Is the Victim Also the Perpetrator? Infectious Mechanism and Coping Methods of Social Media Cyberbullying——The Double Buffering Effect of Trait Mindfulness

Chenyu Gu, Xiaoxia Li

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Abstract

Background: Social media cyberbullying has become a significant global public health issue. Nowadays, online violence has virus-like infectiousness and forms a cycle of bullying. Previous research has verified that bystanders can become perpetrators. However, few studies have explored the interaction between victims and perpetrators. There are indications that victims may be psychologically motivated to become potential perpetrators to "transfer pain," thus creating this cycle of bullying.

Objective: The purpose of current study is to explore the psychological motivation and verify the intervention effect of trait mindfulness in this process.

Methods: Based on the "Stressor-Strain-Outcomes" framework, the current study combines social cognitive theory and the general aggression model. It uses cognitive empathy and moral disengagement as mediators to construct an influence model of social media cyberbullying victimization experiences on cyberbullying behavior intention. Moreover, we introduce trait mindfulness as a double buffer.

Results: A questionnaire survey and data analysis of 360 social media users with cyberbullying victimization experiences revealed that: 1, cyberbullying victimization experiences have a significant positive effect on the cyberbullying behavior intention. 2, cognitive empathy and moral disengagement play mediating roles between the two. 3, trait mindfulness plays a double buffering role in this process.

Conclusions: The current study explains the infectious mechanism of cyberbullying and verifies the effectiveness of mindfulness interventions in improving the cycle of cyberbullying, and extends the investigative lens of cyberbullying to reflect the unique characteristics of Chinese online culture. It also expands the research perspective of social media cyberbullying and broadens the application of mindfulness in communication and online behavior research, reinforcing its relevance and potential in the context of Chinese internet users.

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Keywords: social media, cyberbullying, cognitive empathy, moral disengagement, mindfulness, digital health

Introduction

With the development and popularity of Internet communication technology in recent years, global Internet users have continued to grow, with 4.88 billion people using the Internet (nearly 62% of the worldwide population) and 4.55 billion of them regularly using social media[1]. Therefore, the online behavior of social media users has attracted the attention of many researchers[2]. While social media has enriched the online life of the public, it has also brought some adverse effects, such as social anxiety, image concerns, Internet addiction, cyberbullying, among which cyberbullying is particularly harmful[3]. Although cyberbullying is distinct from offline bullying and does not cause direct physical harm to the victim[4], however, it seriously threatens the psychological health of the victim[5] and even further leads to severe problematic behaviors such as suicide[6]. As the classic line from the movie Here on Earch goes, " the ruthless language, sometimes more hurt than the physical harm." Moreover, due to the anonymity of social media and the rapidity of online information dissemination, cyberbullying may cause more injuries to individuals than traditional bullying[7]. With over 1 billion Internet users and the largest number of social media users in the world, the problem of cyberbullying in China is also severe, with 14.9% of Chinese Internet users experiencing cyberbullying, and the proportion of young social media users have experienced cyberbullying is as high as 40.5%[8]. However, there are few studies on cyberbullying in China. Nowadays, cyberbullying is considered a critical public health issue, and social media platforms as the main place of cyberbullying; more than 70% of social media users have witnessed cyberbullying[9,10]. Therefore, exploring why people on social media engage in cyberbullying is necessary.

Studies have been conducted to explore the adverse effects of cyberbullying on individuals, such as health problems like depression[11], anxiety[12], sleep disorders[13], and behavioral problems like Internet addiction[14] and

suicide[15], on the one hand. The other hand is to explore the factors that influence cyberbullying, such as demographic factors like gender and age[16], psychological traits like Big Five personality and dark triad personality[17], and media environment factors like openness and anonymity[18]. Most of these studies take the perspectives of perpetrators, victims, and bystanders; however, the transitions and interactions between the three roles are still scarce [19]. Some studies suggest that bystanders may join the perpetrator's side and participate in online bullying, steering the situation in a more harmful direction[20]. A small number of studies have explored the possibility of victim transformation into new perpetrators[21]. From the perspective of interpersonal networks, this "infection" of surrounding nodes like a "virus" creates a vicious "domino cycle effect of cyberbullying[22]." Therefore, it is necessary to dig deeper into the mechanism of this role transition. In view of this, based on the SSO model (Stressors-Strain-Outcomes), the current study explores the mechanism of role transformation from victim to perpetrator, using cyberbullying victimization experiences as the stressor, cognitive empathy, and moral disengagement as the strain, and cyberbullying behavior intention as the outcome. At the same time, trait mindfulness is introduced as a moderating factor. The findings of the study provide a practical reference for the protection of public cyber health and the governance of online information behavior. The findings of the current study provide a practical reference for the protection of public online health.

Theoretical framework

Social media cyberbullying

Cyberbullying, a concept introduced by Bealsey in 2005, is defined as the intentional use of electronic devices or technology by individuals or groups to commit acts of aggression. The general consensus on cyber violence is that "a way to inflict emotional pain on others through online technology[23]." Common cyberbullying includes spreading rumors, revealing personal information or photos of others without permission, sending threatening messages, and publicly making fun of others[24,25]. Due to the unique nature of the online world, cyberbullying is different from traditional offline bullying. First, cyberbullying has a wider range of potential victims than offline bullying[26]; second, in addition to direct participation in the bullying, simply clicking "likes" and retweeting relevant content will perpetuate the victim's experience of bullying, and exposure will be increased through hashtags. Moreover, the anonymity of social media helps perpetrators to escape from moral pressure[27]. Cyberbullying is not limited by time and space and causes serious physical and psychological harm to victims on social media platforms[28]. Therefore, social media cyberbullying has attracted widespread academic attention as an important public health issue[29].

SSO model (stressors-strain-outcomes)

The SSO model was proposed by Koeske et al. to assess the process of individual responses to external environmental stresses and stimuli[30]. The model consists of three components: Stressors, Strain, and Outcomes. Specifically, individuals receive stimuli from the external environment that generate stress (Stressors), resulting in emotional and cognitive changes (Strain), which in turn lead to negative behaviors (Outcomes). Since this study explores the impact of social media users' cyberbullying victimization experiences on cyberbullying behavior intention, and the SSO model is widely used in studies related to individual negative behavior[31], there is a good match between our study and the SSO model. In addition, the SSO model has proven its usefulness and scientific validity in some relevant social media and user behavior studies[32] and is an ideal model for exploring the mechanism of individual behavioral intention formation[33]. Therefore, this study uses the SSO model as the foundation framework. Specifically, this study considers social media users' cyberbullying victimization experiences (CVE) as stressors, cognitive empathy (CE) and moral disengagement (MD) as strains, and cyberbullying behavior intention (CBI) as outcomes, while incorporating trait mindfulness (TM) as a moderator in a foundational framework to explore the mechanisms of social media cyberbullying victim-to-perpetrator role transformation.

Victim-to-perpetrator: the impact of CVE (stressors) on CBI (outcomes)

The impact of cyberbullying victimization experiences is an essential part of cyberbullying research. It has been found that the experience of cyber violence victimization can cause many

95   traumas and lead to problematic behaviors in individuals[34], such as depression, stress, anxiety, low self-esteem, internet addiction, and even suicide[29]. Recently, scholars have focused on the contagiousness of cyberbullying on social media; similar to a "virus," for instance, bystanders may join the bullying party because they witnessed cyberbullying[35], and even victims may become potential perpetrators[21].

100   Social cognitive theory (SCT) is often used to explain individual behavior. The theory assumes that there is a dynamic interaction between the individual, the environment, and behavior and that individuals actively relate their past experiences, emotional states, and personal beliefs and apply them to decode and respond[36]. In brief, this process involves three components: environmental stimuli, individual cognition, and behavioral decision-making. Social cognitive theory has been
105   widely applied to the study of cyberbullying, and these studies generally consider cyberbullying victimization experiences as an environmental stimulus and believe that it changes individual behavior[37]. For example, a study demonstrated that cyberbullying victimization experiences significantly reduce the continuous usage of social media users[38]. Some studies have also discussed the effects of cyberbullying on bystanders' behavior. However, few studies have examined the
110   effects of cyberbullying victimization experiences on victims' cyberbullying behavior intention[39]. Previous research has shown that offline bullying experiences are associated with bullying behaviors[40]. Individuals who are bullied in real life are more likely to bully others online[41] because an individual's victimization experience may lead to more hostility and aggression towards others in the future, and people will retaliate against others for the pain they have suffered in order to feel
115   more balanced[42]. Although social media cyberbullying is a kind of online aggression that does not result in an actual physical assault, the psychological mechanisms of this retaliation are very similar. In addition, the media effect model (MEM) suggests that media can influence the audience's thoughts and behaviors, especially aggressive behaviors[43]. Therefore, the current study suggests that there is a link between cyberbullying victimization experiences (Stressors) and cyberbullying
120   behavior intention (Outcomes); in other words, cyberbullying victims may become perpetrators. However, the mechanisms between role shifts need to be explored in more depth.

The mediating role of moral disengagement (strains)

      Bandura proposed the concept of "moral disengagement" based on social cognitive theory, which is an undesirable cognitive tendency for individuals to minimize their responsibility for the
125   consequences of their actions, to reperceive their actions, and to feel less guilt and shame towards their victims by shutting down their "moral agency," which is an important cognitive factor for individuals to justify their unethical behavior. This is a good explanation of why people do not feel pain and self-blame even when they commit hurtful acts[44]. Numerous studies have shown that moral disengagement is an important factor in the aggressive behavior of individuals[45,46], especially
130   some offline bullying behaviors[47]. In order to avoid negative self-evaluation and to escape from moral shame, perpetrators may suggest to themselves that their bullying behavior did not cause much pain to the victim or that the victim deserved it[48]. However, moral disengagement has been shown to be associated with offline bullying; however, whether it is equally applicable to explain cyberbullying needs to be validated by more research[49]. Several studies claim that in the online
135   environment, perpetrators may not be under the same moral pressure as offline[50] and that such virtual online worlds are somewhat unrestricted, which leads to moral disengagement[51]. Such an online environment exacerbates moral disengagement, as the wide diffusion of responsibility and unclear attribution allows perpetrators to freely explain their bullying behaviors[28], which allows perpetrators to commit cyberbullying more comfortably. Bandura, the originator of the concept of
140   moral disengagement, has also stated that "we should better understand the moral disengagement

in online interactions rather than demonize the Internet." Based on the above logic, this paper proposes the following research hypothesis:

H1a: Moral disengagement positively influences individuals' cyberbullying behavior intention.

Then do the cyberbullying victimization experiences increase moral disengagement? According to social cognitive theory, moral disengagement as cognition is influenced by the external environment. Previous research has confirmed that the victimization experience directly influences individuals' moral perceptions of aggression, making individuals morally perceive aggression as normal[52]. An individual's past bullying experience is an important influence on his or her learning and development of aggressive behavior[53], and this cycle of bullying is mediated to a significant degree by moral disengagement[54]. The general aggression model (GAM) also suggests that input variables (e.g., victimization experiences) can have an impact on an individual's internal cognition, which in turn influences the individual's behavioral decisions[55]. Thus, this study proposed the following hypothesis:

H1b Cyberbullying victimization experiences positively influence moral disengagement.

H1c Moral disengagement mediates the relationship between cyberbullying victimization experiences and cyberbullying behavior intention.

The mediating role of cognitive empathy (strains)

Empathy is defined as the ability to perceive another person's emotions, meaning that one person is "infected" by another's emotions. Empathy is divided into affective empathy and cognitive empathy, the former is mainly concerned with emotional contagion while the latter allows to some extent, for reflection and rational thought, but the two are not completely independent[56]. There are still contradictions regarding the relationship between the two types of empathy and bullying; Walters et al.'s study found no direct association between bullying behavior and empathy[57], while Williford et al.'s study pointed out that this was due to the difference between the two types of empathy, so he split emotional and cognitive empathy and verified that cognitive empathy could significantly reduce bullying behavior[58]. Since cognitive empathy is better suited to the use of psychological theories[59], and the current study is based on a social media context where the lack of nonverbal and paralinguistic related social cues in online contexts may hinder the activation of affective empathy[60], this study focuses on cognitive empathy.

Previous research has shown that the environment of interpersonal interactions significantly affects individuals' cognitive empathy levels[61] and that environment of continuous bullying impairs individuals' cognitive empathy[62]. And the environment, as indicated by social cognitive theory, can influence an individual's emotional cognition, which includes cognitive empathy[44]. The social exclusion experience reduces an individual's ability to empathize and makes the victim numb, and cyberbullying is, to some extent, a form of social exclusion[63]. Therefore, the present study suggests that individuals with more cyberbullying victimization experiences may have lower levels of cognitive empathy. With this low empathy level, perpetrators may not be aware of the consequences of their behavior on victims, and therefore they do not believe they are to blame for their behavior, thus increasing the likelihood of cyberbullying behavior intention[64]. In short, cyberbullying victimization experiences decrease individuals' cognitive empathy, which in turn increases individuals' cyberbullying behavior intention; therefore, this paper proposes the research hypothesis:

H2a: Cognitive empathy mediates the relationship between cyberbullying victimization experiences and cyberbullying behavior intention.

As discussed before, cyberbullying victimization experiences reduce cognitive empathy and increase moral disengagement, while a large amount of research has demonstrated that empathy is

an important personal trait for reducing moral disengagement[65,66]. Because individuals with higher levels of empathy are better able to perceive the pain of bullying in others, this contradicts moral disengagement. Based on the above logic current study proposes the research hypothesis as follows:

H2b: Cognitive empathy mediates the relationship between cyberbullying victimization experiences and moral disengagement.

H2c: Cognitive empathy and moral disengagement mediate the chain between cyberbullying victimization experiences and cyberbullying behavior intention.

The triple buffer hypothesis of trait mindfulness

The concept of mindfulness arises from meditation training in Buddhism, which refers to the intensity of attention[67]. In research, mindfulness is generally divided into state mindfulness and trait mindfulness[68], the trait mindfulness refers to one's ability to focus on what is happening in the present moment; it can be seen as a stable state of mind that requires one to consciously focus on a fixed object and pay attention to the present moment. In brief, it can refer to an awareness of the situation and a non-judgmental attitude towards any thought or feeling[69]. To explore sustained rather than transient behavioral effects, the present study focused on trait mindfulness. Trait mindfulness is believed to be effective in mitigating the damage caused by some negative stimuli to an individual's mental health[70] and increasing the individual's subjective well-being[71]. Since social media poses some serious mental and behavioral problems to users[72], there is a great need to explore the application of mindfulness in the social media context.

Several previous studies have investigated the relationship between trait mindfulness and moral disengagement and concluded that trait mindfulness could be effective in reducing moral disengagement[73,74]. Because in mindfulness, values are placed on awareness of the behavior and attention to the moment being experienced rather than judging it or responding to it, individuals with high trait mindfulness are better able to hold on to their values[75] and less likely to shut down their "moral agency" thus creating moral disengagement. Recently, several studies on cyberbullying have pointed to the possibility that mindfulness can significantly reduce cyberbullying behavior[76,77]. Since mindfulness represents a trait of focused calmness and self-restraint, it increases the likelihood that individuals will overcome impulsive aggression and reduce aggressive behavior. Furthermore, according to the General Aggression Model (GAM), an individual's internal trait can inhibit the tendency to violence, and mindfulness as a non-judgmental stable mental trait may be a critical factor in hindering cyberbullying[78]. In addition to direct effects, trait mindfulness often acts as the moderator[79], and the stress buffer hypothesis of mindfulness suggests that mindfulness has a positive effect on individuals' mental health and problem behaviors and mitigates further conversion of negative cognitions to problem behaviors[80]. Mindfulness as a non-judgmental and accepting attitude can intervene in the pre-behavioral assessment process[81]. Specifically, social media users with higher levels of trait mindfulness are less likely to develop moral disengagement into cyberbullying behavior. In summary, the current study proposes the following "triple buffer of trait mindfulness" hypothesis:

H3a: Trait mindfulness negatively influences moral disengagement.

H3b: Trait mindfulness negatively influences cyberbullying behavior intention.

H3c: Trait mindfulness negatively moderates the effect of moral disengagement on cyberbullying behavior intention.

To sum up, considering the multifaceted nature of cyberbullying and the intricate interplay of psychological factors involved, it becomes imperative to dissect the mechanisms that govern the transition from victimization to potential perpetration. As the literature suggests, the experience of

being bullied does not exist in isolation; rather, it interacts with individual traits and cognitive processes that can significantly influence the likelihood of engaging in cyberbullying behaviors. Therefore, to investigate these relationships and extend our understanding of cyberbullying dynamics, this study posits the subsequent research questions:

RQ1: How does the cyberbullying victimization experience influence the cyberbullying behavior intention? Are there factors that mitigate this influence?

RQ2: To what extend does moral disengagement, cognitive empathy, and trait mindfulness mediate the direct relationship between cyberbullying victimization and behavior (indirect effect)?

Conceptual model

Based on the above information, the research model of this paper is shown in **Figure 1**, while in the model, we use gender, age, education background and social media usage duration as covariates.
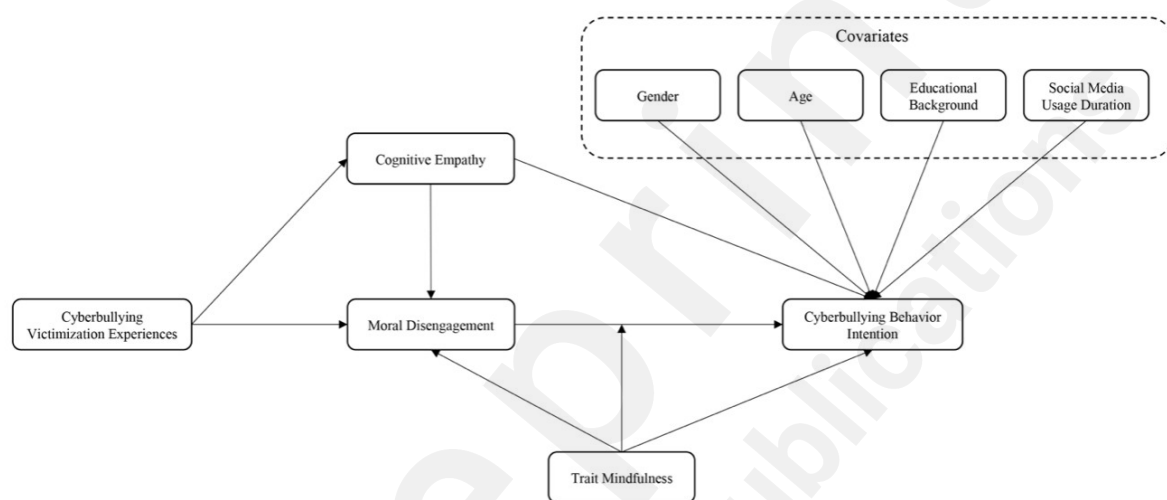
Figure 1. Conceptual model.

Material and methods

To ensure that our samples have experience in using social media, we recruit participants through social media platforms. At the same time, we have to confirm that these participants are over 18 years old. Our study was a cross-sectional study to test the relationship between their cyberbullying victimization experiences, cognitive empathy, moral disengagement, trait mindfulness, and cyberbullying behavior intention. With the aim of ensuring that questions were clearly worded, the questionnaire was pretested in a small group of participants. Participants were informed of their right to withdraw, confidentiality, and anonymity prior to taking the survey. Computers, tablets, and mobile phones were all used to complete the cross-sectional survey. After consent, participants began to answer our formal questionnaires.

Participants and Procedures

Since this study aimed to explore the impact of cyberbullying victimization experiences, the participants were selected to include social media users who had cyberbullying victimization experiences. The study used a questionnaire to recruit participants through social media networking platforms between June 2022 and July 2022 in order to ensure that all participants had experience with social media use. A total of 715 questionnaires were finally distributed, and 360 valid questionnaires were obtained after the screening, with an effective rate of 51.43%. For the invalid questionnaires, the deletion was mainly based on: 1; The participant was under the age of eighteen. 2, The answers had never experienced social media cyberbullying. 3, The screening questions did not meet the criteria. 3, The answer time was less than 30 seconds, or the answers were exactly the

same for several consecutive questions. Detailed demographic information of the sample is shown in **Table 1**.

Table 1. Statistical table of basic information of effective samples

Statistical Items	Specific Content	Statistical Value	Percentage
Gender	Male	118	32.8%
	Female	242	67.2%
Age	18–26	97	26.9%
	27–40	235	65.3%
	41–55	17	4.7%
	Over 50	11	3.1%
Educational Background	High School	14	4.2%
	Undergraduate	215	59.7%
	Master and Doctor	130	36.1%
Social Media Usage Duration	Less than 1 hour/ day	13	3.6%
	1-3 hours/ day	131	36.4%
	3–5 hours/ day	120	33.3%
	5 hours/ day	96	26.7%

Measurements

The instrument of this study included measures of cyberbullying victimization experiences, cognitive empathy, moral disengagement, trait mindfulness, and cyberbullying behavior intention. The questionnaire of this study is developed following the pre-validated scales. Sub-items within each scale were averaged, resulting in composite scales. In consideration of the overall data analysis, this questionnaire adopts the Likert 7-point for all scales. Because some of the scales in the study were derived from English literature, two English masters were invited to translate the scales in both directions, and 10 volunteers were pretested after translation to ensure that all the items were clearly and accurately stated.

The cyberbullying victimization experiences scale and cyberbullying behavior intention scale were referenced from Patchin's study[82]. The original scale is a 9-item self-reported scale; however, our pretests revealed that social media users do not experience cyberbullying in all four types (comments, pictures, videos, and web pages), which leads to bias affecting the overall reliability of the scale. After discussion, we finally combined these four forms in this study because they collectively express the measurement purpose of " others transmit invasive and harmful information to me on social media." The final questionnaire contained a 5-item measuring cyberbullying victimization experiences (e.g., "Someone has spread rumors about me on social media") and cyberbullying behavior intention ("I don't mind hurting people through private messages on social media").

The cognitive empathy scale was developed from the empathy scale in Feshbach et al.'s study [83]. The original scale contains 5 cognitive empathy items and 7 affective empathy items, which have been widely used in empathy research[84,85]. And then, Park translated it into Chinese and Korean and

verified that the scale can be effectively applied to East Asian samples[86]. Therefore, our study refers to the cognitive empathy section of the scale and adapts it to social media contexts, resulting in 5 cognitive empathy items (e.g., "I perceive changes in other people's feelings during social media interactions.").

The moral disengagement scale was derived from a related study by Moore et al[87], while the original scale was later revised and validated for its application in social media contexts by Cao et al[88]. This paper applies 8 items scale to measure moral disengagement on social media (e.g., "It is not a fault to slightly exaggerate one's qualifications on social media") with reference to both studies.

The trait mindfulness scale was based on the mindfulness scale developed by Turel and Osatuyi et al[89], they adapted the original mindfulness questionnaire to a version applicable to the social media environment, which has also been utilized by many other scholars[90]. This version was also used in our study to measure the level of trait mindfulness (e.g., "I am easily distracted, I am always distracted when I do something") through 5 items.

Data analysis

Given the exploratory nature of this study, we elected to employ the partial least squares (PLS) path analysis method, utilizing the Smart PLS software, to test our proposed model. This decision was guided by the objective of exploring and developing a theoretical understanding of the relationships among the variables of interest, rather than confirming a pre-established theoretical structure. The PLS approach is particularly adept at handling complex models and is robust against violations of normality, making it well-suited for the early stages of theory development[91].

To ensure a comprehensive examination of the model, we included pertinent covariates such as gender (0 = Female, 1 = Male), highest degree attained, age, and daily social media usage length. These covariates were selected based on their potential relevance to the cyberbullying constructs being explored and their capacity to account for variance in the model outside of the primary constructs of interest.

We recognize that PLS path analysis is fundamentally an exploratory method, and as such, the results should be viewed as hypotheses-generating rather than confirmatory. This methodological choice is aligned with the aim of this study to pave the way for future research that can further test and substantiate the relationships identified here using more confirmatory statistical approaches. Future research could thereby benefit from applying structural equation modeling (SEM) with latent variables, which would offer a more stringent test of the model's constructs and their interrelations, thus enhancing the robustness and generalizability of the findings.

Results

Measurement of model

As shown in **Table 2**, the factor loadings for all measure items of the scale ranged from 0.580 to 0.938, indicating that all measure items were retainable. The Cronbach's α values for the latent variables were greater than 0.8, indicating that the internal consistency of the scales met the requirements, and all the CR values were greater than the standard value of 0.7, indicating that the combined reliability of the scales met the requirements[92]. The AVE values between all variables were greater than the accepted value of 0.5, indicating that the convergent validity between the variables met the criteria[93]. In addition, the VIF values for all factors were below 10, thus indicating that the scale does not suffer from multi-collinearity[94].

This study next verified the discriminant validity among the variables, and the results are shown in **Table 3**, where the square root of the AVE values of all variables was greater than the Pearson correlation coefficient among the variables, so the discriminant validity of the scale met the

requirements[93]. We then used the Harman single factor test to test the common method bias of the data, and there was a total of five factors with unrotated eigenvalues greater than 1. The variance of the first factor obtained by un-rotation was 27.091%, which was less than the critical value requirement of 40 %, so there was no common method bias in this study.

Table 2. Reliability and convergent validity analysis

Latent Variable	Items	Factor Loadings	VIF	Cronbach's α	CR	AVE
Cyberbullying Victimization Experiences（CVE）	CVE1	0.780	1.978	0.897	0.923	0.707
	CVE2	0.873	4.263			
	CVE3	0.697	4.030			
	CVE4	0.859	2.599			
	CVE5	0.806	2.780			
Cognitive Empathy（CE）	CE1	0.791	1.849	0.893	0.921	0.700
	CE2	0.811	2.153			
	CE3	0.849	2.652			
	CE4	0.873	2.908			
	CE5	0.855	2.240			
Moral Disengagement（MD）	MD1	0.723	1.848	0.873	0.900	0.534
	MD2	0.611	1.411			
	MD3	0.813	2.853			
	MD4	0.857	3.876			
	MD5	0.718	2.074			
	MD6	0.748	2.489			
	MD7	0.756	2.434			
	MD8	0.580	1.395			
Trait Mindfulness （TM）	TM1	0.938	6.140	0.956	0.966	0.849
	TM2	0.911	4.389			
	TM3	0.937	6.788			
	TM4	0.918	5.186			
	TM5	0.903	3.325			
Cyberbullying Behavior Intention（CBII）	CBI1	0.780	1.889	0.865	0.902	0.649
	CBI2	0.873	2.685			
	CBI3	0.697	1.619			
	CBI4	0.859	2.145			
	CBI5	0.806	2.210			

Table 3. Discriminant validity analysis

	CVE	MD	CE	CBI	TM
CVE	0.841				
MD	0.455	0.731			
CE	－0.311	－0.388	0.836		
CBI	0.373	0.383	－0.097	0.806	
TM	－0.017	0.003	0.079	－0.315	0.922

Notes: CVE= Cyberbullying Victimization Experiences, CE= Cognitive Empathy, MD= Moral Disengagement, CBI= cyberbullying behavior intention, TM= Trait Mindfulness

Then we tested the model fit. Firstly, by PLS Algorithm, the R^2 values of each variable were
350 greater than the accepted value of 0.1, indicating that the model has good predictive accuracy [95];
next, by Blindfolding, the values of each variable Stone-Geisser Q^2 were greater than 0, indicating
that the model can predict correlations well[96]; meanwhile, the SRMR value was 0.068 is less than
0.08, indicating that the model has a good fit[97], and the RMS Theta value is 0.13, indicating good
model fitness again.

Research hypothesis testing
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Subsequently, the Bootstrapping test with a capacity of 5000 was selected for the original data
according to the suggestion of Hair[91] to find the significance of the path coefficients in the model,
and the final test results of the model are shown in **Table 4** and **Figure 2**.

360 **Table 4.** Hypothesis testing results

Direct Effect	Path Coefficient	T	p		Result
H1a: MD → CBI	0.344	6.792	0.000***		Valid
H1b: CVE → MD	0.369	8.115	0.000***		Valid
H3a: TM → MD	0.031	0.601	0.548		Invalid
H3b: TM → CBI	−0.340	7.095	0.000***		Valid
Indirect Effect	Effect Value	T	95% Boot CI	p	Result
H1c: CVE → MD → CBI	0.129	4.839	[0.080，0.183]	0.000***	Valid
H2a: CVE → CE → CBI	−0.029	1.877	[−0.060，0.004]	0.061	Invalid
H2b: CVE → CE → MD	0.087	4.231	[0.050，0.128]	0.000***	Valid
H2c: CVE → CE → MD → CBI	0.030	3.702	[0.016，0.047]	0.000***	Valid
Moderating Effect	Effect Value	T	p		Result
H3c: TM*MD → CBI	−0.149	2.915	0.004**		Valid

Notes: CVE= Cyberbullying Victimization Experiences, CE= Cognitive Empathy, MD= Moral
Disengagement, CBI= cyberbullying behavior intention, TM= Trait Mindfulness

As shown in **Table 4**, H1a, H1b, H1c, H2b, H2c, H3b, and H3c held while H3a and H2a do not.
365 Specifically, social media users' cyberbullying victimization experiences positively influences moral
disengagement, which in turn results in a higher cyberbullying behavior intention, with moral
disengagement mediating this process (95% Boot CI = [0.080, 0.183]). At the same time, the
individual's cognitive empathy can effectively inhibit the generation of moral disengagement.
Unfortunately, the cyberbullying victimization experience not only increases an individual's level of
370 moral disengagement, but also inhibits an individual's cognitive empathy, thereby exacerbating the
condition of moral disengagement. Thus, cognitive empathy plays a negative mediating role in the
effect of the cyberbullying victimization experience on moral disengagement (95% Boot CI = [0.050,
0.128]), and cognitive empathy and moral disengagement chained mediated the effect of
cyberbullying victimization experience on cyberbullying behavior intention (95% Boot CI = [0.016,
375 0.047]). However, cognitive empathy does not directly influence cyberbullying behavior intention.

Trait mindfulness can significantly reduce individual cyberbullying behavior intention. However, Trait mindfulness does not significantly influence moral disengagement.

380   As shown in **Figure 2**, trait mindfulness negatively moderated the effect of moral disengagement on cyberbullying behavior intention, with a weaker effect of moral disengagement on cyberbullying behavior in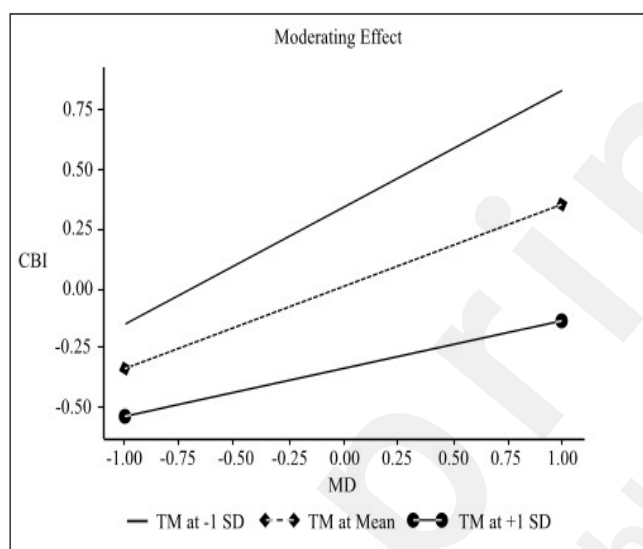tention when individual trait mindfulness was strong (+1 SD) and a stronger effect of moral disengagement on cyberbullying behavior intention when individual trait mindfulness was weak (-1 SD).

Figure 2. The interaction between MD and TM on the CBI is tested using a simple slope test.

385   ## Discussion and conclusion

The purpose of current study was to explore the impact of social media users' cyberbullying victimization experiences on their cyberbullying behavior intention to reveal a mechanism of role change between victims and perpetrators. To further elucidate the intricate dynamics at play, we selected specific psychological constructs – namely moral disengagement, cognitive empathy, and

390   trait mindfulness – to examine their mediating and moderating effects. Additionally, we considered various covariates such as age, gender, and frequency of social media use, to control for their potential confounding impact on the relationships being investigated. The result model of the study is shown in **Figure 3**, and the above section provides a complete answer to our research question.
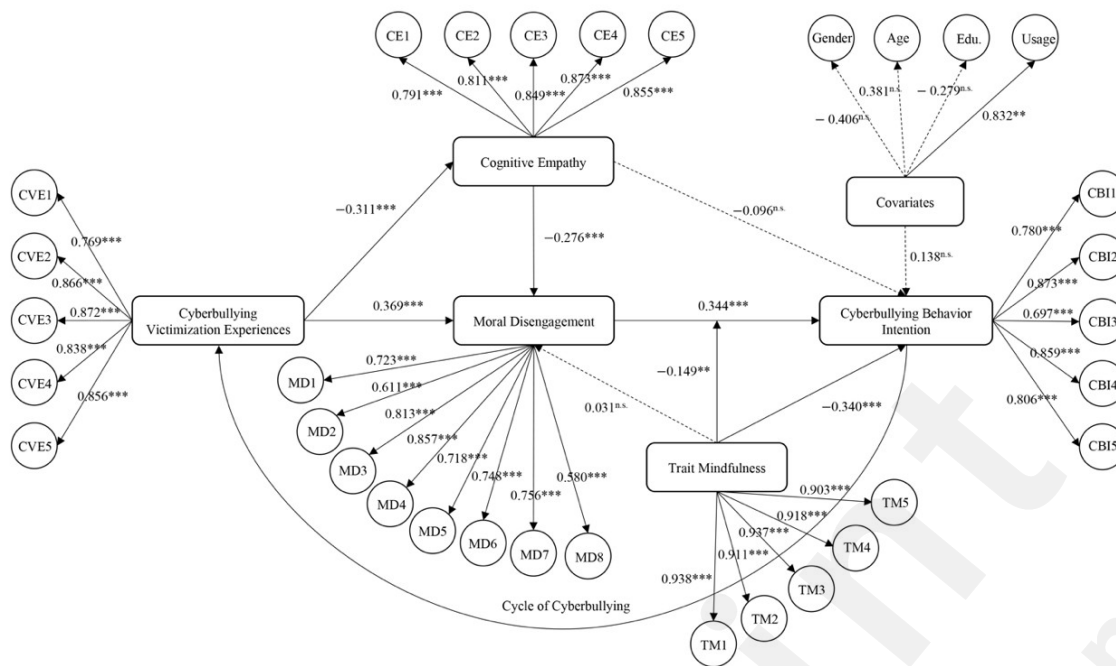
Figure 3. The result model.
Notes: Dashed lines represent nonsignificant relation. The arc represents CBI may create new CVE.
n.s p>0.05; * p<0.05; ** p<0.01; *** p<0.001

The Victim-Perpetrator Cycle of Cyberbullying: The Mediating Roles of Moral Disengagement and Cognitive Empathy

The present study found that individuals' cyberbullying victimization experiences in social media contexts significantly influenced their cyberbullying behavior intention, which also suggested the possibility of changing the role from victim to perpetrator, further supporting previous research and building on it to reveal the mechanism of role change[21]. We also found the mechanism is similar to the bystander-to-perpetrator transition, both of which can be explained by an increase in moral disengagement[46]. In addition, the effect of cyberbullying victimization experiences on moral disengagement can be mediated by cognitive empathy, and previous research has verified the negative effect of bullying victimization on cognitive empathy[98] and the negative association between cognitive empathy and moral disengagement[99], and the present study further reveals the mediating role of cognitive empathy between cyberbullying victimization experiences and moral disengagement. However, cognitive empathy did not significantly and directly influence cyberbullying behavior intention but was mediated through moral disengagement.

The findings of the current study are also consistent with Social Cognitive Theory (SCT) and the General Aggression Model (GAM). Cyberbullying victimization experiences, moral disengagement, and cyberbullying behavior intention form a complete model of aggression formation, in which cyberbullying victimization experiences, as an antecedent variable of environmental stimuli, need to be mediated by individuals' internal cognitive processes (moral disengagement and cognitive empathy) to further influence cyberbullying behavior intention. Moreover, social learning theory also states that moral disengagement originates from social learning and that this cognitive inclination is influenced by the socialization process[100]. Unfortunately, individuals often rationalize cyberbullying behaviors. This rationalization frequently stems from their own experiences as victims of cyberbullying. While at the same time, cognitive empathy, which can serve as an inhibiting factor for moral disengagement, is impaired in the process of experiencing cyberbullying victimization. Therefore, victims of cyberbullying have a higher cyberbullying behavior intention and join the

perpetrators, completing the role change from victim to perpetrator. When victims become new potential perpetrators, there will be new victims, and so on and so forth, to form a cycle of cyberbullying, which seriously endangers the online environment and brings serious challenges to public health.

Interventions in the Cycle: The Double Buffering Effect of Trait Mindfulness

Trait mindfulness as a positive personality has been shown to be effective in improving individuals' mental health and mitigating online behavioral problems[101] and therefore has gained attention and become an interdisciplinary research topic in various research fields (including sociology, family studies, information behavior, education, philosophy, economics, organizational science, etc.). Our research introduced trait mindfulness as a mitigating factor in the cycle of cyberbullying. We find trait mindfulness effectively moderates the effect of social media users' moral disengagement on cyberbullying behavior intention. Specifically, users with higher (lower) levels of trait mindfulness were less (more) likely to engage in cyberbullying. In addition, trait mindfulness directly inhibits the growth of cyberbullying behavior intention. Yet we also found that trait mindfulness was not directly related to moral disengagement. Overall, although the triple buffering effect of mindfulness originally expected in our study was only achieved in two cases, the trait mindfulness had a real buffering effect on the vicious cycle of cyberbullying, and the importance of mindfulness for public health was again highlighted.

Implications

From a theoretical perspective, the contributions of this study include: (1) Cyberbullying has become a serious public health problem, and existing studies have paid attention to the role of interaction between bystanders and perpetrators in cyberbullying incidents; however, insufficient attention has been paid to the role change of victims, and this paper confirms the possibility of the role changing from victims to perpetrators in social media contexts. (2) By introducing two mediating factors, moral disengagement, and cognitive empathy, this study theoretically explores the mechanism by which the role of the victim shifts to the perpetrator, enriching the study of the psychology and behavior of social media users and providing insights for further research. (3) After revealing this mechanism of cyberbullying contagion, this study not only provides a practical reference for improving the cycle of cyberbullying by introducing the factor of trait mindfulness as a mitigating method but also enriches the application of mindfulness in the field of communication and online behavior research.

From a practical perspective, the contributions of the present study include: (1) If cyberbullying makes victims become potential perpetrators, it is necessary to curb the generation of cyberbullying at the source. In light of our research findings, we propose a comprehensive set of strategies for the governance of cyberbullying, emphasizing the need for a synergistic approach. First, the adoption of advanced online monitoring tools leveraging artificial intelligence and machine learning is crucial for the proactive identification of cyberbullying instances, coupled with streamlined processes for efficient and secure reporting by users. Concurrently, educational initiatives are paramount; hence, we advocate for collaborative efforts between government bodies and educational institutions to deploy digital citizenship programs that underscore the ethical use of the internet, elucidate the consequences of cyberbullying, and promote constructive online engagement, particularly among younger internet users. Updating and rigorously enforcing cyberbullying legislation to reflect the dynamic nature of the digital domain is another cornerstone of our recommended approach. This would entail clearly defining cyberbullying within the legal framework, devising proportional punitive measures, and ensuring cross-platform legal applicability. In addition, forging partnerships with technology companies is critical to establish and maintain online standards and policies that

470   proactively deter cyberbullying, thereby fostering safer digital environments. Lastly, our strategy underlines the indispensable role of research and data-driven policymaking in assessing the impact of cyberbullying countermeasures and in formulating adaptive, evidence-based policies that resonate with the evolving digital ecosystem. Collectively, these measures represent a multifaceted framework informed by our study's conclusions to effectively regulate and mitigate the pervasive

475   issue of cyberbullying. (2) Mindfulness training should be actively introduced to enhance the level of individuals' mindfulness level to effectively curb the negative effects of cyberbullying at the personal level. In addressing the detrimental impacts of cyberbullying, it becomes imperative to focus not only on systemic and preventive measures but also on empowering individuals to withstand and recover from such adversities. Our study underscores the pivotal role of mindfulness

480   training as an effective tool for enhancing individuals' resilience against the psychological toll of cyberbullying. By actively incorporating mindfulness training into educational curricula and workplace wellness programs, we can foster an increased level of mindfulness, which equips individuals with the mental and emotional fortitude to navigate the complexities of digital interactions.

Limitations and future directions

485   Although some valuable findings were explored in this study, there are some limitations. First, in our study, we mainly used trait mindfulness; while the meaning of mindfulness does not go beyond trait mindfulness, there are many other aspects and dimensions that constitute it (102). Mindfulness can be subdivided into future studies to analyze whether different dimensions of

490   mindfulness lead to different effects. Second, in the current study, we measured the variables through self-report, but some bias may have arisen due to differences in respondents' knowledge of the concept of each variable (103). A primary limitation arises from our reliance on self-report scales to measure key variables such as cyberbullying behaviors, cognitive empathy, moral disengagement, and trait mindfulness. While self-report methods are widely used in psychological

495   research due to their convenience and ability to capture subjective experiences, they are subject to certain biases. To ameliorate concerns regarding social desirability bias, we ensured the anonymity and confidentiality of the participants' responses, which has been demonstrated to improve the honesty and accuracy of self-reports. Despite these measures, self-report tools may still be influenced by individuals' willingness to report socially undesirable behaviors or by their level of

500   self-awareness. Moreover, the issue of common method variance (CMV) is a potential concern when utilizing self-report measures, as it can inflate the relationships between variables due to the shared method of data collection. We took procedural steps such as item randomization and the inclusion of reverse-scored items to minimize this risk, and our Harman's single-factor test suggested that CMV was not a dominant factor in our data set. Nevertheless, it is important for

505   future research to replicate and extend our findings using a multi-method approach. Incorporating objective measures or collateral reports, conducting longitudinal studies to assess causality more robustly, and employing experimental designs to manipulate the studied constructs could provide a more nuanced understanding of the dynamics of cyberbullying. By acknowledging these limitations, we recognize the scope for further research to refine the insights gained from this study and

510   contribute to a more comprehensive body of knowledge on the factors influencing cyberbullying behavior. Third, the cross-sectional data used in this study are insufficient to explain the cause and effect, which can be advanced in future studies through follow-up surveys or experimental methods.

        Furthermore, our methodological approach of employing partial least squares (PLS) path

515   analysis and focusing solely on observed variables was selected due to its suitability for exploratory

research and its robustness in handling complex models. While PLS path analysis facilitates the exploration and development of theoretical constructs, it does not provide the same level of confirmatory rigor as methods such as structural equation modeling with latent variables. As such, we suggest that subsequent studies consider employing confirmatory data analysis methods to test the hypotheses generated by this exploratory study rigorously. Additionally, incorporating latent variables could offer a more nuanced understanding of the constructs and potentially reveal insights that the observed variables approach may obscure. The current study's reliance on PLS path analysis, though justified within the exploratory scope of our research, implies that our findings are to be interpreted as indicative rather than definitive. We encourage future research to utilize confirmatory methodologies to further validate and refine the proposed model. Such studies should seek to operationalize the constructs with latent variables, which would account for measurement error and offer a more robust statistical representation of the data. This could provide a more precise assessment of the relationships between the constructs and strengthen the generalizability of the findings across different contexts. Finally, the current study mainly examined the role interaction between the victim and the perpetrator, and we suggest that future studies may include bystanders to discuss the role interaction between the three.

Acknowledgments

Funding

Ethical statements

The questionnaire and methodology for this study were approved by the School of Journalism and Communication, Minjiang University, Committee on Ethical Research. (Ref: MJUCER20230620).

Disclosure

The authors report no conflicts of interest in this work.

Data availability

The datasets generated during the current study are available from the corresponding author on reasonable request..

Multimedia Appendix 1

Supplementary tables and figures.

Multimedia Appendix 2

Data.

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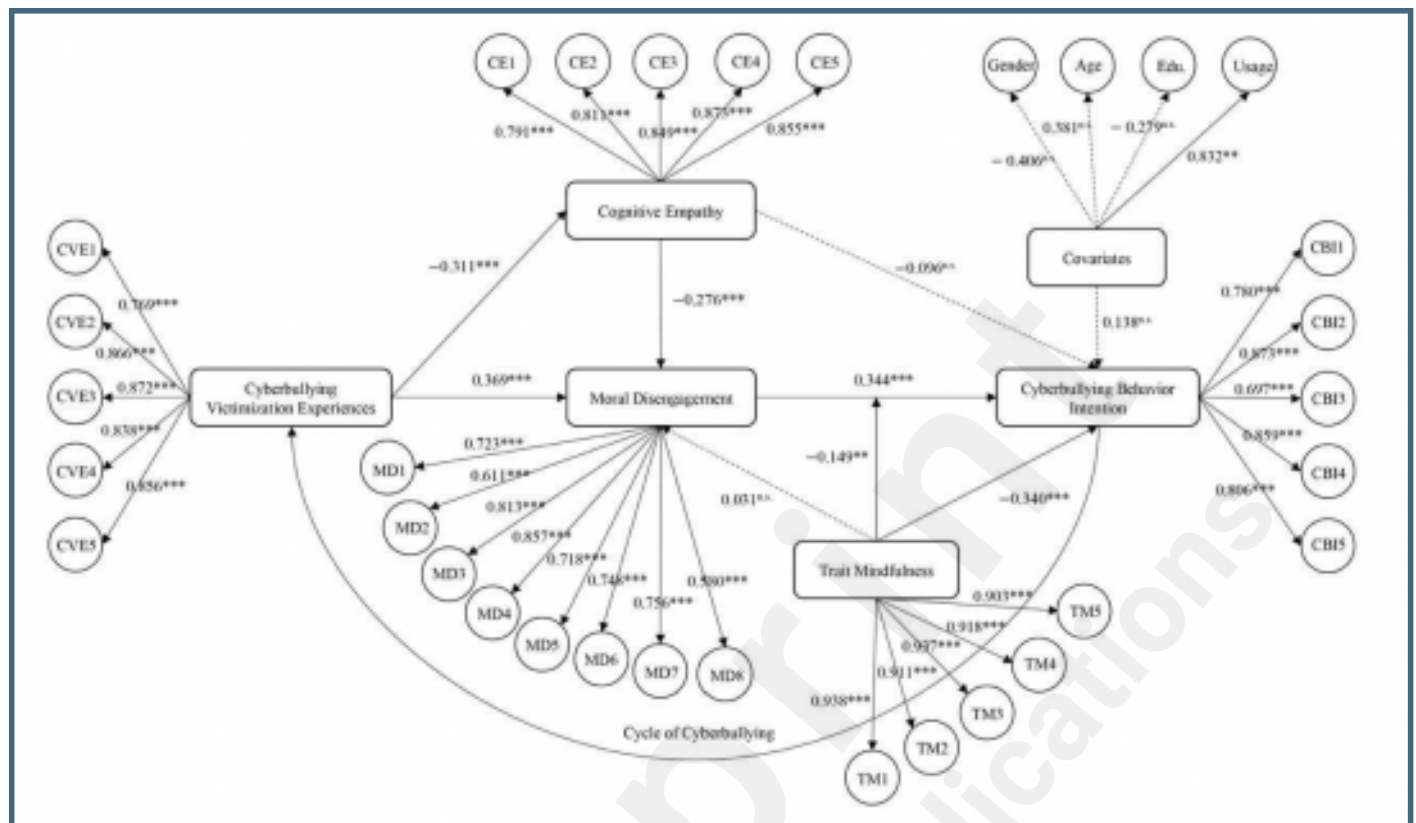
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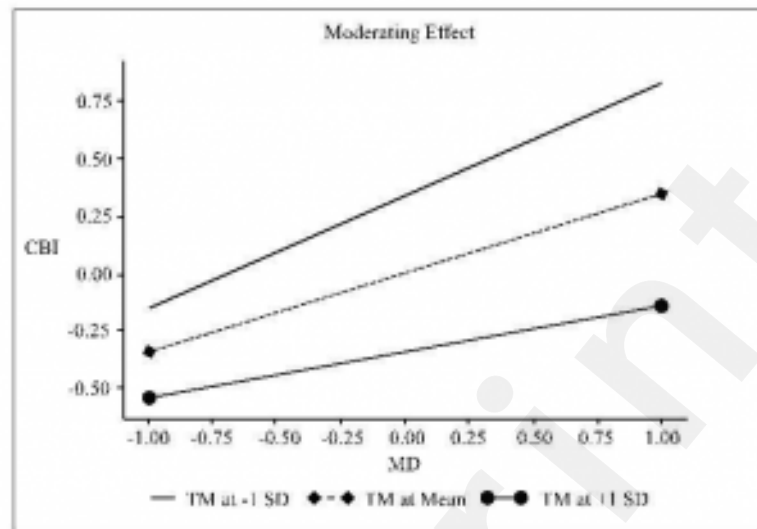cyber and traditional bullying. School Psychology International; 2012, 33(5):550-561. [doi: 10.1177/0143034312446882]

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Supplementary Files

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Figures

Conceptual model.