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The relationship between risk perception of COVID-19 and willingness to help: A moderated mediation model

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ARTICLE INFO

Keywords:
Risk perception of COVID-19  
Interpersonal alienation  
Emotion regulation strategies  
Willingness to help  
Chinese college students

ABSTRACT

Previous studies have revealed that situational risk factors have a significant influence on the willingness to help. Amidst the COVID-19 pandemic, maybe risk perception of COVID-19 is also correlated to the willingness to help. This study examined the mediating effect of interpersonal alienation and the moderating effect of cognitive reappraisal and expressive suppression in the relationship between risk perception of COVID-19 and willingness to help. Data from a large sample of Chinese college students (N = 2, 163) completed the measures of risk perception of COVID-19, willingness to help, interpersonal alienation, emotion regulation strategies including cognitive reappraisal and expressive suppression. The results indicated that the risk perception of COVID-19 negatively correlated to willingness to help. Interpersonal alienation partially mediated the link between risk perception of COVID-19 and willingness to help. College students’ expressive suppression moderated the associations between interpersonal alienation and willingness to help. And who adopted more expressive suppression, the connection between interpersonal alienation and willingness to help was weaker compared to students who reported less expressive suppression. But cognitive reappraisal did not moderate the relationship between risk perception of COVID-19 and interpersonal alienation. Implications of the present paper for theory and practice are discussed.

1. Introduction

In 2020, COVID-19 broke out in China, which is more contagious than SARS and other infectious diseases (Liu et al., 2020). On January 30, 2020, COVID-19 was listed as a public health emergency of international concern by the World Health Organization (WHO).

Confronted with the COVID-19, residents have taken action to interpret this sentence, “when trouble occurs at one spot, help comes from all quarters”. Coincided with the Chinese New Year holiday, both production and transportation of supplies across the country initially came to a standstill, intensifying a temporary shortage of emergency supplies in the early stages. The communities and the residents also actively help to solve the temporary lack of materials such as medical care. The helping behavior in the face of COVID-19 is even more valuable, which can help alleviate the critical epidemic situation. Helping behavior is closely related to altruistic behavior and prosocial behavior.

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https://doi.org/10.1016/j.childyouth.2022.106493
Received 20 September 2020; Received in revised form 18 March 2021; Accepted 1 April 2022
Available online 6 April 2022
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Most previous studies on prosocial behavior and altruistic behavior have focused on helping behavior (Busching & Krahé, 2020; Huang, Shi, & Liu, 2018). Therefore, this paper does not make a strict distinction between the three. Helping behavior refers to giving resources (i.e., love, information, money) to others or acting altruistically in general (Foa & Foa, 1974; Jia, Zhong, & Xie, 2020), which can help to improve individual positive emotions and psychosocial adjustment (Lyubomirsky, Dickerhoof, Boehm, & Sheldon, 2011; Liu, 2018; Wei, Lv, Ji, Chen, & Zhang, 2013) and promote social welfare awareness and social harmony (Godfrey, 2005). Eisenberg (2014) proposed that helping behavior occurs through three stages: the stage of focusing on the needs of others, the stage of establishing the will to help others, and the stage of linking intention and helping behavior. Willingness to help in the second stage is an individual’s behavioral intention to help others under certain circumstances, which is an internal manifestation and precondition for helping behavior (Fu, 2006; Xu, 2018; Min, Zheng, Guo, Lin, & Zhang, 2013). As a dynamic system of helping behavior (Eisenberg, 2014), willingness to help is positively related to helping behavior (Yan, Zhang, & Yang, 2012). Also, measuring an individual’s helping behavior requires setting up various real situations, which is exceedingly difficult during COVID-19. Given this situation, we choose willingness to help, which is a prerequisite for helping behavior. For Chinese college students in early adulthood, it is almost the first time they have experienced a public health emergency like COVID-19. Focusing on the college students’ willingness to help under the COVID-19 epidemic situation can provide valuable advice for teenagers’ healthy development and better social adaptation.

Due to the infectivity of COVID-19, people’s daily lives were exposed to many risks. There is no doubt that the entire country is shrouded in an atmosphere of tension and pressure during the period of the COVID-19 pandemic. Studies have shown that in risky situations, the individuals’ willingness to help others will be significantly reduced (Min, Zheng, Guo, Lin, & Zhang, 2013). During the COVID-19 epidemic, risk perception of COVID-19 may affect willingness to help. Although no research to date has explored the relationship between risk perception of COVID-19 and willingness to help, we infer that there is a significant relationship between the two based on previous research and theories. Therefore, this study aims to investigate the relationship between risk perception of COVID-19 and willingness to help and explore the underlying mediating and moderating mechanisms in this association.

1. Risk perception of COVID-19 and willingness to help

Risk perception refers to people’s subjective judgments about the likelihood of negative occurrences such as injury, illness, disease, and death. It includes two main dimensions: the cognitive dimension, which relates to how much people know about and understand risks, and the emotional dimension, which relates to how they feel about them (Chen, Jie, & Wang, 2017; Paek & Hove, 2017). Risk perception will be affected by subjective factors such as external information and an individual’s education (Liu, Zhou, & Huang, 2006). The risk situation factors have a significant influence on individuals’ willingness to help others. More specifically, willingness to help others in the risk situation is significantly lower than that in the general case (Min, Zheng, Guo, Lin, & Zhang, 2012; Xia & Wang, 2015; Gong, 2019). According to the hierarchical theory of needs (Maslow, 1943), individuals pay attention to high-level needs only when they satisfy the low-level needs (such as security needs). During an epidemic, due to the infectiousness of COVID-19 and the temporary shortage of resources, although helping behavior can benefit society and others, it also carries the risk of a reduced quality of life or even life security. Individuals with high-risk perception of COVID-19 have a lower sense of security and a greater need for safety, which may weaken the willingness and behavior to help others reflecting the higher needs (such as praise and respect from others). Thus, individual risk perception of COVID-19 under the influence of the COVID-19 epidemic may be negatively correlated to individuals’ helping behavior and willingness to help. We can also infer this relationship between risk perception of COVID-19 and willingness to help from another theory. From the point of a decision-making model, the helper will evaluate the external environment and their self-interests to decide whether to help others or not during the decision-making process (Latane, & Darley, 1968). It makes sense that with a high level of risk perception, individuals may assess that they need to pay a higher price if they help others, which may result in the reduction of willingness to help. During the outbreak of COVID-19, facing this risk event, if individuals are aware of a higher risk, such as the lack of medical resources and living resources, who will feel that the quality of life of the living environment decreased, which in turn needs them to pay a higher price if helping others. Therefore, although there is no empirical research to prove the relationship between risk perception of COVID-19 and willingness to help, we deduce from some theories and studies that the risk perception of COVID-19 may be negatively correlated with willingness to help (Hypothesis 1).

1.2. Interpersonal alienation as a mediator

It is likely, however, that the relationship between risk perception of COVID-19 and willingness to help is not a simple direct one. The study indicated that the mediating variables between risk perception of infectious disease and helping behavior (Li, Deng, Guo, & Zhang, 2019). According to the social-cognitive model (Lee & Lemyre, 2009), cognitive factors for risk (such as perceived probability and seriousness) may trigger individuals’ negative emotions, which in turn intensify the individuals’ avoidance response. In our study, risk perception of COVID-19 can be considered as cognitive factors for risk, willingness to help might belong to behavior propensity. And interpersonal alienation might be a complex negative emotion caused by changes and distance in interpersonal relationships including loneliness, alienation of relatives, and social isolation (Yang, Zhang, & Huang, 2002; Zhu, Shen, Zhou, & Yang, 2020). Based on the social-cognitive model (Lee & Lemyre, 2009), from the perspective of interpersonal relationships, the risk perception of COVID-19 is supposed to increase people’s interpersonal alienation, thus impact people’s willingness to interact which can reflect the degree of avoidance of interaction. COVID-19 is confirmed human-to-human transmission. If individuals have a higher risk perception of COVID-19, they will naturally stay away from everyone possible to carry the risk. Risk perception is rarely entirely rational. So, individuals’ exaggerated risk perception of COVID-19 will increase the social and psychological distance irrationally, diminishing trust, thus creating alienation in interpersonal communication which may reduce people’s willingness to help. Although not yet tested, it is reasonable to expect that interpersonal alienation acts as a mediator between risk perception of COVID-19 and willingness to help.

Studies have emphasized that risk perception positively correlated with negative emotions (Lee & Kim, 2013; Zhu & Liu, 2009; Zhang, 2011). Recently, by looking at people from 112 countries, the study indicated that higher risk perception of COVID-19 was significantly associated with more negative emotions (Han et al., 2021). According to the ABC theory of emotion (Ellis, 1991), faced with a certain induced activating event, individuals will produce relevant negative emotion, as a result of cognition particularly irrational beliefs rather than the external event.

During COVID-19, excessive risk perception would increase social distance (Xie, Liang, Dulebenets, & Mei, 2020) thereby increasing social distance (Pancani, L., Marinucci, M., Aureli, N., & Riva, 2020; Zhu, Zhang, Zhou, Li, & Yang, 2021). To think about alienation from the perspective of interpersonal relationships, interpersonal alienation is a complex negative emotion including loneliness, alienation of relatives, and social isolation (Zhu, Shen, Zhou, & Yang, 2020). Additionally, excessive risk perception of COVID-19 may be positively related to interpersonal alienation. COVID-19 is a highly contagious respiratory disease among people. Despite the protective effect of masks against the
virus, the shortage of masks cannot guarantee our safety in the early stage of the COVID-19 epidemic. There is no doubt that social interaction during the ongoing COVID-19 pandemic is at risk for COVID-19 infection. However, social distancing and frequent hand washing during the epidemic can largely prevent infection. If individuals overestimate the risk of the epidemic, they may have negative attitudes toward interpersonal contact and increase the social distance, thereby increasing interpersonal alienation. When evaluating environmental risk from the perspective of expected consequences, individuals have stronger negative emotions (such as worry and fear) (Bohm, 2003). From the perspective of the expected outcome, individuals with the high-risk perception of COVID-19 may be more resistant to interpersonal communication which may contain the potential risk of infection and hold a more negative attitude towards the interpersonal relationship, thereby increasing interpersonal alienation.

Studies have shown that interpersonal alienation has a significant negative predictive effect on helping behavior (Qiu & An, 2012; Hronung, 2010). Willingness to help which is an internal manifestation of helping behavior (Eisenberg, 2014) may be negatively related to interpersonal alienation. According to in-group favoritism (Masuda & Fujita, 2015), people have a positive attitude and stronger willingness to help the inner group members while in specific discrimination and hostility towards the outer group members. Interpersonal alienation mainly refers to a negative emotion with the lack of sense of belonging to the group (Zhang, 2011), which may lead to individuals isolating themselves from others (Jin et al., 2019) and seeing others as outgroup members. Due to group bias, individuals are more indifferent to outgroup members, and thus less willing to help them (Molenberghs & Louis, 2018).

In summary, excessive risk perception of COVID-19 may be positively correlated to interpersonal alienation, while interpersonal alienation may associate with the willingness to help negatively. Based on the studies above, we hypothesize that interpersonal alienation will mediate the relationship between risk perception of COVID-19 and willingness to help (Hypothesis 2).

1.3. Emotion regulation strategies as a moderator

Although risk perception of COVID-19 may decrease willingness to help through the mediating role of interpersonal alienation, not all individuals with a higher level of risk perception of COVID-19 and interpersonal alienation show less willingness to help. Thus, it is necessary to explore potential moderating variables that may regulate the relationship between risk perception of COVID-19 and interpersonal alienation and the association between interpersonal alienation and willingness to help. As a kind of negative emotion, interpersonal alienation has negative impacts on an individual’s physical and mental health (LI, Wu, & Li, 2020) as well as interpersonal relationships (Xie, 2020). It is necessary to take valid measures to regulate negative emotions as far as possible to alleviate the negative impact of the negative emotions and increase the willingness to help which helps the students to develop healthily and adapt to the needs of society.

Emotion regulation refers to the processes of influencing which emotions we have, when we have them, and how we experience and express them (Gross, 2002). Previous studies revealed that cognitive reappraisal and expressive suppression were the most commonly used and valuable emotion regulation strategies (Gross, 2001; Wang & Guo, 2003). Cognitive reappraisal is to change the understanding of a stimulus to alter its emotional impact (Nook, Bustamante, Cho, & Somerville, 2020). Previous studies showed that cognitive reappraisal was a positive emotional regulation strategy preceding the onset of negative emotions, which helps to reduce the generation of negative emotions and mental health (Spencer, Buchanan, & Masuda, 2020; Wang, Fan, & Zhu, 2020). During the COVID-19 outbreak, close interpersonal communication and contact pose the risk of contracting the disease, thereby implementing a policy of home quarantine, which increases the distance between people. All of these will increase individuals’ negative emotions toward interpersonal relationships (such as interpersonal alienation). However, cognitive reappraisal can help individuals reconsider the risk and policy, which may avoid the aggravation of interpersonal alienation as far as possible. Thus, interpersonal alienation may be negatively related to cognitive reappraisal. Based on the risk buffering model (Masten, 2001), protective factors may buffer the effect of risk factors. This study tested whether cognitive reappraisal as the protective factor could buffer the impact of risk perception of COVID-19 (risk factor) on interpersonal alienation. That is, cognitive reappraisal may interact with the risk perception of COVID-19 to affect college students’ interpersonal alienation. When an individual adapts more cognitive reappraisal, the effect of risk perception of COVID-19 on interpersonal alienation may be weakened. We hypothesize that the better use of cognitive reappraisal, the weaker the positive association of risk perception of COVID-19 with interpersonal alienation (Hypothesis 3).

Expressive suppression is, by definition, implemented following emotion generation and produces decreased expressive behavior, typically with little or no change in ongoing emotion experience (Gross, 2001; Goldin, McRae, & Ramel, 2008). Gross (2002) conducts the exploration of the impact of different strategies for emotional regulation on interpersonal connections. If people use expressive suppression, it is difficult for them to help and work with others. However, some studies have shown that the function of expression suppression is closely related to culture (Liu, Song, Gong, Ding, & Pan, 2016; Yuan et al., 2015). For Easterners, expression suppression was associated with better social functioning compared with Westerners (Butler, Lee, & Gross, 2007). Based on the “tick not itch” (風多不痛) model (Ye, Cheng, Gao, & Xia, 2019; Hu, 2017), under the interaction of two kinds of risk factors, risk factors will weaken the adverse impact of another risk factor. In our study, both interpersonal alienation and expressive suppression are risk factors for willingness to help. According to the “tick not itch” model, expressive suppression may interact with interpersonal alienation to affect college students’ willingness such that the negative link between interpersonal alienation and willingness to help is weaker when students use more expressive suppression. We hypothesize that the better the use of expressive suppression, the weaker the negative association of interpersonal alienation with the willingness to help (Hypothesis 4). To date, no research has examined cognitive reappraisal or expressive suppression as a moderator of the indirect relationships between risk perception of COVID-19 and willingness to help.

1.4. The present study

Based on the literature review, we proposed the following hypotheses (Fig. 1):

Hypothesis 1. Risk perception of COVID-19 is related to willingness to help.

Hypothesis 2. Interpersonal alienation will mediate the relationship between risk perception of COVID-19 and willingness to help.

Hypothesis 3. Cognitive reappraisal will moderate the relationship between risk perception of COVID-19 and interpersonal alienation.

Hypothesis 4. Expressive suppression will moderate the relationship between interpersonal alienation and willingness to help.

2. Method

2.1. Participants

Our study was approved by the Research Ethics Committee of the first author’s institution. We obtained consent from all participating college students before the data collection. A total of 2,163 students (73.2% female) anonymously completed the survey on measures including demographic variables, risk perception of COVID-19, interpersonal alienation, willingness to help, and emotion regulation
strategies. Among the total sample, 768 (35.5%) were first years, 557 (25.8%) were second years, 478 (22.1%) were third years, and 360 (16.6%) were fourth years. The mean age of the participants was 20.64 (SD = 1.61, range = 18–25).

2.2. Measures

2.2.1. Risk perception of COVID-19

Risk perception of COVID-19 was measured by a self-reported scale, which referred to the risk perception questionnaire (Shi et al., 2003). Participants rated 5 items (e.g., “You know the cause of COVID-19”) scored in reverse order on a five-point scale (1 = strongly disagree, 5 = strongly agree). Higher scores indicate a higher level of risk perception. In our study, Cronbach’s α for the risk perception of COVID-19 was 0.72. Furthermore, confirmatory factor analysis (CFA) suggested that all the two factors model fitted the data well: χ²/df = 1.76, TLI = 0.99, CFI = 0.99, RMSEA = 0.02, 90 %CI = [0.00, 0.05], SRMR = 0.01.

2.2.2. Willingness to help

Willingness to help was measured by a self-reported scale, which referred to the help tendency scale (Fu, 2006). Participants rated 8 items (e.g., “The area close to your city is very affected by COVID-19. What percentage of your allowance will you spend to help them? How long will you hold on?”) on a four-point scale, assessing three dimensions of spiritual support (3 items), money to support (2 items), and behavioral support (3 items). The higher the score, the stronger the willingness to help others. In our study, Cronbach’s α for willingness to help was 0.72. Furthermore, confirmatory factor analysis (CFA) suggested that all the three-factor model fitted the data well: χ²/df = 3.03, TLI = 0.98, CFI = 0.99, RMSEA = 0.03, 90 %CI = [0.02, 0.04], SRMR = 0.02.

2.2.3. Interpersonal alienation

Interpersonal alienation was measured by the interpersonal alienation scale, which was a dimension of the adolescent student alienation scale (Yang, Zhang, & Huang, 2002). Participants rated 15 items (e.g., “I feel distant from others”) on a seven-point scale (1 = strongly disagree, 7 = strongly agree) scale assessing three dimensions sense of loneliness (7 items), alienation between family members (4 items), and sense of social isolation (4 items). Additionally, there are three questions to be scored in reverse order. Higher scores indicate a higher level of interpersonal alienation. The scale has been used among Chinese college students with good reliability and validity (Sun, Bo, & Lu, 2020; Wang, Li, Wang, Shi, & Xiao, 2020; Zhu et al., 2019). In our study, Cronbach’s α for cognitive reappraisal was 0.84, and Cronbach’s α for expressive suppression was 0.75.

2.3. Procedure

Due to the ongoing issue with COVID-19, questionnaires were distributed, and data collected electronically on Survey Star (Changsha Ranxing Science and Technology, Shanghai, China) from March 16 to March 28, 2020, and all responses were anonymous. Researchers emphasized the authenticity, independence, and integrity of all answers to the participants. Participants completed the tests after informed consent was obtained from the schools, teachers, and participants. Participation in the study was entirely voluntary and no compensation was given for their participation.

2.4. Data analysis

First, descriptive statistics and Pearson correlations were calculated among the study variables. Second, the PROCESS macro for SPSS (Model 4) was applied to examine the mediating effect of interpersonal alienation (Hayes, 2017). Third, the PROCESS macro (Model 21) was applied to examine the moderating effect of emotion regulation strategies on the indirect links between the risk of COVID-19 and willingness to help. The bootstrap confidence intervals (CIs) determine whether the effects in Model 4 and Model 21 are significantly based on 5000 random samples (Hayes, 2017). An effect is regarded as significant if the CIs do not include zero. All study variables were standardized in Model 4 and Model 21 before data analyses.

3. Result

3.1. Preliminary analyses

Table 1 shows means, SDs, and Pearson correlations for the study variables. As the results showed, both willingness to help and cognitive reappraisal were negatively correlated with risk perception of COVID-19 (r = -0.12, p < 0.001 and r = -0.11, p < 0.001, respectively). On the contrary, both interpersonal alienation and expressive suppression were positively correlated with risk perception of COVID-19 (r = 0.19, p < 0.001 and r = 0.08, p < 0.001, respectively). In addition, willingness to help was negatively correlated with interpersonal alienation and expressive suppression (r = -0.30, p < 0.001 and r = -0.14, p < 0.001, respectively), and positively correlated with cognitive reappraisal (r = 0.15, p < 0.001). Interpersonal alienation was negatively correlated with cognitive reappraisal (r = -0.20, p < 0.001), and positively correlated with expressive suppression (r = 0.27, p < 0.001).

3.2. Testing for mediation effect

The result showed that risk perception of COVID-19 was negatively correlated with willingness to help supporting hypothesis 1 (β = 0.12, t = -5.43, p < 0.001, R² = 0.01). In Hypothesis 2, we assumed that
interpersonal alienation would mediate the relationship between risk perception of COVID-19 and willingness to help. This hypothesis was tested with Model 4 of the PROCESS macro (Hayes, 2017). As Table 2 shows, risk perception of COVID-19 was positively associated with interpersonal alienation ($\beta = 0.19, t = 8.95, p < 0.001$), which in turn was negatively related to willingness to help ($\beta = -0.29, t = -13.63, p < 0.001$). In the meantime, the negative direct association between risk perception of COVID-19 and willingness to help remained significant ($\beta = -0.06, t = -2.98, p = 0.003 < 0.01$). The result supported hypothesis 2. Interpersonal alienation partially mediated the relationship between risk perception of COVID-19 and willingness to help (indirect effect = -0.05, SE = 0.01, 95% CI = [-0.07, -0.04]). The mediation effect accounts for 46.42% of the total effect of risk perception of COVID-19 on willingness to help.

### 3.3. Moderated mediation effect analysis

To test the moderated mediation model, we used Model 21 of the SPSS macro-PROCESS compiled by Hayes (2017). The results of the emotion regulation strategies moderation test are shown in Table 3. The product (interaction term) of risk perception of COVID-19 and cognitive reappraisal did not have a significant predictive effect on interpersonal alienation. The product (interaction term) of interpersonal alienation and expressive suppression had a significant predictive effect on willingness to help ($\beta = 0.04, t = 2.46, p = 0.014 < 0.05$). In order to further portray the interaction, we conducted simple slope plots and calculated beta coefficients at $-1SD$ and $+1SD$ from the mean of expressive suppression (Fig. 2). The result of simple slope tests showed that for college students with a lower level of expressive suppression, the influence of interpersonal alienation on willingness to help had a steeper slope, meaning it was even more statistically significant ($\beta_{simple} = -0.32, p < 0.001$). For college students with a higher level of expressive suppression, the influence of interpersonal alienation on willingness to help was negative and statistically significant ($\beta_{simple} = -0.23, p < 0.001$).

The bias-corrected percentile bootstrap analysis further indicated that the indirect effect of risk perception of COVID-19 on willingness to help through interpersonal alienation was moderated by expressive suppression. Particularly, for college students with low expressive suppression, the indirect effect of risk perception of COVID-19 on willingness to help via interpersonal alienation was significant, $b = -0.05, SE = 0.01, 95% CI boot = [-0.08, -0.04]$. The indirect effect was also significant for college students with high expressive suppression, but weaker, $b = -0.04, SE = 0.01, 95% CI boot = [-0.06, -0.03]$. Results indicate that interpersonal alienation mediated the effect of risk perception of COVID-19 on willingness to help, and expressive suppression weakened the mediating effect of interpersonal alienation as well.

### 4. Discussion

A moderated mediation model was tested in our study to analyze the mechanisms underlying the association between risk perception of COVID-19 and willingness to help among Chinese college students. Overall, the result showed that the risk perception of COVID-19 was negatively related to willingness to help, and interpersonal alienation partially mediated this relationship. Furthermore, our findings...
contributed to the literature by testing a moderated mediation model, showing that the relation between interpersonal alienation and willingness to help was moderated by expressive suppression. The results are helpful to understand the psychological processes of how risk perception of COVID-19 weakens willingness to help among college students and has crucial implications for increasing their willingness to help during the pandemic.

4.1. The relationship between risk perception of COVID-19 and willingness to help

Results support hypothesis 1 that risk perception of COVID-19 was negatively related to willingness to help, consistent with the previous study on the relationship between risk perception and willingness to help others (Wilbanks, Matheson, Eubanks, & DeVietti, 2005). During the COVID-19 epidemic, risk perception of COVID-19 may be a crucial factor to explain why the willingness to help decreases. Also, the association can be deeply explained from the perspective of the costs and rewards of helping others. According to Homans’ exchange theory (Homans, 1974), any interpersonal relationship is an exchange relationship that contains rewards and costs. Surely, there are not only direct or indirect rewards such as social praise but also costs such as time and money for the helper. How to assess the rewards and costs affect the individual willingness to help and action. In the risk situation, the higher the level of risk perception, the higher the costs of helping others (Min, Zheng, Gao, Lin, & Zhang, 2013). Individuals incline to avoid costs rather than obtain rewards, even if the costs are the same as the rewards (Tversky & Kahneman, 1991). Compared with the positive emotions obtained by rewards, individuals produce more negative emotions when paying the same costs, so they are more inclined to avoid an equal amount of costs than to obtain rewards (Tversky & Kahneman, 1991). Faced with the COVID-19 epidemic, individuals with a higher level of risk perception may have to pay much higher costs (such as life risk) to help others that they are more likely to reduce willingness to help. Therefore, the higher the individual’s risk perception of COVID-19, the lower the willingness to help. Although risk perception has a small impact on willingness to help, it is still significant. On the one hand, small effect sizes may have important theoretical significance (Gall, Gall, & Borg, 2007). College students’ willingness to help is usually affected by a variety of factors. Although the effect is small, it supports the negative correlation between risk perception of COVID-19 and willingness to help, which is of theoretical significance. On the other hand, small effect sizes also have practical significance (Ellis, 2010). If a small effect may directly or indirectly lead to significant results (such as the willingness to help others), and if the population involved is relatively wide (Chinese college students), even if the effect is small, great attention should be paid to it.

4.2. The mediating role of interpersonal alienation

The present study tested the mediation process from risk perception of COVID-19 to interpersonal alienation, then to willingness to help. Risk perception of COVID-19 could promote activation of interpersonal alienation, which may weaken willingness to help. Otherwise, it was worth paying attention to interpersonal alienation, which partially mediated the relationship between risk perception of COVID-19 and willingness to help. In the meantime, the remaining direct and negative link between risk perception of COVID-19 and willingness to help may suggest that risk perception of COVID-19 still independently leads to the reduction of willingness to help.

For the first stage of the mediation process, the present study found that the risk perception of COVID-19 significantly facilitated the activation of interpersonal alienation. Consisted with the assessment excitation theory (Arnold, 1960), the generation of emotions is determined by the cognitive assessment of the situation. During the COVID-19 epidemic, because of person-to-person transmission, individuals may assess the risk of COVID-19 too high and be more proactive in avoiding interaction with others, thereby aggravating more interpersonal alienation which leads to a negative emotional impact on interpersonal relationships. Although the reduction of interactions contributes to curbing the spread of the virus (Cori, Bianchi, Cadum, & Anthons, 2020), it also increases loneliness (Zhang, 2015) and causes interpersonal alienation. Thus, the risk perception of COVID-19 is a risk factor for interpersonal alienation.

In the second stage of the mediation process, the present study found that interpersonal alienation was negatively related to willingness to help. As we know, the helpers must pay attention to help signals from others before generating the willingness to help (Eisenberg, 2014). With negative emotions, individuals may focus more on themselves and less on others (Jeon, Resnik, Fedor, & Kim, 2020; Salovey, 1992). Due to the negative sense of interpersonal alienation, it is not easy for individuals to recognize help signals from others which may hinder the willingness to help. Based on the construal level theory (Troepe & Liberman, 2010), the psychological distance between people affects individual behavioral decision-making (such as cooperative behavior, altruistic behavior). Previous studies have shown that the further the psychological distance, the less the helping behavior (Jiang, 2013; Stephan, Liberman, & Trope, 2011). As a dynamic system of helping behavior (Eisenberg, 2014), willingness to help was negatively related to psychological distance. During the COVID-19 epidemic, home quarantine which is helpful to curb the spread of the virus inevitably increases the space and psychological distance between people. The increase of both space and social distance will increase the psychological distance (Bar-Anan, Liberman, & Trope, 2006). An important reason for the escalation of interpersonal alienation is the increased distance between people (Yang, Zhang, & Huang, 2002). So, individuals with greater interpersonal alienation may have a high degree of psychological distance from others which may reduce the willingness to help.

4.3. The moderating role of emotion regulation strategies

The results revealed that expressive suppression could be a moderator between interpersonal alienation and the willingness to help proved hypothesis 4, which supports previous research that expressive suppression as an effective emotion regulation strategy can make a positive impact (Geisler & Schröder, 2015; Wei et al., 2013; Zhou & Wang, 2012). Previous studies have shown that in the context of East Asian culture, expressive suppression has an effective impact on negative emotion and is associated with a better social function (Butler et al., 2007; Liu et al., 2016). In China, people advocate to help each other and “unity is strength” in times of crisis. Therefore, in order to meet social expectations, people may try to maintain their willingness to help by suppressing their emotions and expression. Consistent with the “tick not itch” model (Ye, Cheng, Gao, & Xia, 2019), expressive suppression (i.e., risk factor) decreased the adverse effect of interpersonal alienation (i.e., risk factor) on willingness to help. As expected, the relationship between interpersonal alienation and willingness to help was weaker for college students who use more expressive suppression. For college students with a lower expressive suppression, interpersonal alienation has a stronger influence on the tendency to help others. On the contrary, for college students with a high level of expressive suppression, interpersonal alienation has a weaker influence on the tendency to help others. Using more expressive suppression is more likely to inhibit related negative attitudes and behaviors and express more euphemistically. However, when college students use less expressive suppression, the ability and enthusiasm of regulating emotion and inhibiting negative expression may be reduced. It was worth noting that the relation between interpersonal alienation and willingness to help was still significant at a high level of expressive suppression. Surely, the impact of expressive suppression shouldn’t be repudiated entirely, and interpersonal alienation remains a strong antecedent of willingness to help.
However, the result is inconsistent with hypothesis 3 that cognitive reappraisal could not moderate the relationship between risk perception of COVID-19 and interpersonal alienation. Regardless of the level of cognitive reappraisal, the impact of risk perception of COVID-19 on interpersonal alienation is significant. Since the risk perception of COVID-19 has a great influence on interpersonal alienation, cognitive reappraisal cannot effectively buffer the adverse impact of risk perception of COVID-19 on interpersonal alienation. Furthermore, interpersonal alienation may follow the top-down process that the negative emotion arises from the assessment of the situation (Coehran, Smart, & Garcia-Barrera, 2017; Ochser et al., 2009). In the top-down process, if the generation of negative emotions consumes more resources, no more resources may be occupied by cognitive reappraisal which may weaken the effect of cognitive reappraisal (McRae, Misra, Prasad, Pereira, & Gross, 2011). Therefore, owing to the weakening effect of cognitive reappraisal, cognitive reappraisal has no significant buffering effect on the negative impact of risk perception on interpersonal alienation.

4.4. Limitations and future directions

Several limitations should be considered when interpreting the results of the present study. First, the present study was cross-sectional, and the causality cannot be inferred. Further studies should use an experimental or longitudinal design to confirm the causal hypotheses in this study. Second, the measures were based on self-report. Future studies may try to collect data from multiple informants to deepen the current findings. Third, the results of this study should be generalized only to Chinese college students. Further investigation is still needed to test the current hypotheses in cross-cultural studies.

Despite these limitations, the study has theoretical and practical contributions. From a theoretical perspective, this study further extends previous research by confirming the mediating role of interpersonal alienation and the moderating role of expressive suppression. This will contribute to a better understanding of how and when risk perception of COVID-19 influences willingness to help. From a practical perspective, our study may provide information about how to avoid the reduction of college students’ willingness to help in the epidemic period. Firstly, we suggest individuals paying less attention to negative information related to the epidemic, which may increase their risk perception of COVID-19 (Shi et al., 2003). Secondly, individuals should interact more with family and friends that can contribute to reducing interpersonal alienation. Thirdly, expressive suppression is a feasible way to buffer the harmful effect of negative emotions on willingness to help.

5. Conclusion

This study represents a crucial step forward in unpacking how risk perception of COVID-19 may be related to willingness to help among Chinese college students while further replication and extension efforts were advised. Results revealed that interpersonal alienation serves as one potential mechanism by which risk perception of COVID-19 was associated with less willingness to help. Moreover, expressive suppression significantly moderated the influence of interpersonal alienation on willingness to help.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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