotions. Moreover, nearly none of these studies responded to the debate whether the GBJW can protect individual emotions during a major social disaster (e.g., Guo et al., 2020). Therefore, the purpose of the present study was to explore the impacts of the COVID-19 epidemic and GBJW on individual emotions during a major social disaster. This study hypothesized that a focus on the COVID-19 epidemic may have a negative

impact on individual emotions, while the GBJW may alleviate this negative impact. Two experiments were conducted to test these hypotheses. Experiment 1 manipulated the epidemic focus to investigate the effect of an epidemic focus on individual emotions and explained the causal relationship between an epidemic focus and individual emotions. Experiment 1 hypothesized that an epidemic focus could increase negative emotions and decrease positive emotions compared with a nonepidemic focus. Furthermore, Experiment 2 manipulated the epidemic focus and GBJW to explore whether the GBJW can alleviate the negative effects of an epidemic focus on individual emotions. Experiment 2 hypothesized that the GBJW can reduce the negative emotions caused by a focus on the epidemic and can increase the positive emotions diminished by this focus.

## 2. Experiment 1

Experiment 1 manipulated the epidemic focus (epidemic focus group and nonepidemic focus group) through online experiments to investigate the effect of an epidemic focus on individuals' negative and positive emotions.

### 2.1. Method

#### 2.1.1. Participants

The participants were recruited by Questionnaire Star (<http://www.wjx.cn>), which is an effective and convenient online platform to collect data (Gu et al., 2019). Ninety-two valid experimental data were recovered (45 males; 51 undergraduates, 41 graduates; 78 students, 14 working young people; age range from 18 to 28 years; mean age = 22.52 years). All the participants were healthy Chinese citizens who were isolating at home (i.e., under lockdown). Specifically, the students studied online and the working people worked online at home. None came from a high-risk area of COVID-19 (e.g., Hubei Province in China as of February 2020), and none of their relatives were infected by or lost lives because of the COVID-19 epidemic.

#### 2.1.2. Design and procedure

The participants were randomly assigned to a focus condition in a between-subjects design, namely, an epidemic focus group ( $N = 47$ ) and a nonepidemic focus group ( $N = 45$ ). The gender, age and education of the participants but not employment status were matched so that the participants' demographic factors were balanced in the two experimental conditions. More precisely, the epidemic focus group included 21 males and 28 undergraduates with an age range from 18 to 28 years, while the nonepidemic focus group included 24 males and 23 undergraduates with an age range from 18 to 28 years.

The experiment was conducted online on February 23, 2020. The participants were informed that the study aimed to investigate people's social mentality. First, they read one of two focus materials and completed manipulation check items and a measurement of individual emotions. Then, they were instructed to respond to questions regarding a socially desirable response and the perceived credibility of the materials. Following these steps, the participants were debriefed and automatically given ¥5.00 by Questionnaire Star as thanks for their participation.

#### 2.1.3. Epidemic focus manipulation

By adopting the fake news material paradigm (Wang, Wang, & Kou, 2018) to manipulate the epidemic focus, we presented the "Sina.com news synthesis" mobile page to the participants to enhance the perceived authenticity of the news material. In the epidemic focus group, the news theme presented was "the total number of people diagnosed in the country has reached more than 70,000, the new pneumonia epidemic situation is grim". In the nonepidemic focus group, the popular science news theme presented was "What is the phototropism of plants?" To strengthen the effect of the manipulation, we instructed the

participants to cite examples in the news to illustrate the main ideas.

### 2.1.4. Measures

**Manipulation check items.** Three compiled epidemic focus items were used as the manipulation check (e.g., “I was thinking about the COVID-19 epidemic when reading the material”), Cronbach’s  $\alpha = 0.94$ . Due to the possible influence of the trustworthiness of the materials on the manipulation effects, one item was used to measure the trustworthiness of the materials on a 7-point scale (1 = *do not trust at all* to 7 = *trust completely*). The ratings were significantly above the scale’s midpoint of 4, which indicates that the materials were trusted,  $M_s > 4.86$ ,  $SD_s < 1.34$ ,  $t_s > 4.70$ ,  $p_s < 0.001$ , Cohen’s  $d_s > 0.97$ .

**Individual emotions.** A revised Positive and Negative Affect Scale (PANAS, Huang, Yang, & Ji, 2003) that has often been used to measure general individual emotions under normal conditions combined with a measurement of individual emotions during the COVID-19 epidemic period (Guo et al., 2020; Wang & Gao, 2020) were used, and 10 emotion words were selected in this experiment. The negative emotion words included anger, worry, sadness, fear, irritability, tension, depression and anxiety; the positive emotion words included calmness and optimism. The participants were asked to respond to the question, “After reading the news, to what extent are you experiencing the following emotions at this moment?” The responses were given on a 7-point scale, and a higher score represented a stronger emotional experience. The reliability of this scale was good (for negative emotion, Cronbach’s  $\alpha = 0.91$ ; for positive emotion, Cronbach’s  $\alpha = 0.60$ ).

**Socially desirable responding (SDR).** Because of the possible influence of socially desirable responding on individual emotions, an SDR scale with 6 items was used (Chinese version of Marlowe-Crowne Social Desirability scale, MCSD, Yang, 2004), for example, “When you make a mistake, you always admit it”, Cronbach’s  $\alpha = 0.72$ .

All of the variables (manipulation check, individual emotions and SDR) were measured on a 7-point scale (1 = *do not agree at all* to 7 = *agree completely*).

## 2.2. Results

### 2.2.1. Manipulation check

The results of the univariate analysis of variance showed that after controlling for the demographic variables (gender, age, education and employment status) and SDR ( $F_s < 2.48$ ,  $p_s > 0.11$ ), the manipulation check for the epidemic focus was effective. The epidemic focus score was significantly higher in the epidemic focus group ( $M = 5.91$ ,  $SD = 1.16$ ) than in the nonepidemic focus group ( $M = 1.81$ ,  $SD = 1.18$ ),  $F(1, 84) = 252.93$ ,  $p < 0.001$ ,  $\eta_p^2 = 0.75$ .

### 2.2.2. Effect of the epidemic focus on individual emotions

Regarding negative emotions, the results of the univariate analysis of variance showed that after controlling for the effects of the demographic variables and SDR that were considered to be the covariates on negative emotions ( $F_s < 1.82$ ,  $p_s > 0.18$ ), negative emotion was significantly higher in the epidemic focus group ( $M = 3.54$ ,  $SD = 0.88$ ) than in the nonepidemic focus group ( $M = 1.60$ ,  $SD = 0.89$ ),  $F(1, 84) = 94.96$ ,  $p < 0.001$ ,  $\eta_p^2 = 0.53$ . This indicates that when the participants paid more attention to the epidemic situation, their negative emotions were higher (Fig. 1).

Regarding positive emotions, the results of the univariate analysis of variance showed that after controlling for the demographic variables and SDR that were considered to be covariates ( $F_s < 3.54$ ,  $p_s > 0.06$ ), the positive emotion was marginally significantly lower in the epidemic focus group ( $M = 4.17$ ,  $SD = 1.23$ ) than that in the nonepidemic focus group ( $M = 4.70$ ,  $SD = 1.23$ ),  $F(1, 84) = 2.90$ ,  $p = 0.09$ ,  $\eta_p^2 = 0.03$ . The effects of the epidemic focus on calmness and optimism were examined separately. The results showed that after controlling for the demographic variables ( $F_s < 4.27$ ,  $p_s > 0.04$ ) and social approval  $F(1, 84) = 0.08$ ,  $p = 0.78$ ;  $F(1, 84) = 4.45$ ,  $p = 0.04$ , the epidemic focus

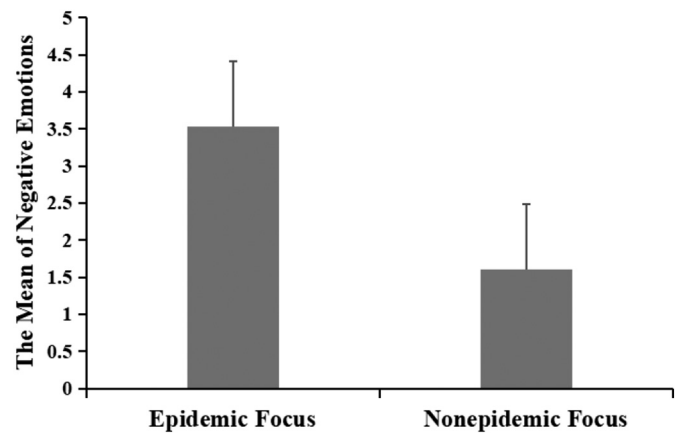


Fig. 1. Effect of the epidemic focus on negative emotions in Experiment 1.

did not differ significantly for optimism,  $M = 4.07$ ,  $SD = 1.83$ ;  $M = 4.27$ ,  $SD = 1.67$ ;  $F(1, 84) = 0.03$ ,  $p = 0.87$ , but it differed significantly for calmness. The calmness of the epidemic focus group ( $M = 4.24$ ,  $SD = 1.57$ ) was significantly lower than the calmness of the nonepidemic focus group ( $M = 5.13$ ,  $SD = 1.36$ ),  $F(1, 84) = 8.35$ ,  $p < 0.01$ ,  $\eta_p^2 = 0.09$ , which indicated that when the participants’ attention on the epidemic situation was higher, their calmness was lower (Fig. 2).

## 2.3. Discussion

Previous studies have found that individuals have higher negative emotions (e.g., anxiety, fear and depression) and lower positive emotions (e.g., calmness) during the COVID-19 epidemic (Man et al., 2020; Wang & Gao, 2020). This experiment provided a causal explanation for the epidemic focus and individual emotion and found that an epidemic focus significantly increased negative emotions and significantly decreased positive emotions. Although all participants in Experiment 1 were healthy and isolating at home (i.e., under lockdown) during the epidemic period, whether they paid attention to the COVID-19 epidemic had a significant impact on their emotions. This indicated that the change in individual emotions was affected by their epidemic focus: when the participants paid more attention to the epidemic, their negative emotions were higher, and their positive emotions (especially calmness) were lower. This may be the reason for the previous findings that when COVID-19 was closer to the participants, their anxiety and anger were stronger (Huang, Xu, & Liu, 2020). Therefore, by controlling the focus as a way to regulate their perception regarding the epidemic, individuals can regulate their emotions during the epidemic

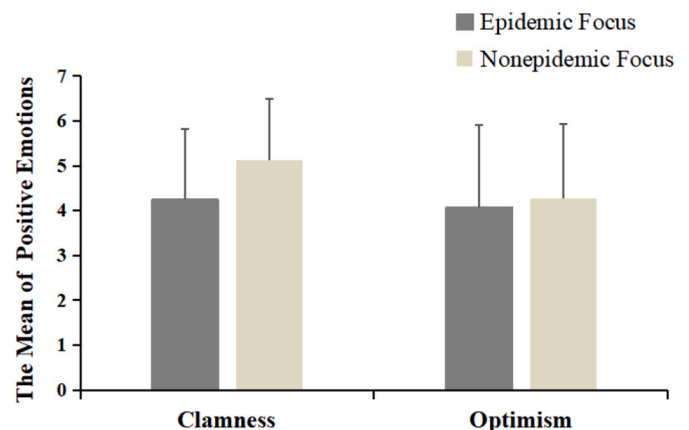


Fig. 2. Effect of the epidemic focus on positive emotions in Experiment 1.

(Geldsetzer, 2020; Man et al., 2020). Given that focusing on the epidemic influences emotions, is this relationship affected by the GBJW?

### 3. Experiment 2

Experiment 2 manipulated the epidemic focus and GBJW through online experiments to examine the interaction effect between them on individual emotions. The purpose of Experiment 2 was to explore whether the GBJW can reduce the negative emotions caused by a focus on the epidemic and can increase the positive emotions diminished by this focus.

#### 3.1. Participants

The participants were recruited online the same as in Experiment 1. Two hundred valid data were recovered (98 males; 104 undergraduates and 96 graduates; 117 students and 83 working young people; age range from 18 to 36 years; mean age = 23.91 years). All the participants were healthy Chinese citizens who were isolating at home (i.e., under lockdown). Specifically, the students studied online and the working people worked online at home. None came from a high-risk area of COVID-19 (e.g., Hubei Province in China as of March 2020), and none of their relatives were infected by or lost lives because of the COVID-19 epidemic.

#### 3.2. Design and procedure

We randomly assigned the participants to one of four experimental conditions in a between-subjects design: 2 (focus: epidemic focus or nonepidemic focus)  $\times$  2 (GBJW: high GBJW or low GBJW). Each condition had 50 participants. The gender, age, education and employment status of the participants were matched so that the demographic factors were balanced under the four experimental conditions. The “epidemic focus + high GBJW” group included 25 males, 27 undergraduates and 30 students, with an age range from 19 to 30 years. The “epidemic focus + low GBJW” group included 23 males, 24 undergraduates and 30 students, with an age range from 18 to 29 years. The “nonepidemic focus + high GBJW” group included 24 males, 26 undergraduates and 28 students, with an age range from 19 to 36 years. The “nonepidemic focus + low GBJW” group included 26 males, 27 undergraduates and 29 students, with an age range from 18 to 30 years.

Experiment 2 was conducted online from March 4 to 6, 2020. A pretest ( $N = 67$ ) was used to test the validity of the experimental materials for the epidemic focus and GBJW manipulation. The participants were informed that this experiment aimed to investigate people's social mentality. First, the participants read one of four materials and completed manipulation check items and a measurement of individual emotions. Then, they were instructed to respond to the SDR and perceived credibility of the materials. Finally, the participants were debriefed and automatically given ¥15.00 by Questionnaire Star as thanks for their participation.

#### 3.3. Epidemic focus and GBJW manipulations

By using the fake news material paradigm (Wang et al., 2018), the participants were presented with a mobile version of “Sina.com news synthesis”. For the “epidemic focus + high GBJW” group, the news topic was “good protection from infection is what people deserve” (February 25, 2020 at 19:30). The subject for the “epidemic focus + low GBJW” group was “being well protected but infected is not what people deserve (for example, being infected by asymptomatic people)” (February 25, 2020 at 19:30). For the “nonepidemic focus + high GBJW” group, the news topic was “internship work efforts that are rewarded is what people deserve” (November 4, 2019 at 19:30). For the “nonepidemic focus + low GBJW” group, the theme of the news was “hard internship work that is not rewarded is not what people deserve”

(November 4, 2019 at 19:30).

#### 3.4. Measures

Manipulation check items. The manipulation check of the epidemic focus was the same as in Experiment 1 (Cronbach's  $\alpha = 0.92$ ). The manipulation check was conducted by using a GBJW scale (Lipkus et al., 1996) with two items (e.g., “the world treats people fairly”,  $r = 0.42$ ,  $p < 0.01$ ). One item measured the trustworthiness of the materials on a 7-point scale (1 = *do not trust at all* to 7 = *trust completely*). The ratings were significantly above the scale midpoint of 4, which indicated that the materials were trusted,  $M_s > 4.71$ ,  $SD_s < 1.12$ ,  $t_s > 2.78$ ,  $p_s < 0.05$ , Cohen's  $d_s > 0.96$ .

The items used to measure individual negative emotions (Cronbach's  $\alpha = 0.91$ ) and SDR (Cronbach's  $\alpha = 0.72$ ) were the same as those used in Experiment 1. One item (i.e., calmness) was used to measure individual positive emotion. All of the variables were measured on a 7-point scale (1 = *do not agree at all* to 7 = *agree completely*).

#### 3.5. Results

##### 3.5.1. Pretest: manipulation check

The results of the univariate analysis of variance indicated that after controlling for the demographic variables (gender, age, education, and employment status) and SDR ( $F_s < 3.11$ ,  $p_s > 0.08$ ), the manipulation check of the epidemic focus was successful, and the scores of epidemic focus ( $M = 5.74$ ,  $SD = 1.41$ ) in the epidemic situation focus group were significantly higher than the scores in the nonepidemic focus group ( $M = 1.87$ ,  $SD = 1.32$ ),  $F(1, 60) = 118.71$ ,  $p < 0.001$ ,  $\eta_p^2 = 0.67$ . Similarly, the manipulation check of the GBJW was valid. After controlling for the demographic variables and SDR ( $F_s < 4.68$ ,  $p_s > 0.04$ ), the scores of the GBJW in the high GBJW group ( $M = 5.55$ ,  $SD = 1.10$ ) were significantly higher than these scores in the low GBJW group ( $M = 4.51$ ,  $SD = 1.37$ ),  $F(1, 60) = 13.11$ ,  $p < 0.01$ ,  $\eta_p^2 = 0.18$ .

##### 3.5.2. The effects of the epidemic focus and GBJW on negative emotions

The results of the univariate analysis of variance with individual negative emotion as the dependent variable showed that after controlling for the demographic variables and SDR that were considered to be covariates ( $F_s < 3.88$ ,  $p_s > 0.05$ ), the main effect of epidemic focus was significant, and the negative emotion was significantly higher in the epidemic focus group ( $M = 3.11$ ,  $SD = 1.13$ ) than in the nonepidemic focus group ( $M = 2.75$ ,  $SD = 1.29$ ),  $F(1, 191) = 5.36$ ,  $p < 0.05$ ,  $\eta_p^2 = 0.03$ . More precisely, four negative emotions (i.e., worry, sadness, fear and tension) were significantly positively affected by the epidemic focus,  $F_s > 4.15$ ,  $p_s < 0.05$ . The main effect of the GBJW was also significant, and the negative emotion was significantly lower in the high GBJW group ( $M = 2.51$ ,  $SD = 1.17$ ) than in the low GBJW group ( $M = 3.34$ ,  $SD = 1.13$ ),  $F(1, 191) = 26.15$ ,  $p < 0.001$ ,  $\eta_p^2 = 0.12$ . More precisely, seven negative emotions (i.e., anger, worry, sadness, fear, irritability, tension and anxiety) were significantly negatively affected by the GBJW,  $F_s > 8.02$ ,  $p_s < 0.01$ . However, the interaction between the epidemic focus and GBJW was not significant,  $F(1, 191) = 1.96$ ,  $p = 0.16$ ,  $\eta_p^2 = 0.01$ . The results showed that a high GBJW decreased negative emotions not only in the nonepidemic focus group ( $M = 2.21$ ,  $SD = 1.13$ ;  $M = 3.30$ ,  $SD = 1.22$ ;  $F(1, 93) = 19.60$ ,  $p < 0.001$ ,  $\eta_p^2 = 0.17$ ) but also in the epidemic focus group ( $M = 2.82$ ,  $SD = 1.14$ ;  $M = 3.40$ ,  $SD = 1.05$ ;  $F(1, 93) = 7.09$ ,  $p < 0.01$ ,  $\eta_p^2 = 0.07$ ) (Fig. 3).

##### 3.5.3. The effects of the epidemic focus and GBJW on calmness

The results of the univariate analysis of variance with calmness as the dependent variable show that after controlling for the demographic variables and SDR that were considered to be covariates ( $F_s < 1.17$ ,  $p_s > 0.28$ ), the main effect of the GBJW was significant. The

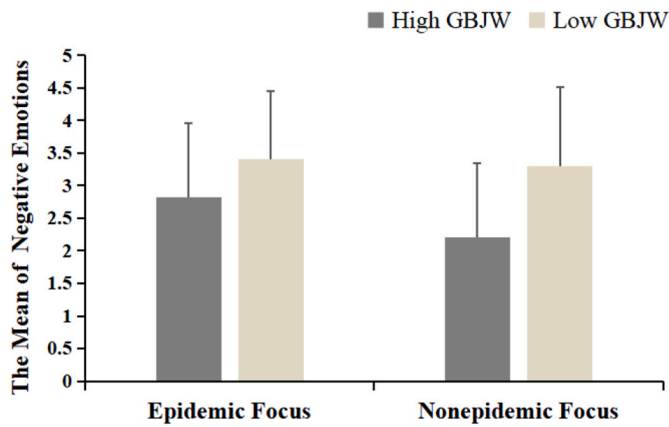


Fig. 3. The negative emotions of participants under the four experimental conditions in Experiment 2.

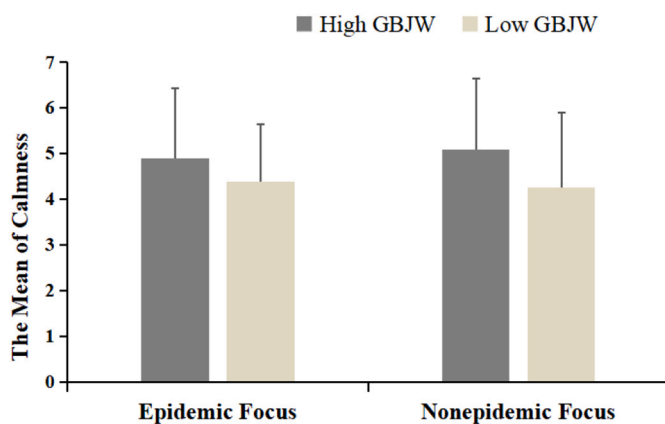


Fig. 4. The calmness of participants under the four experimental conditions in Experiment 2.

participants reported a higher GBJW in the high GBJW group ( $M = 5.00$ ,  $SD = 1.54$ ) than in the low GBJW group ( $M = 4.32$ ,  $SD = 1.45$ ),  $F(1, 191) = 10.27$ ,  $p < 0.01$ ,  $\eta_p^2 = 0.05$ . However, neither the main effect of the epidemic focus nor the interaction between the epidemic focus and GBJW was significant,  $F(1, 191) = 0.008$ ,  $p = 0.93$ ,  $\eta_p^2 < 0.001$ ;  $F(1, 191) = 0.83$ ,  $p = 0.37$ ,  $\eta_p^2 = 0.004$ . The results showed that a high GBJW improved the calmness of not only the nonepidemic focus group ( $M = 5.10$ ,  $SD = 1.54$ ;  $M = 4.26$ ,  $SD = 1.63$ ;  $F(1, 93) = 7.19$ ,  $p < 0.01$ ,  $\eta_p^2 = 0.07$ ) but also the epidemic focus group ( $M = 4.90$ ,  $SD = 1.54$ ;  $M = 4.38$ ,  $SD = 1.26$ ;  $F(1, 93) = 2.87$ ,  $p = 0.09$ ,  $\eta_p^2 = 0.03$ ) (Fig. 4).

### 3.6. Discussion

First, the results of Experiment 2 regarding the increase in negative emotion were consistent with the results of Experiment 1, which suggested that when the participants had a greater focus on the epidemic situation, they had more negative emotions. Experiment 2 found that when the participants had a higher GBJW, their negative emotion was lower, and their calmness was higher. As expected, the protective effect of the GBJW on individual emotions was still effective during the period of epidemic focus and provided a psychological buffer and protection for people who suffered from disasters (Zhou & Guo, 2013).

## 4. General discussion

This study explored the effects of an epidemic focus and the GBJW on emotions through two experiments. The results show that compared

with the participants in the nonepidemic focus group, the participants in the epidemic focus group reported higher levels of negative emotions (e.g., worry and fear) and lower levels of positive emotions (e.g., calmness). The GBJW could alleviate the negative effects of an epidemic focus on individual emotions. Compared with the participants in the low GBJW group, the participants in the high GBJW group presented lower levels of negative emotions and higher levels of positive emotions regardless of whether they were focused on the epidemic.

### 4.1. Epidemic focus and individual emotions

Since the outbreak of COVID-19, many surveys have shown that people are experiencing high levels of negative emotions, such as fear, anxiety and anger (Huang et al., 2020; Man et al., 2020; Wang & Gao, 2020). The results of the two experiments in this study show a significant causal relationship between an epidemic focus and individual emotions, and changes in individual emotions during the epidemic are affected by an epidemic focus. An epidemic focus leads to higher negative emotions and lower positive emotions (especially calmness). Moreover, the effect of an epidemic focus on individual emotions is not affected by the type of epidemic information received. The epidemic focus group experienced higher negative emotions than the non-epidemic focus group whether the news information was positive (e.g., recommendations for effective protection by experts) or negative (e.g., many medical staff have been infected during the epidemic period). The cognitive appraisal theory of emotion holds that people must constantly evaluate the relationship between stimulus events and their own interests (Castellanos, Rodríguez, Castro, & Gutierrez-Garcia, 2018). Individuals constantly consider the possibility that the COVID-19 epidemic poses a threat to them (Huang et al., 2020). Although many positive events have occurred during the epidemic, the negative impact of the epidemic cannot be offset. Therefore, we need to be rational about the epidemic and control our intake of information concerning it to avoid suffering from the vicarious traumatization caused by epidemic-related information overload (Pihkala, 2019). In addition, Experiment 2, which was conducted one week after the first experiment, found that calmness did not differ significantly between the epidemic focus and nonepidemic focus groups. This may be because the epidemic situation in China has improved; therefore, people's mentality became more positive one week after the end of Experiment 1 (Wang, 2020).

### 4.2. The protective effect of GBJW

This study found that the GBJW can protect individuals' emotions when they faced a major social disaster, such as the COVID-19 epidemic. The results indicated that compared with the participants in the low GBJW group, the participants in the high GBJW group presented lower levels of negative emotions and higher levels of positive emotions regardless of whether they were focused on the epidemic. This finding was different from the results of previous studies (Carolyn et al., 2020; Wu et al., 2009). The stress from the COVID-19 epidemic, which is a major catastrophic social event, is different from the psychological stress measured in previous studies (e.g., earthquake, Wu et al., 2009) and is dependent on interpersonal relationship cooperation and trust. The collectivist culture in China strengthens not only interpersonal dependence but also the relationship between the GBJW and PBJW (Carolyn et al., 2020; Wu et al., 2011), which may make the GBJW play a buffering and protective role in the negative effects of psychological stress on individual emotions. This study found that the effect of the GBJW on emotions was consistent regardless of whether the participants were focused on the epidemic. This result suggests that we need to focus on cultural backgrounds and pay attention to cultural differences in individual emotions in relation to psychological stress when exploring the effect of the GBJW (Carolyn et al., 2020). At the same time, most previous studies have explored the problems related to the GBJW and emotions (e.g., depression and anxiety) in the absence of

major catastrophic social events (Hua et al., 2018). This study expands the influence of the GBJW on individual emotions: when facing a major social disaster such as the COVID-19 epidemic, the GBJW can still protect individual emotions.

Moreover, individuals with a higher GBJW believe that the society in which they live is fair (Jiang et al., 2013; Zhang & Zhang, 2015). They trust others more (Bègue, 2002; Otto & Dalbert, 2005) and believe that with the joint efforts of other people and themselves, they will overcome disasters and prevail; thus, this perspective benefits the positive emotions of these individuals. During the COVID-19 epidemic, the square cabin hospital doctors and patients performed a square dance together in China, which shows mutual trust and support in the doctor-patient relationship, which may be related to higher GBJW. Therefore, to confront the epidemic, the government should help the public increase their sense of justice by commending medical staff, controlling prices, cracking down on people making a fortune from a disaster in the country, and actively reporting model cases of interpersonal trust (e.g., examples of people fighting the epidemic together). Furthermore, it is important to enhance the public's GBJW for the sake of their mental health during the epidemic period.

## 5. Limitations and future directions

Despite its strengths, this study also has limitations. First, the study sample was limited to students and young people who were just graduating and starting their careers with a mean age range of 22–24 years, which may limit the generalization of the findings to the elderly and to children. Therefore, future research could include people in older and younger stages of development to test the stability and applicability of these findings. Moreover, the control of possible interference variables in this study was insufficient. For example, the study did not collect information on whether the participants lost their job due to the COVID 19 epidemic and did not consider the change in the time, place, and severity of COVID-19, which may influence individual emotions.

Additionally, future research should explore the process whereby the GBJW influences individual emotions during the epidemic period and examine whether interpersonal trust, the environmental stability perception and other factors could be effective mediators. Furthermore, based on the arguments about the influence of the GBJW on victim blaming (Kogut, 2011), future studies should consider whether the role of the GBJW in blaming victims (e.g., infected persons with COVID-19) will affect individual emotions during the epidemic.

## 6. Conclusion

This research found that the GBJW can protect individuals' emotions when they faced a major social disaster such as the COVID-19 epidemic. The GBJW can reduce the individual negative emotions evoked by an epidemic focus and increase the positive emotions diminished by the epidemic.

## CRedit authorship contribution statement

**Jin Wang:** Conceptualization, Methodology, Writing - original draft. **Zhuo Wang:** Formal analysis, Investigation. **Xiaojin Liu:** Formal analysis, Investigation. **Xiaofan Yang:** Investigation, Resources. **Meilin Zheng:** Investigation, Resources. **Xuejun Bai:** Methodology, Writing - review & editing.

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