The relationship between fear of COVID-19 and online aggressive behavior: A moderated mediation model

Short Title: Fear of COVID-19 & Online Aggressive Behavior

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Abstract

In the midst of COVID-19, fear has run rampant across the globe. In an effort to curb the spread of the virus, the social ecology as we had known it had drastically transitioned to a virtual setting. However, such a transition, while warranted and well-intended, may come with unforeseen consequences. Namely, one's fear of COVID-19 may more readily manifest in subsequent behaviors in an otherwise incognito virtual social ecology. In the current research, a moderated mediation model examined the mechanisms underlying the relation between fear of COVID-19 and aggressive online behavior among Chinese college students. Utilizing a large sample of Chinese college students ($N = 2,799$), results indicated that fear of COVID-19 was directly positively related to engagement in online aggressive behavior. Moral disengagement partially mediated the link between fear of COVID-19 and college students' online aggressive behavior. The degree of family cohesion reported by participants served to buffer against the relation between moral disengagement and online aggressive behavior. The findings, theoretical contributions, and practical implications of the present paper are also discussed.

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Keywords: Fear of COVID-19, Moral disengagement, Family cohesion, Online aggressive behavior, Chinese college students

1. Introduction

Since its first outbreak, COVID-19 has ravaged the globe. While similar to its sister strains of coronaviruses (e.g., SARS), COVID-19 has proven to be much more infectious and difficult to contain at a global scale (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). COVID-19 was discovered in Wuhan, China in late 2019 and quickly spread to the rest of mainland China and its neighboring countries in early 2020. With the increasing number of confirmed cases, primary public health emergency responses were activated across many provinces in China. In order to avoid further spread of the virus, citizens were advised to stay at home as much as possible and avoid non-essential contact with others.

With state-mandated orders for sheltering in place, much of social interactions and dissemination of news and information have transitioned to online networks. Indeed, as the internet has become more ubiquitous for Chinese citizens over the past decade, reaching almost a billion internet users in the country (China Internet Network Information Center, 2020), online networks have been a popular gateway to remain in touch with the outside world. Compared to the end of last year, China's Internet traffic has increased by approximately 50% (Liu, 2020). However, while the internet brings convenience to our lives, it is inevitably accompanied by rampant deviant behavior (e.g., online aggressive behavior) in the virtual world. For instance, recent evidence suggests that approximately 59.47% of Chinese college students have participated in online aggressive behavior at one time or another (Jin, 2018).

An unfortunate consequence to the ubiquity of internet access, online aggressive behavior can occur across various platforms, such as via social media, gaming, and mobile phone interactions (Wright, 2020). Online aggressive behavior is not only harmful to the mental health

of its victims, such as inducing anxiety, depression, and even suicidal tendencies (Guo, 2016; Pabian & Vandebosch, 2016), but also may result in some physiological symptoms as well, such as sleeping disorders and headaches (Tozun & Babaoglu, 2018; Vaillancourt, Faris, & Mishna, 2017). Thus, while internet access has certainly made the transition to an isolated world amidst the COVID-19 pandemic smoother, it has heightened our need to monitor the negative consequences of increased online aggressive behavior, particularly among the more tech-savvy youth.

As described above, it is of theoretical and practical importance to explore factors that may contribute to an increase or decrease in youth online aggressive behavior during these troubled times. Confronted by COVID-19's veil of novelty and uncertainty shrouding the outcomes of the future, fear has been a natural response by many affected individuals (Wang et al., 2020), inducing a persistent state of negative emotion (Watson, Clark, & Tellegen, 1988). While negative emotion has been documented to be related to engagement in aggressive behavior (e.g., Song, 2019), no study, to the best of our knowledge, has examined the relation between fear of COVID-19 and engagement in online aggressive behavior among Chinese college students. Therefore, the aims of the present study were to examine and test whether fear of COVID-19 was significantly related to online aggressive behavior among Chinese college students and the underlying mediating and moderating mechanisms in this association.

1.1 Fear of COVID-19 and online aggressive behavior

Fear has universally been documented and regarded as a key basic negative emotion, elusive in its influence of human behavior (e.g., Watson et al., 1988). Amidst the COVID-19 pandemic, fear has been a pervasive and persistent state of emotion for the people affected (Wang et al., 2020). During widespread events of public health emergencies, symptoms of

negative mood disorders (e.g., fear, anxiety, depression) are common (Dai, 2014). Given the novelty and uncertainty of COVID-19, and the global scale of the virus, there is little doubt that the current pandemic will also induce a similar atmosphere of fear and angst amongst the populace as it has in the past for less infectious viruses. This atmosphere of fear, in turn, presents a troublesome preamble to the reality of the consequences befalling on the citizens' mental and physical health through pervasive state of heightened stress (Wang, Yang, Li, Lei, & Yang, 2020). However, given the magnitude of COVID-19 to date, it is unclear how individuals cope with the sudden influx of negative cognition and emotion. People naturally gravitate, whether willingly or otherwise, to seek methods in which one may cope with emotional problems (e.g., unhappiness and fear) and mitigate the negative effects stemming from such problems (Larsen, 2000; Zillmann, 1974). In other words, it is posited that efforts to reduce one's negative state of emotion is a natural response.

In early adulthood, college students may often lack the necessary life experiences and skills to adaptively cope and manage novel, emergent problems. This may be a particularly decisive issue given that college students may be ill-equipped to confront the sudden and unusual circumstances surrounding the COVID-19 pandemic. In this persistent negative emotional state, aggressive behavior may run rampant among college students (Bitler, Linnoila, & George, 1994; Song, 2019; Sprott & Doob, 2000). Indeed, while aggressive behavior often hurts the victim and causes negative social influence (Sun, Ban, Yang, & Ban, 2016), it has previously been suggested that aggressive behavior may manifest as a maladaptive coping mechanism for aggressors to relieve negative emotions and feel better about their own stressful situation (Bushman, Baumeister, & Phillips, 2001; Robertson, Daffern, & Bucks, 2012). Further, when one loses agentic control over their environment, individuals may opt to adopt maladaptive deviant coping

strategies (e.g., attacking) as a compensatory control method to relieve and soothe their negative emotional state (Shoss, Jundt, Kobler, & Reynolds, 2015). Because the COVID-19 pandemic leaves little room for individual agentic control, induces fear amongst the populace, and has also forced many residents to shelter at home with only the internet as the gateway towards social contact, the current pandemic may have concocted the necessary reagents to stir a rather contentious virtual social ecology for human interactions.

The examination of the relation between negative affective state and aggression amidst the pandemic, however, remains unclear. That is, the negative emotions stemming from COVID-19 may be qualitatively different from those generated by routine daily events under otherwise normal circumstances. Whether COVID-19-specific negative emotions will induce and yield similar aggressive tendencies among college students is largely unknown and worth investigating. During the COVID-19 outbreak, the Chinese government mandated residents to shelter at home to mitigate the spread of the virus. This inadvertently increased internet traffic as residents spent more time online in the absence of in-person interactions. The anonymity of the internet can serve as a shield to protect aggressors from immediate bad consequences (Moore, Nakano, Enomoto, & Suda, 2012), further waning the psychological restraint one may self-impose for normative social interactions. This may inadvertently make it easier for students to engage in online aggressive behavior to soothe their fear of COVID-19 and release stress without the normal guilt and restraint that accompanies such behavior. Although not yet empirically tested, there is reasonable conceptual rationale to expect that there may be a positive correlation between fear of COVID-19 and online aggressive behavior.

1.2 Moral disengagement as a mediator

The relation between fear of COVID-19 and online aggressive behavior is unlikely to be a simple, direct one. The general aggression model (GAM) (Anderson & Bushman, 2002; Fang et al., 2020; Watts, Wagner, Velasquez, & Behrens, 2017) posits that personal and situational factors will influence internal states. In other words, other factors influenced by one's emotional state will in turn also affect online aggressive behavior. In this study, the primary factor of interest is *fear of COVID-19* and is operationalized as a personal factor which will likely be correlated with online aggressive behavior. Drawing from GAM, moral disengagement may act as a mediator between fear of COVID-19 and online aggressive behavior wherein moral disengagement, the self-regulatory strategy through which individuals justify their immoral actions to appear less harmful, may minimize one's perceived role in the outcome of their immoral actions, or at least reduce the apparent distress stemming from what they cause to others (Bandura, Barbaranelli, Caprara, & Pastorelli, 1996; Bjarehed, Thornberg, Wanstrom, & Gini, 2020). Although not yet tested, it is reasonable to expect that moral disengagement acts as a mediator between fear of COVID-19 and online aggressive behavior.

Prior studies have long documented that negative emotions (e.g., anger) are related to greater engagement in moral disengagement (Jin, Lu, Zhang, Jin, & Zhao, 2017), possibly as a self-protective measure against any consequences stemming from negative emotion-driven actions. Further, moral disengagement can be regarded as a stateful cognitive orientation, which is not immutable (Moore, 2008). Amidst a novel and threatening pandemic, a constant state of fear and anxiety may induce a heightened sense of moral disengagement (Anderson & Bushman, 2002) as a self-protective factor. Secondly, as prior studies have documented, individuals with higher levels of moral disengagement are more likely to aggress against others (Bussey et al., 2015; Mazzone, Yanagida, Caravita, & Strohmeier, 2019; Zheng et al., 2017). Due to reduction

of self-punishment and guilt, it may be easier for individuals to vent their emotions and stress on innocent people through negative online interactions. Therefore, moral disengagement may mediate the relation between fear of COVID-19 and online aggressive behavior.

1.3 Family cohesion as a moderator

Although fear of COVID-19 may increase the hazard of online aggressive behavior through the mediating role of moral disengagement, not all individuals with higher level of moral disengagement will homogeneously show perpetration of online aggressive behavior. Thus, it is necessary to explore potential moderating variables that may influence the relation between moral disengagement and online aggressive behavior. Due to government mandated home quarantines, college students in China suddenly found themselves situated at home with their families during the pandemic. The family dynamic continues to play an important role for individuals' healthy psychological development (Liu, Zhang, Zhu, Li, & Chen, 2020; Zhan & Li, 2019). Indeed, family cohesion comprises the emotional bonding between family members and the degree of autonomy experienced by individuals within the family system (Olson, Sprenkle, & Russell, 1979; Olson, Portner, & Bell, 1982) and serve as important facets of proper socialization. For instance, individuals who report experiencing higher levels of family cohesion and adaptability have reported engaging in fewer problematic (Jiang, Liu, Jiang, Hong, & Jin, 2018) and aggressive behavior (Lu, Shao, Guo, & Wang, 2019).

From the perspective of the organism-environment interaction model (e.g., Lerner, Lerner, Almerigi, & Theokas, 2006), behavioral tendencies are formed and developed in the process of the interaction between individual and environmental factors. In our study, the interaction between moral disengagement and family cohesion may develop online aggressive behavior. Based on the risk buffering model (Bao et al., 2014), protective factors may buffer

(i.e., reduce the negative impact of) against the consequences brought about by risk factors. In this study, we examine moral disengagement as a risk factor in individuals' tendency to aggress others and family cohesion as a protective factor that may buffer the effect of moral disengagement on the likelihood of engaging in online aggressive behavior. In other words, the effect of moral disengagement should be the highest for college students who report lower family cohesion within their households. To date, no research has examined family cohesion as a moderator of the indirect relationships between moral disengagement and online aggressive behavior.

1.4 The present study

Figure 1. The Proposed Moderated Mediation Model

To sum, there were three purposes in the current research. First, the current research tested the relation between fear of COVID-19 and online aggressive behavior. Second, we examined whether moral disengagement would mediate the relation between fear of COVID-19 and perpetration of online aggressive behavior. Third, we tested whether the relation between moral disengagement and online aggressive behavior is moderated by family cohesion (Figure 1). Based on the literature review, we proposed the following hypotheses:

Hypothesis 1. Fear of COVID-19 is related to online aggressive behavior.

Hypothesis 2. Moral disengagement will mediate the relation between fear of COVID-19 and online aggressive behavior.

Hypothesis 3. Family cohesion will moderate the relation between moral disengagement and online aggressive behavior.

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 2,799 students (70% female) anonymously completed the survey on measures including demographic variables, fear of COVID-19, moral disengagement, family cohesion, and online aggressive behavior. Among the total sample, 1,402 (50.09%) were first years, 1,176 (42.02%) were second years, 128 (4.57%) were third years, and 93 (3.32%) were first years. The mean age of the participants was 19.63 ($SD = 1.23$, range = 18 - 25).

2.2 Measures

2.2.1 Fear of COVID-19

Fear of COVID-19 was measured via a self-report scale. Participants rated 9 items (e.g., "I worry about being infected by others") on a five-point scale (1 = *never*, 5 = *always*). Higher scores indicate higher level of fear. In our study, Cronbach's α for the fear of COVID-19 was 0.91. Furthermore, confirmatory factor analysis (CFA) suggested that the one-factor model fit the data well: TLI = 0.98, CFI = 0.99, RMSEA = 0.06, SRMR = 0.02.

2.2.2 Moral Disengagement

Moral disengagement was measured by Moral Disengagement Scale (MDS) (Detert, Trevino, & Sweitzer, 2008; Chinese version revised by Wang & Yang, 2010). Participants rated

26 items (e.g., “It is okay to tell small lies because they don't really do any harm”) on a five-point scale (1 = *strongly disagree*, 5 = *strongly agree*) assessing eight dimensions of moral disengagement including 1) moral defense (4 items), 2) euphemism (3 items), 3) favorable comparison (3 items), 4) responsibility transfer (3 items), 5) responsibility decentralization (4 items), 6) distortion of results (3 items), 7) dehumanization (3 items), and lastly 8) blame attribution (3 items). Higher scores indicated greater moral disengagement. The Chinese version of the scale has previously been among Chinese college students with good reliability and validity (Liu & Liu, 2020; Liu, Li, & Liu, 2014). In this study, Cronbach's α was 0.90.

2.2.3 Family Cohesion

Family cohesion was measured by the cohesion dimension of the Family Adaptability and Cohesion Evaluation Scale (FACES; Olson et al., 1982; Chinese version revised by Fei et al., 1991). The scale consisted of 16 items (e.g., “When there are difficulties, family members will try their best to support each other”). Each item was rated on a 5-point scale (1 = *never*, 5 = *always*), with higher total scores indicating higher levels of family cohesion. The Family Cohesion Scale has been used in Chinese college students with good reliability and validity (Li et al., 2019; Li et al., 2020; Lin et al., 2018; Ye et al., 2019). Cronbach's α for the Family Cohesion Scale was 0.89.

2.2.4 Online Aggressive Behavior

Online aggressive behavior was assessed by Adolescent Online Aggressive Behavior Scale (Gao, 2012). The scale assessed two factors related to moral disengagement including instrumental aggression and reactive aggression. Participants rated 15 items (e.g., “I often insult and scold others when playing online games”) on a four-point scale (1 = *never*, 4 = *always*). Higher scores indicated greater engagement in online aggressive behavior. The scale has been

used in Chinese college students with good reliability and validity (Jin et al., 2019; Zheng et al., 2017). In this study, Cronbach's α for the scale was 0.76.

2.3 Procedure

Due to the ongoing issue with COVID-19, questionnaires were distributed, and data collected electronically over the internet. Students were invited to participate in the survey anonymously. Researchers emphasized the authenticity, independence, and integrity of all answers to the participants. Participants provided informed consent before starting the survey.

3. Results

3.1 Preliminary Analyses

Table 1. Bi-variate Correlations of the Study Variables

Variables	1	2	3	4
1. Fear of COVID-19	-			
2. Moral Disengagement	0.23***	-		
3. Family Cohesion	-0.08***	-0.13***	-	
4. Online aggressive behavior	0.16***	0.41***	-0.14***	-

Note: $N = 2,799$, *** $p < 0.001$

Table 1 provides the Pearson correlations for the study variables. As the results show, both moral disengagement and online aggressive behavior were positively correlated with fear of COVID-19 ($r = 0.23$, $p < 0.001$ and $r = 0.16$, $p < 0.001$, respectively). In addition, fear of COVID-19 was negatively correlated with family cohesion ($r = -0.08$, $p < 0.001$). Moral disengagement was positively correlated with online aggressive behavior ($r = 0.41$, $p < 0.001$), and negatively correlated with family cohesion ($r = -0.13$, $p < 0.001$). Family cohesion was negatively correlated with online aggressive behavior ($r = -0.14$, $p < 0.001$).

3.2 Testing for Mediation Effect and Moderated Mediation Effect

Figure 2. Path Model Results

The theoretical moderated mediation model presented in Figure 1 was examined in Mplus 7.4 (Muthén & Muthén, 2015). The results of the moderated mediation model are shown in Figure 2. Fit indices for the structural model analyzing the effects of fear of COVID-19 upon online aggressive behavior revealed excellent fit (RMSEA = 0.03, 90% CI = [0.018, 0.042], SRMR = 0.02, CFI = 1.00, TLI = 1.00) based on field-normative thresholds (Hoyle, 2012; Kline, 2011). Fear of COVID-19 was positively related to online aggressive behavior ($\gamma = 0.19$, $t = 8.89$, $p < 0.001$), supporting Hypothesis 1. Fit indices for the measurement model of the moderated mediation model also indicated great fit (RMSEA = 0.03, 90% CI = [0.026, 0.033], SRMR = 0.02, CFI = 0.99, TLI = 0.99; Hoyle, 2012; Kline, 2011). Fear of COVID-19 was positively related to moral disengagement ($\gamma = 0.25$, $t = 12.55$, $p < 0.001$) and moral disengagement, in turn, was positively correlated with online aggressive behavior ($\gamma = 0.49$, $t = 24.20$, $p < 0.001$). Results indicated that that moral disengagement mediated the relation between fear of COVID-19 and online aggressive behavior, which supported Hypothesis 2. Moreover, results indicated that fear of COVID-19 remained a direct predictor of online aggressive behavior ($\gamma = 0.07$, $t = 3.31$, $p = 0.001$). Thus, moral disengagement partly mediated the relation between fear of COVID-19 and online aggressive behavior. The interaction between moral disengagement and family cohesion had a significant predictive effect on online aggressive behavior ($\gamma = -0.05$, $t = -2.17$, $p = 0.030$), supporting Hypothesis 3.

Figure 3. Association between moral disengagement and online aggression behaviors at higher and lower levels of family cohesion

Simple slope plots and calculated gamma coefficients at $-1SD$ and $+1SD$ from the mean of family cohesion are provided in Figure 3. Results of simple slope tests indicated that for college students with lower level of family cohesion, the influence of moral disengagement on online aggressive behavior stronger ($\gamma = 0.54$, $t = 23.11$, $p < 0.001$). For college students with higher level of family cohesion, the influence of moral disengagement on online aggressive behavior remained positive and statistically significant but notably weaker ($\gamma = 0.44$, $t = 15.52$, $p < 0.001$).

4. Discussion

This study tested a moderated mediation model to analyze the mechanisms underlying the association between fear of COVID-19 and online aggressive behavior among Chinese college students. Overall, findings from this study showed that fear of COVID-19 was positively related

to online aggressive behavior and this relation was partially mediated by moral disengagement. Our findings further contributed to the literature by testing a moderated mediation model, showing that the relation between moral disengagement and online aggressive behavior was moderated by family cohesion. The results help to understand the psychological processes of how fear of COVID-19 may lead to more online aggressive behavior among college students and has key implications for decreasing college students' online aggressive behavior amidst the ongoing pandemic.

4.1 The Relationship between Fear of COVID-19 and Online Aggressive Behavior

Results supported the hypothesis that fear of COVID-19 would be a positive correlate of online aggressive behavior, consistent with general findings on negative affect and aggression (Jiang, 2012; Song, 2019). Specifically, due to accumulation of fear of COVID-19, individuals may aggress others in virtual spaces as a means to relieve their negative affect and possibly cope with COVID-19 related concerns and stressors (Ma & Lei, 2010). This is in line with prior evidence of how aggressive behaviors may be forms of (maladaptive) coping mechanisms in response to negative emotional states (e.g., Bushman et al., 2001; Robertson et al., 2012; Shoss et al., 2015). Aggression in virtual spaces may be particularly important to monitor during the pandemic, as the spread of the virus has forced much of the population to transition to online for education and work. Indeed, the anonymity afforded to those in virtual spaces (Moore et al., 2012) can induce different behavioral and emotional expressions on the internet than what one would otherwise in reality (Li, 2011; Li, Wang, Zhou, & Gao, 2012). While many societies have been working towards reopening their businesses and schools, the angst of COVID-19 will likely linger for much longer. For populations that regularly engage in social interactions in the virtual

space (e.g., children, adolescents), self-monitoring may be crucial for maintaining a civil virtual social ecology.

4.2 The Mediating Role of Moral Disengagement

The present study also tested the mediating role of moral disengagement in the relation between fear of COVID-19 and online aggressive behavior. In this study, fear of COVID-19 promoted activation of moral disengagement mechanisms, which in turn was positively related to the engagement in online aggressive behavior. In other words, moral disengagement was not only an outcome of fear of COVID-19, but also a catalyst of online aggressive behavior. The first path, wherein negative emotion was related to moral disengagement was consistent with prior literature on negative emotion and moral disengagement (e.g., Caprara et al., 2013; Chen, 2016). From the perspective of evolutionary psychology (e.g., Cosmides & Tooby, 2000), a state of fear may serve as cognitive motivation to seek methods to protect oneself. During the COVID-19 epidemic, negative emotions stemming from concerns about the virus likely run high among residents and may activate moral disengagement mechanisms as a cognitive defensive mechanism (Fida et al., 2015; Paciello, Fida, Cerniglia, Tramontano, & Cole, 2012).

The second path of the mediation model, wherein moral disengagement was associated with more online aggressive behavior, was consistent with previous studies on aggression (Liu & Liu, 2020; Runions & Bak, 2015). According to Bandura's (1996) moral disengagement theory, the activation of moral disengagement will lead to the failure of the individual's moral self-regulation function and cognitively reconstruct the processing of aggressive behavior. In this study, participants' moral disengagement tendencies may have indeed served to justify or neutralize the self-restraining moral values that may otherwise deem antagonistic online behavior as morally reprehensible. In other words, the alleviation of moral guilt may paint online

aggressive behavior as more permissible. This may particularly be noteworthy given that the immediate responses or cues that would otherwise trigger guilt (e.g., facial or verbal expressions from the victimized party) are filtered out in virtual settings (Johnson, 2003). At a time where much of our social interactions have transitioned online to curb the spread of COVID-19, moral disengagement may be a pervasive value orientation that promotes greater engagement in online aggressive behavior. However, it is worth mentioning that there may be some cultural biases in this study. Specifically, the effect of moral disengagement on online aggressive behavior has been evidenced to be larger in Chinese culture compared to Western cultures (Wang et al., 2014). Thus, future studies may seek to replicate the findings of this study in Western societies to test the robustness of the model.

While moral disengagement was a mechanism that mediated the relation between fear of COVID-19 and online aggressive behavior, the remaining direct and positive effect suggests that fear of COVID-19 still independently contributed to online aggression. Thus, future studies may examine how interventions specifically targeting one's cognitive and emotional fears of COVID-19 may be managed as a strategy for reducing aggression in online interactions.

4.3 The Moderating Role of Family Cohesion

The results further revealed that family cohesion moderated the path between moral disengagement and online aggressive behavior, supporting the general notion of how familial upbringing may influence subsequent behavior put forth by the organism-environment interaction model (Lerner et al., 2006). As expected, the relation between moral disengagement and online aggressive behavior was weaker for college students who reported a higher level of family cohesion. Consistent with the risk buffering model (Bao et al., 2014), family cohesion, as

a protective factor, alleviated the influence of moral disengagement (i.e., risk factor) on online aggressive behavior.

As is known, family can provide a healthy environment for individual development (Miller, Ryan, Keitner, Bishop, & Epstein, 2000) through primary goal setting for successful achievement of a variety of basic, developmental, and crisis tasks (Skinner, Steinhauer, & Sitarenios, 2000). In this study, moral disengagement served as the cognitive tendency rationalizing the engagement in unethical behavior (e.g., online aggressive behavior) as a response to the stress and helplessness of the COVID-19 outbreak. Those with greater family cohesion may have access to using their families as outlets for stress management and have developed more adaptively to social interactions. This is in stark contrast to those with lower family cohesion who may have to resort to negative social interactions with others online as a form of maladaptive coping and compensation for the lack of familial cohesion. Indeed, college students who report weaker familial cohesion have reported feeling lonelier (Ren, 2019) and are more likely to attack others online (Sun et al., 2017).

For college students who reported high family cohesion, the relation between moral disengagement and online aggressive behavior was weaker. While family cohesion was negatively correlated with moral disengagement, suggesting that those from more cohesive families also held more immobile moral standards, the effect itself was relatively small. In other words, while family cohesion itself played a role in one's tendency to moral disengagement, it is worth noting that those who have a more cohesive family environment may also have developed more adaptive social skills to not morally disengage in situations where harm was done to another person. Given that low family cohesion strengthened the relation between moral disengagement and online aggressive behavior, special attention may be warranted for college

students with low family cohesion to prevent maladaptive deviant behavior or stress coping. Lastly, it is worth mentioning that the relation between moral disengagement and online aggressive behavior was still significant at high level of family cohesion. Thus, having family cohesion does not necessarily negate or reverse the effect entirely. The robust significance suggests that moral disengagement remains a strong antecedent of online aggressive behavior, and future studies may seek to nuance the model and examine multiple risk factors simultaneously.

4.4 Limitations and future directions

Several limitations must be considered when interpreting the results of the present study. First, the present study was cross-sectional and thus, causality cannot be inferred. Future studies may seek to design experimental or longitudinal studies to confirm the causal hypotheses in this study. Second, all measures included in this study were self-report. Future studies may try to collect data from multiple informants (e.g., family members) to deepen the current findings. Third, the sample used in this study are entirely Chinese college students, limiting the extent to which the results of the current study can be generalized across cultures. Further investigation is still needed to test the current hypotheses in across cultures.

Despite these limitations, the current study has several theoretical and practical contributions. From a theoretical perspective, this study further extends previous research by proposing a mediating role of moral disengagement and the moderating role of family cohesion. This will contribute to a better understanding of how and when fear of COVID-19 may influence online aggressive behavior. From a practical perspective, our study may provide useful insights into how social interventions may be designed to reduce college students' online aggressive behavior during a pandemic. In particular, while the transition from in-person to remote access

has brought about much benefits, the unintended consequences of greater aggressive behavior may be an important component for scholars and policymakers to be wary of. Students may benefit from increasing their self-awareness of how they may be morally disengaging differently in online interactions compared to in-person interactions. Lastly, individuals may also work to promote pleasant and open communication with their family members to provide a healthy outlet for addressing pandemic-related fears.

5. Conclusion

Although further replication and extension efforts are advised, this study represents an important step forward in unpacking how fear of COVID-19 may be related to the manifestation of online aggressive behavior among Chinese college students. Results have shown that moral disengagement serves as one potential mechanism by which fear of COVID-19 is associated with more online aggressive behavior. The focus on moral disengagement brings additional nuances in linking fear of COVID-19 to online aggressive behavior of college students. Moreover, significant moderation effect of family cohesion warrants further examination of how the influences of familial and social ecological physical environments of students transfer to the digital environment. As our social lives will inevitable become more and more intertwined with the digital world, future research may help us to better understand how we may mitigate the manifestation of negative behaviors online.

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