# Empathy not quarantined: Association between people's empathy to others and the COVID-19 pandemic situations based on a national survey study

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# Empathy not quarantined: Association between people's empathy to others and the COVID-19 pandemic situations based on a national survey study

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## *Abstract*

**Background:** The Covid-19 pandemic had turned the world upside down, but not much is known about how people's empathy might be affected by the pandemic.

**Objective:** This study examined 1) how empathy towards others might be influenced by the social support people obtained by using social media; and 2) how the individual demographics (e.g., age, income) may affect empathy.

**Methods:** A national survey (N = 943) was conducted in China in February 2020, in which the participants read three real scenarios about low-income urban workers (Scenario I), small business owners in cities (Scenario II), and farmers in rural areas (Scenario III) who underwent hardship due to COVID-19. After exposure to others' difficulties in the scenarios, the participants' empathy and anxiety levels were measured. We also measured the social support they had by using social media.

**Results:** show that social support not only positively impacted empathy, ? = .30, P < .001 for Scenario I, ? = .30, P < .001 for Scenario II, and ? = .29, P < .001 for Scenario III, but also interacted with anxiety in influencing the degree to which participants could maintain empathy towards others, ? = .08, P = .010 for Scenario I, and ? = .07, P = .033 for scenario II. Age negatively predicted empathy for Scenario I, ? = -.08, P = .018 and Scenario III, ? = -.08, P = .009, but not for Scenario II, ? = -.03, P = .40. Income levels – low, medium, high – positively predicted empathy for Scenario III, F (2, 940) = 8.10, P < .001, but not for Scenario I, F (2, 940) = 2.14, P = .12, or Scenario II, F (2, 940) = 2.93, P = .06. Participants living in big cities expressed greater empathy towards others for Scenario III, F (2, 940) = 4.03, P =.018, but not for Scenario I, F (2, 940) = .81, P = .45, or Scenario II, F (2, 940) = 1.46, P =.23.

**Conclusions:** This study contributes to the literature by discovering the critical role empathy plays in people's affective response to others during the pandemic. Anxiety did not decrease empathy. However, those gaining more social support on social media showed more empathy for others. Those who resided in cities with higher income levels were more empathetic during the COVID-19 outbreak. This study reveals that the social support people obtained helped maintain empathy to others, making them resilient in challenging times.

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# Original Manuscript

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**Conclusion**: This study contributes to the literature by discovering the critical role empathy plays in people's affective response to others during the pandemic. Anxiety did not decrease empathy. However, those gaining more social support on social media showed more empathy for others. Those who resided in cities with higher income levels were more empathetic during the COVID-19 outbreak. This study reveals that the social support people obtained helped maintain empathy to others, making them resilient in challenging times.


*Keywords*: empathy, social support, anxiety, COVID-19, social media

## Introduction

The Covid-19 pandemic had turned the world upside down for almost everyone since its first outbreak in China in December 2019. As Covid-19 cases across the globe hit nearly 70 million with 1.54 million deaths [1], considerable research has been devoted to studying the association between the traumatic experiences inflicted by the pandemic and emotional harms such as anxiety, depression and traumatic [2 3]. The prevalence of emotional toll and mental health disorders in the health crisis was identified in general populations who had no psychiatric disorder history nor being infected with coronavirus [4]. But little is known about how people's empathy – "the natural capacity to share, understand and respond with care to the affective states of others" [5, p. vii] – may be shaped by the dire consequences of the pandemic. There is a well-established corresponding relationship between empathy and helping behaviors [6]. High empathy levels, for instance, could positively predict an altruistic response and prosocial behaviors to others who need help, which in turn foster prosocial moral reasoning [7]. While the COVID-19 pandemic has inspired people to help each other, a vexing question that remains unanswered is how the severe pandemic experiences may alter people's empathy towards others who underwent hardship in the health crisis.

Given the pandemic situations, little scholarship has been devoted to examining how people maintain and restore empathy towards each other. To fill the research gap, this study analyzes a national representative sample of 943 Chinese participants and investigates how the tendency for individuals to empathize with others might be influenced by geolocations. Thus, the purpose of this research is twofold: 1) To explores how the social support people obtained on social media might influence empathy for others in the health crisis; and 2) To identify the possible effect of individual demographics such as age, income, and geolocation on empathy for others' hardship, if any. The findings should contribute to understanding how people might collectively preserve resilience as part of their emotional response towards health crises.

## Empathy and Social Support

Empathy refers to “an induction process that reflects an innate ability to perceive and be sensitive to the emotional states of others” [8]. Empathy is shared by both humans and other mammals, which entails two key aspect – “the sharing of emotions and the adoption of another’s viewpoint” [9, p. 87]. Scholars generally agree that empathy can be defined as “an affective response stemming from an understanding or apprehension of another’s emotional state or condition” [10, p. 147]. People with higher empathy can better appreciate the personal distress of another person in need [11]. The current study thus considers empathy as the human ability to perceive and be sensitive to specific emotional stresses and physical suffering others experience in the painful pandemic situations. The ability to empathize can motivate one to show kindness and prosocial behavior towards others [12], while disruption or atypical development of the ability that process others’ distress cues may lead to callous disregard for others [8]. In this vein, we content that sever pandemic situations may distort the ability of extending empathy for others as well as the propensity to help.

The supportive communication literature has long highlighted the role of social support in safeguarding and upholding empathy among people, particularly during stressful and traumatizing times [13]. Social support – “information leading the subject to believe that he is cared for and loved, esteemed and a member of a network of mutual obligations” [14, p. 300] – has been repeatedly identified as a buffer against distress [15] whether at the individual [16] or the societal level [17]. With the proliferation of computer-mediated technology, online social support has received growing scholarly attention [18]. In contrast to face-to-face communication, computer-mediated technologies can bring people of similar stressful experiences together and offer them a strong sense of community [19] and anonymity that is particularly crucial to marginalized populations [20]. Despite the demonstrated benefits of social support, online and offline, in improving individual health [21], more work is needed to understand the relations between the social support obtained by using social media and the tendency of extending empathy for others in a health crisis context.

**Empathy and Anxiety**

Empathy has been identified as a positive predictor of individual life satisfaction [22] and well-being [23]. When receiving empathy from others, individuals may experience gratitude and the sense of inclusion and belonging [24]. As a result, they are more likely to feel positively towards themselves and others as well. For those who are empathetic to others, their well-being may also be enhanced as they realize the positive impact on others due to their kindness (Wei et al., 2011). At the societal level, empathy has been repeatedly highlighted as an essential fabric to a civil, democratic society [25]. In the event of disruptive disasters, those who had high empathy were most likely to help victims of natural disasters [26].

Prior studies have repeatedly discovered a negative correlation between empathy and anxiety in the experience of distress [27]. Anxiety is defined as a future-oriented mood state associated with preparation for possible, upcoming negative events [28]. The enactment of anxiety invokes a sense of insecurity and lack of control among individuals, which could, in turn, decreases individual happiness and well-being [29]. For example, individuals who suffer attachment anxiety find it difficult to be empathetic to others as they struggle to trust and rely on others [27].

In the context of a lethally contagious pandemic, the anxiety levels of individuals may be extremely high due to the pressing threat of death. COVID-19, according to health experts, is on average 20 times more deadly than flu at its peak [30]. When facing this unpreceded, lethal virus with no cure yet, the perceived threat of death was paramount, putting individuals in an extremely high anxious state. Scholars have found that death anxiety is likely to suppress empathy as individuals lose the sense of control and security of themselves [31]. This negative association between anxiety and empathy has also been supported in the medical field. For instance, those with greater death anxiety have significantly lower empathy as opposed to those who are less anxious [32]. As such, we propose:

*RQ1*: Will pandemic-induced anxiety decrease individual empathy towards others during the COVID-19 pandemic.

**Benefits of Social Support**

The scholarship of social support has outlined two major mechanisms through which social support could benefit individuals. One camp of scholarships emphasizes the main effect of social support operationalized as the degree to which one is integrated into a variety of social relationships like friendships, partnerships, and marriages [33]. As social support hinges upon interpersonal relationships, being able to participate in more relationships of sorts increase the available support people have at their disposal [17]. Overall, social support is positive to individuals regardless of the presence of stressful events [34].

Three major mechanisms can explain the main effect of social support. First, greater social integration affords individuals more information as they connect to a wide range of individuals [17]. Informational support has been arguably the most outstanding strengthen of online communities [35] as computer-mediated technology brings people of different locations together. A rich volume of literature has exclusively focused on how individuals seek and receive informational support online [36]. The informational support people gain on social media through accessing and sharing pandemic-related information was found to be one of the coping strategies curbing the pandemic effects on mental health [4]. It functions like a type of social support from family members, friends, colleagues or peers during the pandemic. In healthcare contexts, research has identified that informational support provides patients with significant caring and emotional support, which leads to a series of benefits that help symptom control, disease recovery, life safety, and well-being [37].

Second, besides informational support, individuals often actively seek and obtain emotional support from the information circulated on social media [38]. Emotional support is especially valuable to those who are marginalized or need long-term health care such as patients with HIV/AIDS [39] or Crohn’s disease [37]. These patients often have challenges to obtain understanding and empathy from others with different experiences [40]. Third, social support can also offer people various tangible resources, such as financial aids, shelter, etc. [41], which can prevent individuals from more

risk. Above all, the identity and self-esteem model in the main-effect camp of social support argues that social integration prevents individuals from the despair of social isolation and enhances the sense of belongings and community [42]. Research demonstrates that the sense of belonging positively correlated with empathy [24]. Therefore, we propose:

*RQ2*: Will the social support obtained on social media will increase one's empathy towards others during the COVID-19 pandemic?

The second camp of social support scholarship focuses more on the role of social support in the event of stress. The psychological mechanism through which social support serves as a stress buffer is the appraisal of stress (Brock & Lawrence, 2010). Stress does not necessarily arise along with potential stressors. The key is whether or not individuals indeed appraise the stressors as challenging and stressful (Lazarus, 1966; Lazarus & Launier, 1978). When individuals perceive sufficient social support from others at their disposal, they are less likely to perceive a stressor as frustrating or demanding when they believe the support is within their reach. Moreover, social support one perceives from others will help them better adjust to stressful events without suffering from maladaptation like depression [41] and aggression [43].

As a consequence, they are less likely to enact negative emotions such as anxiety [44]. The buffering effect of social support against anxiety in the event of stressful incidents could explain why researchers found that individuals who lacked social support were at a higher risk of health issues [45]. Under extreme, disastrous crises such as the COVID-19 pandemic, it is reasonable to predict that, based on the existing literature on social support, individuals with more perceived social support online are more likely to maintain empathy towards others and stay away from aggression. Hence, we propose:

*RQ3*: Will social support gained by using social media buffer individuals with anxiety that helps maintain their empathy during the COVID-19 outbreaks.

**The Pandemic Effects on Empathy**

People tend to experience empathy upon exposure to others' misfortune. Empirical evidence has demonstrated that at least in some cases, people's personal distress fail to induce empathy from those who witness it. As a result, they may not receive sufficient, if any, empathy from others. This indicates that individuals' empathy is related to others' misfortune, but could be shaped up by a number of internal or external factors, such as age, income levels, and environmental context such as geolocation. To study how these individual differences under the pandemic situations might affect their empathy, we ask:

*RQ4*: How will age, income level, and geolocation impact individuals' empathy towards others' life difficulty due to the COVID-19?

## Methods

### *Research Procedure*

A marketing research company helped recruit a national representative sample for this research by using the quota sampling method. Over 4,000 questionnaires were distributed and 943 participants completed the online survey and experiment in February 2020, who came from 30 provinces across China. Each participants received a nominal compensation of ¥10, or US $1.34. The current quota sample was collected to mirror the national Chinese population [46], except gender. An invitation link to the study was sent out to potential participants based on a national database of consumers maintained by the company. Upon clicking the link, participants were directed to the online questionnaire, in which they read the stimuli - three scenarios about the difficulties people experienced due to COVID-19, which were all real cases. To control the quality of the experiment, we recorded the time each participant took to finish the experiment and removed those who completed the study under 10 minutes or over one hour.

### *The Stimuli*

Three scenarios that actually happened in China were adopted to be the stimuli after removing the victims' names and geolocations to minimize possible proximity effects, which exert one of the most

reliable influences on information processing [47]. The three scenarios were edited to make them consistent in terms of tones, length, and details. The length of Scenarios I and III is the same – 74 words, and Scenario II has 71 words. Each of them contains a similar number of details without subjective comment or emotional words. Participants reported their empathy after reading each of the scenarios.

*Scenario I* described urban workers' losses during the epidemic, measuring the participants' empathy towards low-income urban groups. The exact wordings of Scenario I is, "Due to the COVID-19 outbreak, many low-income workers – migrant workers, street vendors, food stalls, porters, and other temporary workers – are either laid off or underpaid. As business took a heavy hit by the coronavirus crisis, they have much less work or no work, making it challenging to support their families. One day out of work means one day without income. This becomes more difficult for those low-income families with sick elderly and/or small children."

*Scenario II* was about small business owners, who belonged to mid-income urban groups. It reads, "The widespread bankruptcy outlook of small business owners in cities comes close due to massive economic loss. While these businesses have been shut down with severely reduced or no revenues, they still have to pay for costs and expenses such as rentals and employee benefits. If the coronavirus outbreak cannot be brought under control soon, corporate bankruptcy is unavoidable, bringing a domoic effect of serious hardships to many people's everyday lives."

*Scenario III* tested the empathy towards farmers, whose income level was the lowest compared to those in Scenario I or II. It reads, "Due to the travel bans as a result of the COVID-19 outbreak, many farm chickens and ducks are on the verge of being starved to death. The traffic restrictions have blocked farmers' ways to purchase food to feed these farm animals nor to sell them. As a large number of chickens and ducks are waiting to die of starvation. Numerous farmers will suffer great financial losses and lose everything they have."

***Independent Variables***

*Anxiety.* Seven items from the Depression Anxiety Stress Scale[48] were used to measure anxiety in the participants. They rated the items on 4-point scale (0 = "Did not apply to me at all" and 3 = "Applied to me very much, or most of the time"), including "I experienced trembling (e.g., in the hands)" and "I felt I was close to panic" (Cronbach's $\alpha$ = .89, $M$ = .60, $SD$ = .69).

*Social support*. Six items adapted from Barrera et al. (2002) and Oh and Lee (2012) were used to measure perceived social support participants received in using social media (i.e., WeChat) during the COVID-19 outbreak. Participants were asked to rate their agreement on a 5-point scale from 1 = "Strongly disagree" to 5 = "Strongly agree" on sample items such as "WeChat friends give me additional information about the coronavirus epidemic that I am not familiar with" (Cronbach's $\alpha$ = .89, $M$ = 3.43, $SD$ = .75).

*Demographics*. Some demographics were treated as independent variables such as age, and perceived income level (i.e., low, medium, and high). Finally, geolocation was measured by asking participants' residence in "big cities", "small cities or towns", or "rural areas."

***Dependent Variable***

*Empathy.* Empathy was measured with three items adapted from two studies [49 50]. After reading each scenario, participants were asked to rate their agreement on 5-point scale (0 = "Strongly disagree" and 5 = "Strongly agree") with items like "I get very worried and upset when I see someone who needs help in an emergency" (Cronbach's $\alpha$ = .80, $M$ = 3.63, $SD$ = .73).

**Results**

The national sample ($N$ = 943) had an average age of 35.76 ($SD$ = 9.97). Over one third of them ($n$ = 350, or 37.11%) reported having low income, 531, or 56.31%, middle income, and 62, or 6.57%, high income. Most of them ($n$ = 642, or 68.08%) resided in big cities such as Beijing, Shanghai or Wuhan, 196, or 20.78%, lived in small cities or towns, and 105, or 11.13%, in rural areas. Gender was the only demographic in the sample that was inconsistent with the national population as it had 545 females, or 57.79%, and 398 males, or 42.21%. Most of the participants ($n$ = 735, or 67.34%)

reported frequent or very frequent WeChat use for epidemic-related information, 184, or 19.51%, of the participants sometimes used it for the same purpose, but 124, or 13.14%, almost never or rarely used WeChat for accessing epidemic information.

***Social Support and Empathy***

*Scenario I*. A hierarchical regression was conducted to examine the impact of social support participants perceived on WeChat and anxiety on empathy amidst the national outbreak of coronavirus. Zero-order terms of these variables were first entered in step 1, followed by the interaction term between anxiety and social support perceived on WeChat in step 2. All variables were standardized prior to entering the hierarchical regression.

Together, anxiety and perceived social support on WeChat predicted a significant portion of variance in empathy, $F$ (3, 939) = 33.46, $P$ < .001, adjusted $R^2$ = .09. Table 2 reports all statistics associated with the hierarchical regression analysis. RQ1 asked about the impact of anxiety on empathy. The analysis failed to obtain a significant main effect of anxiety on empathy, $\beta$ = .03, $P$ = .33. However, RQ2 was supported: social support obtained by using social media was found to enhances empathy, $\beta$ = .30, $P$ < .001. However, the main effect for anxiety and social support through using social media should be interpreted in light of a significant Anxiety X Social Support interaction that was obtained, $\beta$ = .08, $P$ = .010. Therefore, social support interacted with anxiety in influencing participants' empathy towards others.

To probe the interaction of anxiety and perceived social support in affecting empathy, a simple slope analysis was conducted at +/-1 SD of the mean of social support using Process Macros with the Johnson-Neyman technique [51]. Such an analysis revealed that when obtaining more social support by using social media, participants' empathy did not vary significantly as anxiety increased, $b$ = -.06, $SE$ = .05, LLCI = -.15, ULCI = .03, $P$ = .20. However, when perceiving higher levels of social support on social media, participants' empathy significantly increased as their anxiety levels intensified, $b$ = .09, $SE$ = .04, LLCI = .02, ULCI = .17, $P$ = .019 (Figure 1).

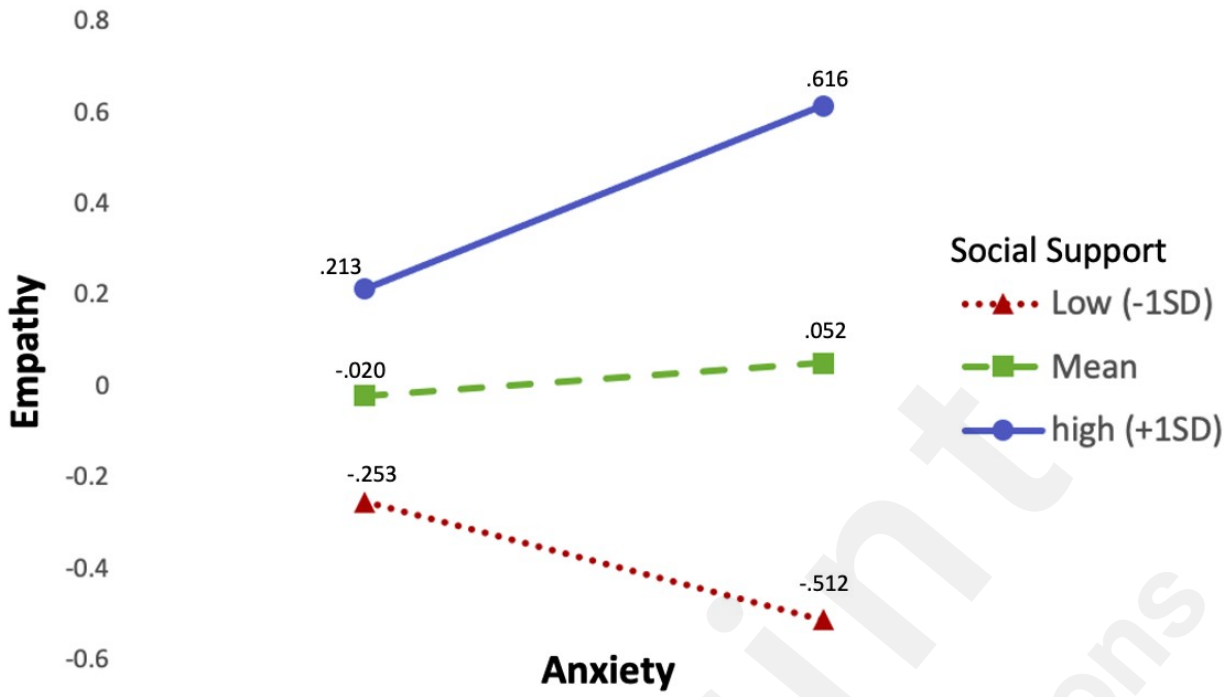


**Figure 1.** Interaction of anxiety and social support on empathy: Empathy towards low-income group - farmers (Scenario I).

*Scenario II*. Similar to Scenario I, another hierarchical regression was conducted to examine the impact of perceived social support and anxiety on empathy during the health crisis. Zero-order terms of these variables were first entered in step 1, followed by the interaction term between anxiety and social support in step 2. All variables were standardized prior to entering the hierarchical regression. Overall, the total model accounts for a significant portion of variance of empathy, $F$ (3, 939) = 32.77, $P$ < .001, adjusted $R^2$ = .09. As shown in Table 1, similar to the findings of Scenario I, this analysis revealed a non-significant main effect of anxiety on empathy, $\beta$ = .02, $P$ = .61. Yet the social support, consistent with Scenario I, significantly enhanced participants' empathy during the outbreak, $\beta$ = .30, $P$ < .001. As such, like Scenario I, RQ2 received support but RQ1 failed to receive support. However, the main effect for anxiety and social support should be also interpreted in light of a significant Anxiety X Social Support interaction that was also obtained, $\beta$ = .07, $P$ = .033. Using the same Process Macros procedures, another simple slope analysis was conducted at +/-1 SD of the mean of social support to probe the impact of anxiety and perceived social support on empathy. This

analysis indicated a similar pattern as suggested in Scenario I. When perceiving low levels of social support, participants' empathy seemed to decrease as they got more anxious (though not statistically significant), *b* = -.06, SE = .05, LLCI = -.15, ULCI = .03, *P* = .21. When perceiving higher levels of social support on social media, participants' empathy grew along with their anxiety levels, though only to a marginally significant degree, *b* = .07, SE = .04, LLCI = -.01, ULCI = .15, *P* = .086 (Figure 2).

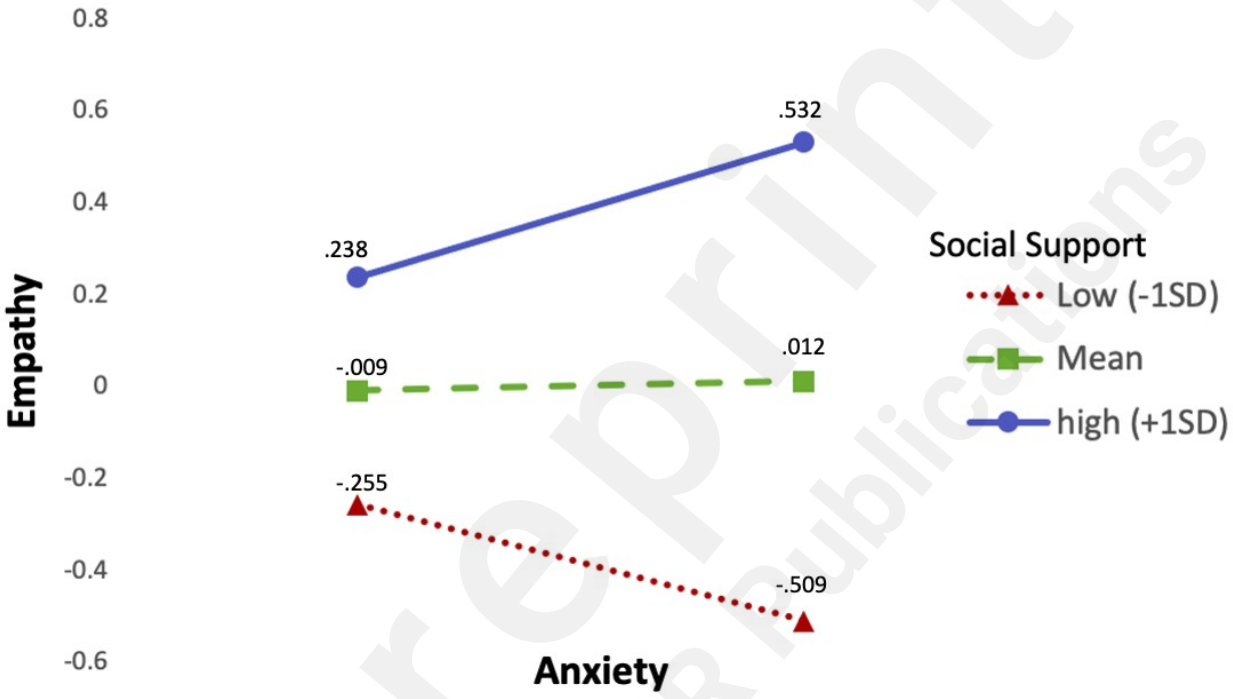


**Figure 2.** Interaction of anxiety and social support on empathy: Empathy towards mid-income groups – small business owners (Scenario II).

*Scenario III.* Similar to Scenario I and II, hierarchical regression analysis was performed to examine the impact of perceived social support and anxiety on empathy. Zero-order terms of these variables were first entered in step 1, followed by the interaction term between anxiety and social support in step 2. All variables were standardized prior to entering the hierarchical regression.

Overall, the total model accounts for a significant portion of variance of empathy, *F* (3, 939) = 29.05, *P* < .001, adjusted $R^2$ = .08. Table 1 also reports all statistics associated with the hierarchical regression analysis. Similar to the findings of Scenario I, this analysis also revealed a non-significant

main effect of anxiety on empathy, $\beta$ = .01, $P$ = .86. Yet social support perceived on WeChat, consistent with Scenario I, significantly increased participants' empathy to farmers during the coronavirus outbreak, $\beta$ = .29, $P$ < .001. However, unlike scenario I and II, this analysis failed to obtain a significant Anxiety X WeChat social support interaction on empathy toward farmers in scenario III.

**Table 1. Social support and anxiety as a predictor for empathy**

| | ***β*** | ***Adjusted $R^2$*** | ***$R^2$ change*** | ***F*** |
|---|---|---|---|---|
| *Scenario I* | | | | |
| Step 1 | | .09 | – | 46.60*** |
| Anxiety | .01 | | | |
| Social support | .30*** | | | |
| Step 2 | | .00 | .01* | 33.46*** |
| Anxiety x Social support | .08* | | | |
| *Scenario II* | | | | |
| Step 1 | | .09 | – | 46.69*** |
| Anxiety | .02 | | | |
| Social support | .30*** | | | |
| Step 2 | | .09 | .01 | 32.77*** |
| Anxiety x Social support | .07* | | | |
| *Scenario III* | | | | |
| Step 1 | | .08 | – | 43.62*** |
| Anxiety | .01 | | | |
| Social support | .29*** | | | |
| Step 2 | | .08 | .01 | 29.05*** |
| Anxiety x Social support | .00 | | | |

*Note*: * $P$ < .05; *** $P$ < .001.

***Demographics and Pandemic Situations on Empathy***

RQ4 asks how some demographics might impact individuals' empathy towards those facing life challenges during the COVID-19 outbreaks. Three linear regressions were conducted for the three scenarios and suggested that age negatively predicted empathy for scenario I, $\beta$ = -.08, $P$ = .018 and scenario III, $\beta$ = -.08, $P$ = .009, but it failed to predict empathy for scenario II, $\beta$ = -.03, $P$ = .40. The older the participants, the less empathetic they were towards those low-income families and farmers who were going to take a great hit from the pandemic in scenario I and III, respectively. However, their empathy did not vary by age for those small business owners in scenario II. ANOVA analyses

identified participants' family income as a significant predictor of empathy for Scenario III, $F(2, 940) = 8.10$, $P < .001$, but not for Scenario I, $F(2, 940) = 2.14$, $P = .12$, or Scenario II, $F(2, 940) = 2.93$, $P = .06$. As shown in Table 1, participants with low income showed empathy ($M = 3.48$, $SD = .72$) toward farmers in scenario III significantly lower than those with medium ($M = 3.66$, $SD = .70$) or high income ($M = 3.73$, $SD = .79$).

Three One-Way Analysis of Variance (ANOVA) were then performed to examine whether participants' geolocation affected their empathy in the three scenarios. Geolocation emerged as a significant predictor of empathy for Scenario III, $F(2, 940) = 4.03$, $P = .018$, but not for Scenario I, $F(2, 940) = .81$, $P = .45$, or Scenario II, $F(2, 940) = 1.46$, $P = .23$. As Table 1 shows, participants living in rural areas showed significantly lower empathy ($M = 3.42$, $SD = .75$) toward farmers in Scenario III than those from small cities or towns ($M = 3.57$, $SD = .68$) or large cities ($M = 3.63$, $SD = .72$).

**Table 2. The Effects of pandemic situations on empathy**

| | ***Low Income*** | ***Medium Income*** | ***High Income*** |
|---|---|---|---|
| *Empathy* | | | |
| Scenario I | | | |
| *Mean* | 3.57 | 3.65 | 3.75 |
| *SD* | .73 | .73 | .75 |
| Scenario II | | | |
| *Mean* | 3.38 | 3.46 | 3.59 |
| *SD* | .70 | .75 | .82 |
| Scenario III | | | |
| *Mean* | 3.48[a] | 3.66[b] | 3.73[b] |
| *SD* | .72 | .70 | .79 |
| | *Big Cities* | *Small Cities or Towns* | *Rural Areas* |
| Scenario I | | | |
| *Mean* | 3.65 | 3.59 | 3.57 |
| *SD* | .75 | .71 | .69 |
| Scenario II | | | |
| *Mean* | 3.47 | 3.40 | 3.35 |
| *SD* | .76 | .71 | .67 |
| Scenario III | | | |
| *Mean* | 3.63[b] | 3.57[b] | 3.42[a] |
| *SD* | .72 | .68 | .75 |

*Note*: Means that do not share the same superscripts differ at $P < .05$.

## Discussion

It is important to study empathy in a pandemic environment as it is associated with human satisfaction of interpersonal relations, moral behaviors and even mental health conditions [52]. This study may be one of the first that investigated how people's empathy may be altered by the detrimental consequences of the COVID-19 pandemic. It first let the participants read three scenarios about people's hardship caused by the pandemic, who had different social statuses (i.e., farmers living in the rural areas, low-income workers and small business owners in cities). Then it measured the participants' anxiety levels and how their empathy for others in need might be affected by the perceived social support they obtained by processing social media information and pandemic situations they lived in. The participants took part in this research in February 2020, the peak time of the COVID-19 epidemic in China. But the health crisis had not yet spiraled into a pandemic around the rest of the world, which made those who first experienced the unprecedented disease extremely worried, stressful, lonely, and even traumatized [53]. The results discover that anxiety played a role in shaping up empathy, which was also influenced by some demographic variables, such as age, income, and geolocation. Generally, the findings show that those who were younger tended to be more sympathetic to low-income families and farmers than older participants. People living in small cities or towns and those with high income displayed more empathy towards farmers who were at the blink of losing so much in this pandemic than those who in the rural areas and earned low or medium income.

It is important to note that the social support people gained by using social media on had prevented them from aggression and helped them stay empathetic to others. Across the three scenarios, we found a significant main effect of social support individuals gained through social media on enhancing their empathy towards others. This is consistent with previous literature that identifies an overall positive main effect of social support on individuals, such that even in the absence of distress, having available social support at one's disposal can be beneficial to individuals [34]. This could be

due to the psychological mechanisms of sense of belonging and community [54] that are correlated positively with individual empathy [24].

No significant main effect of anxiety on empathy was detected in two of three scenarios. While the main effect of anxiety was not obtained, anxiety did interact with the social support in impacting empathy. This suggests that anxiety alone might not necessarily decrease individual empathy as suggested previously [31]. Instead, there might be a contingent effect of empathy, such that depending on the other factors like the social support one perceived online could amply or alleviate the negative influence of anxiety on empathy.

The contingent impact of anxiety is further supported by the interactions of anxiety and social support obtained across the three scenarios in this current study. It is worth noting that empathy did not vary significantly when individuals perceived social support online was low or high. This suggests that although the low perceived social support does not aggregate the negativity of anxiety, it will not help buffer individuals from anxiety and increase their empathy either. However, the benefits of social support manifest when individuals perceive sufficient social support, their empathy increases as their anxiety levels grow. This result suggests that empathy does not necessarily grow with anxiety linearly if individuals feel that they are well supported and cared for by others online.

The results of our study provide evidence to both the main effect [34] and buffering function [55] of social support to individuals. This suggests that social support overall is not only beneficial to individuals on a regular basis, but it is also protective when it comes to extremely stressful events like the COVID-19 pandemic. As such, more research should be devoted to further examining the underlying mechanisms through which social support could benefit individuals with or without stressors besides the ones that have been revealed in previous research [54].

This research contributes to the existing social support literature by empirically testing the two major models – main effect and buffering effect – of social support. As revealed by the findings, both the main effect and buffering effect receive support. This suggests a multifaceted nature of social

support, which could benefit people through enhancing a variety of psychological mechanisms, including social integration, the sense of belonging, and the sense of community. Hence, even without any outstanding stressors, individuals are better off when they perceive sufficient support from others and are likely to be more empathetic to others.

This research thus extends the current scholarships on social support by examining the theory in an extremely stressful circumstance – a global pandemic. While previous literature has demonstrated the desirability of social support in eliciting pro-social behaviors [26], few studies had empirically tested this in an stressful environment as we did in the current study. Results of this research further confirm the positivity of social support, such that under a high-risky public health crisis that endangered the health of global populations and caused millions of lives, social support was found to play a significant role in reserving resilience against disasters. The results also pave a promising path for scholars who are interested in social support in the computer-mediated context, such that when individuals are not able to obtain face-to-face support from each other, having access to online support also protects them from anxiety and stay empathetic to others.

Some practical implications also stem from this research for individuals, healthcare professionals, aid agencies, and policymakers. For individuals, it is important to keep in mind the benefits of seeking social support online when experiencing stress. As such, individuals need not to suffer alone. Instead, they should actively seek support from others, which has been facilitated by the proliferation of the Internet. For example, individuals could turn to online support groups or social media groups, where they could find people of similar experiences for informational, emotional, and/or tangible support. Even if there are no stressors experienced, individuals can still benefit from social support by actively investing in various social relations. On the other hand, because of the benefits of social support regardless of the existence of stress, it is crucial for people to stay empathetic and supportive to each other because it will not only affect people who are stressed but people in general on a daily basis.

To healthcare professionals and aid agencies, it is valuable to utilize the power of social support online to aid individuals through difficult times. As our results suggest, online social support can protect individuals from anxiety and stay empathetic to others especially when they perceive the support is high. Therefore, healthcare professionals, aid agencies and social support workers should strategically take advantage of various computer-mediated technologies such as online forums and social media groups to reach out to individuals and offer them support and care especially when they suffer from outstanding stress.

For policymakers, it is particularly important to keep the online environment free from hate speech, hatred, and aggressive expressions as they run counter social support and will tear apart individuals when they need to be cared for and supported. As our society has become increasingly polarized and uncivil online, it is imperative to address this problem so that computer-mediated technologies could work in favor of individuals and sustain empathy that is essential to a kind and democratic society.

**Limitations and Future Directions**

This study, of course, has limitations, on which future research can be built. On one hand, this study was conducted in China with a relatively collectivistic culture as opposed to the Western culture has emphasized more on individualism [56]. Indeed, it will be very interesting to see how people from a more individualistic culture evaluate the role of social support during massive public crises like the COVID-19 pandemic. Future research could conduct comparative studies that compare and contrast the role of social support during stressful disasters. On the other hand, while this research has demonstrated the beneficial main effect and the buffering effect of social support to individuals, we did not explore the underlying psychological mechanisms that explain the main effect and the buffering effect of social support to individuals with or without outstanding stress. Future research should expand this current research and further dig into the psychological explanations of the multifaceted nature of social support. As we move forward to embrace the burgeoning computer-mediated technology, understanding how social support could glue us together and help us maintain

empathy towards each other will be one of the keys to uniting our society and building more kindness among us.

## Conclusion

This study examines how people's empathy might be influenced during the COVID-19 pandemic. The social support people obtained on social media helped them maintain and extend empathy for others in need. This implies that social media use may play an important role in preserving empathy, which eventually makes them more resilient in the challenging times. Empathy was also found to interact with anxiety in influencing the degree to which participants could maintain empathy. While anxiety does not necessarily decreased empathy, those who reported gaining more social support on social media showed more empathy towards others despite their increasing levels of anxiety. This study thus contributes to the literature by revealing the critical role of empathy in people's affective response to others' challenges during the pandemic.

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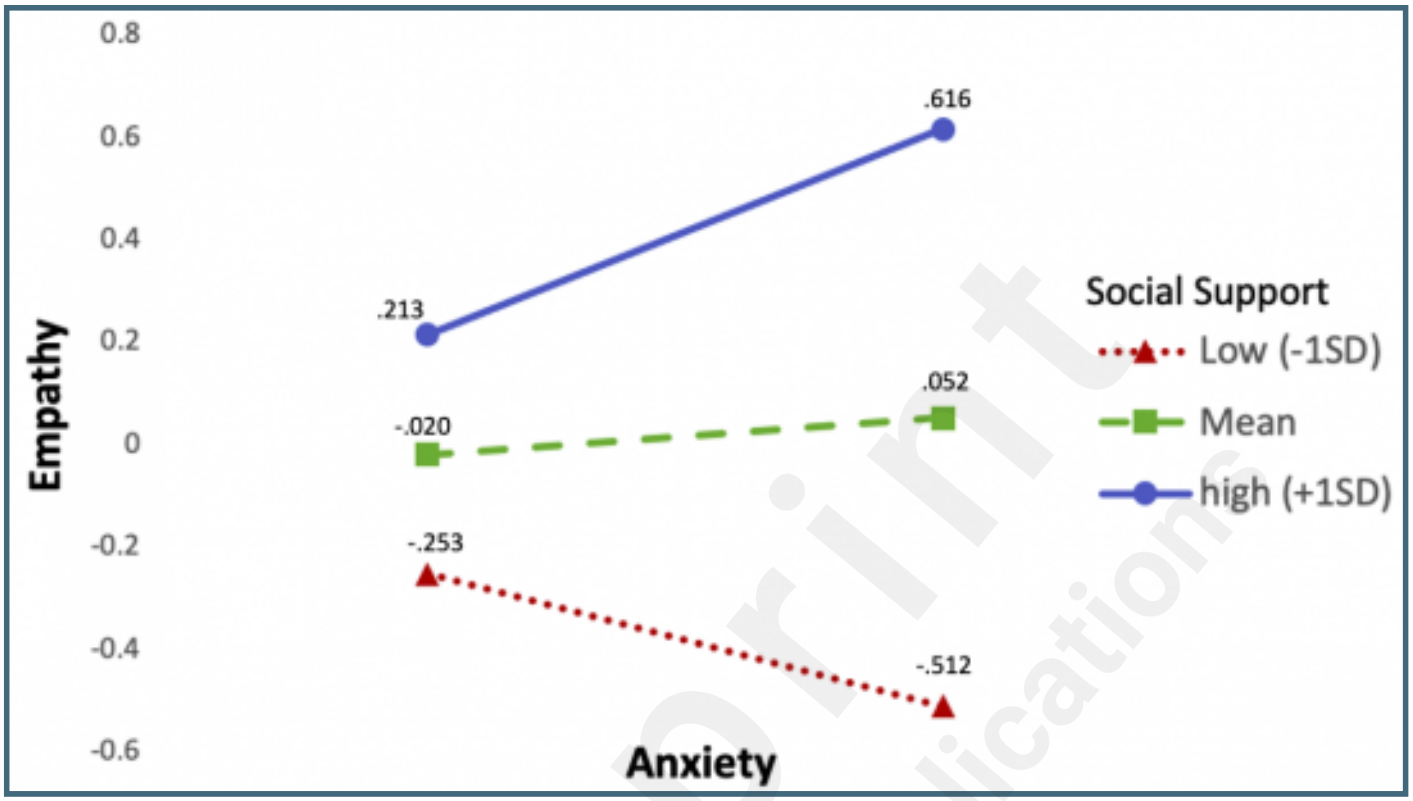
# Supplementary Files

# Figures

Interaction of anxiety and social support on empathy: Empathy towards low-income groups - farmers (Scenario I).



Interaction of anxiety and social support on empathy: Empathy towards mid-income groups – small business owners (Scenario II).