Emotional Intensity of Trauma Memory as Moderator of the Relationship Between Posttraumatic Cognitions and PTSD Symptoms

Ma. Jenina N. Nalipay[1,2] and Imelu G. Mordeno[3]

[1] Psychotrauma Clinic, The Graduate School, University of Santo Tomas, Manila, Philippines
[2] College of Graduate Studies and Teacher Education Research, Philippine Normal University, Manila, Philippines
[3] College of Education, Mindanao State University — Iligan Institute of Technology, Iligan City, Philippines

Individuals develop three types of cognitions in the aftermath of a traumatic experience: negative cognitions about the self, negative cognitions about the world, and self-blame (Foa et al., 1999). Although the relationship of posttraumatic stress disorder (PTSD) symptoms and posttraumatic cognitions has been supported in literature, memory-related responses affecting this relationship need further exploration. It was the intention of the present study to address this gap by examining the moderating role of emotional intensity of trauma memory in the relationship between posttraumatic cognitions and PTSD symptoms. In a sample of survivors of typhoon Haiyan ($N = 632$), one of the strongest typhoons ever recorded, it was found that in general, negative cognitions about the self and the world, but not self-blame, predict PTSD symptoms; and emotional intensity of trauma memory generally moderates the relationship between posttraumatic cognitions and PTSD. The findings of the study would be useful in the development and enhancement of interventions to help the survivors of natural disasters in maintaining their mental health and wellbeing.

Keywords: posttraumatic cognitions, emotional intensity, PTSD

Typhoon Haiyan was one of the strongest typhoons to hit Southeast Asia. With its violent rains and winds of up to 170 mph when it made landfall, it caused massive casualties of lives and properties among Filipinos (Inquirer.net, 2013). A total of 6,300 individuals died and 28,689 were injured; 1,084,762 houses were damaged, leading to homelessness and forced displacement. Moreover, billions of pesos worth of properties were damaged. Due to the massive destruction caused by typhoon Haiyan, the Philippines was declared to be a national state of calamity (Del Rosario, 2014). Aside from the deaths of loved ones and loss of properties, other problems encountered by survivors included lack of food and drinking water, absence of electricity, and the lack of means of communication and transportation, as well as poor access to basic medical care (Dash, Viswanathan, & Amin-Hanjani, 2014). These experiences were likely to have a significant impact on the mental health and wellbeing of survivors.

Although numerous studies have examined factors influencing posttraumatic stress disorder (PTSD) among natural disaster survivors, such as sociodemographic characteristics (Adams et al., 2014; Ehring, Razik, & Emmelkamp, 2011; Kun et al., 2009; Xu & Song, 2011), loss of family members, damage to properties (Chan et al., 2011; Kun et al., 2009), and lack of social support (Ehring et al., 2011), there is limited information on the internal processes involved in the development and maintenance of PTSD symptoms among samples with this type of trauma (Constans et al., 2012). Two of the factors internal to the individual that have consistently been found to be associated with PTSD are emotional intensity of trauma memory and cognition related to traumatic event.

Posttraumatic Cognitions and PTSD

The role of cognition in the development and maintenance of PTSD symptoms has been highlighted in a number of theories. Horowitz's (1986) stress response model suggests that exposure to stressful events initially gives rise to an emotional response. This is then followed by an active cognitive processing, in which the individual tries to resolve the difference between his or her traumatic experience and pre-existing beliefs. During this stage, alternating PTSD symptoms of intrusion and denial are

experienced. These continue until discrepancies are resolved. This process takes longer for individuals with more rigid pre-existing beliefs.

The stress response model has since been expounded in other theories. McCann and Pearlman (1990) hypothesised that disruptions in beliefs influenced by trauma experience may cover such themes as that of safety, trust, power, esteem, and intimacy. In addition, Resick, Schnicke, and Markway (1991) included cognitions of self-blame and undoing as a result of traumatic experience. Epstein (1991) proposed four core beliefs that change when a person experiences trauma: that the world is benign, that the world is meaningful, that the self is worthy, and that people are trustworthy. Similarly, Janoff-Bulman (1992) postulated that victimisation shatters an individual's fundamental assumptions about the benevolence of the world, meaning of life, and self-worth. These theories emphasise how the experience of trauma may alter an individual's cognition.

Consistent with the other cognitive theories of trauma, Foa and colleagues' (Foa & Kozak, 1986; Foa & Riggs, 1993; Foa, Steketee, & Rothbaum, 1989) emotional processing theory posits that when basic assumptions of safety are violated, this could lead to cognitive distortions that the world is completely dangerous and the self is entirely incompetent, which then increases the risk for the development of PTSD (Foa & Riggs, 1993; Foa & Rothbaum, 1998). They further contend that as the traumatic event disrupts normal beliefs, survivors with more rigid pre-trauma beliefs are at risk to develop PTSD (Beck, Jacobs-Lentz, McNiff, Olsen, & Clapp, 2011).

Ehlers and Clark's (2000) cognitive model of PTSD likewise focused on the central role played by cognitions in the development and maintenance of PTSD symptoms. This theory suggests that in contrast to individuals who are able to effectively resolve their trauma, those who develop PTSD experience a persistent sense of ongoing threat. Negative cognitive appraisals of the events and its consequences contribute to the perpetuation of PTSD symptoms as they trigger negative emotions and maladaptive coping mechanisms that temporarily reduce stress but prevent cognitive change, thus maintaining PTSD.

Foa, Ehlers, Clark, Tolin, and Orsillo (1999), using principal components analysis, identified three factors of posttraumatic cognitions: negative cognitions about the self, negative cognitions about the world, and self-blame. The three factors were found to be related to the severity of PTSD and were able to differentiate between individuals with and without PTSD (Foa et al., 1999; Su & Chen 2008; Van Emmerik, Schoorl, Emmelkamp, & Kamphuis 2006).

The relationships of cognitions about the self and the world with PTSD have been well established in the literature. However, the association between self-blame and PTSD failed to garner support in some studies (Beck et al., 2004; Cieslak, Benight, & Caden Lehman, 2008; Kolts, Robinson, & Tracy, 2004; Moser, Hajcak, Simons, & Foa, 2007; Startup, Makgekgenene, & Webster, 2007). A number of explanations have been proposed to account for

the differences in findings with regard to the relationship between self-blame cognitions and PTSD. Beck and colleagues (2004) suggested that this could be due to the nature of participants' trauma experience. It was noted that the participants in Foa et al.'s (1999) study were mostly survivors of sexual assault, in which self-blame reactions are more likely to be observed compared to the motor vehicle accident survivors in Beck et al.'s (2004) study. This assertion finds support from Müller et al. (2010), indicating that self-blame correlated with PTSD samples who had interpersonal trauma, but not with accident-related trauma. Conversely, Cieslak et al.'s (2008) study on survivors of child sexual abuse failed to show a significant association between self-blame and PTSD symptoms.

In contrast to the findings of Foa et al. (1999), Startup et al. (2007) found a negative relationship between self-blame and the risk of PTSD diagnosis and severity of symptoms. This was interpreted in light of the protective role of behavioural self-blame, as well as possible statistical suppression effect, since when self-blame was analysed independently, its association with PTSD was positive; however, it became negative when the contribution of negative cognitions about the self was taken into account. This was supported by the findings of Blain, Galovski, Elwood, and Meriac (2013), in which they found that higher self-blame cognitions indicate lower levels of numbing symptoms of PTSD. These inconsistencies in findings about the relationship between posttraumatic cognitions, especially self-blame, and PTSD symptoms underscore the need to investigate factors that possibly moderate this relationship.

Emotional Intensity of Trauma Memory and PTSD

The occurrence of an emotional response is inevitable when an individual is exposed to a traumatic situation, and thus may play an important part in the development of PTSD. A number of cognitive models of PTSD has acknowledged the role of emotional response as well. In Horowitz's (1976) conceptualisation of the stress response model, the initial phase of a response to stress is a state of outcry, which is characterised by an upsurge of intense, unpleasant emotions (e.g., sadness, fear). The occurrence of waves of intense emotions gives rise to symptoms of intrusion, while the numbing or blunting of these emotions leads to denial symptoms.

In Foa and Kozak's (1986) emotional response theory, fear structures develop following exposure to trauma, which may be either normal or pathological. Normal fear structure is adaptive, while pathological fear structure is characterised by associations among feared stimuli, meaning representations that distort reality, and excessive physiological and behavioural responses that lead to trauma symptoms.

The interaction between cognitions and emotions are apparent as well in Ehlers and Clark's (2000) cognitive model. This model postulates that PTSD symptoms accompanied by negative emotions such as anxiety,

depression, or anger are experienced when an individual appraises their memory of the traumatic event in a way that it produces current threat. The here-and-now quality of emotions regarding the trauma memory may lead to problematic appraisals and dysfunctional coping strategies, which further aggravate PTSD symptoms and continue the PTSD cycle.

A wide range of negative emotions that accompany PTSD symptoms have been reported in literature. These include fear, hopelessness, horror, anger, disgust, sadness, guilt, and shame (Hathaway, Boals, & Banks, 2010). Among the various properties of emotions, its intensity was found to have the greatest influence on the phenomenology of autobiographical memory. Emotional intensity was found to be a consistent predictor of recollection, belief in the memory's accuracy, vividness, narrative form, rehearsal, and visceral responses of autobiographical memory experience (Talarico, LaBar, & Rubin, 2004). Moreover, associations between emotional intensity and PTSD symptoms were also found in previous studies (Rubin, Boals, & Berntsen, 2008; St. Jacques, Botzung, Miles, & Rubin, 2011). In line with this information, we hypothesise that emotional intensity of trauma memory moderates the relationship between posttraumatic cognitions and PTSD symptoms. We consider that as trauma cognitions become more distorted, the more PTSD symptoms occur, especially if the emotional intensity of the trauma memory is high.

The Present Study

The aim of the present study was to understand the moderating role of the emotional intensity of trauma memory on the relationship between posttraumatic cognitions and PTSD symptoms. By looking at the interactions, we address a number of issues that may help understand cognitive processes explaining the symptom development and maintenance of PTSD.

For instance, most studies on cognition and trauma treat PTSD in its totality rather than focusing on its specific clusters. This is unfortunate, considering vast studies have shown differential relationships of PTSD symptoms to other constructs such as anxiety (Gutner, Nillni, Suvak, Wiltsey-Stirman, & Resick, 2013), depression (Asmundson, Stapleton, & Taylor, 2004), and suicidal behaviours (Zuromski, Davis, Witte, Weathers, & Blevins, 2014). So far, only the study of Blain et al. (2013) related posttraumatic cognitions with specific clusters of PTSD symptoms. However, the symptoms they analysed were based on the numbing model (King, Leskin, King, & Weathers, 1998) instead of the those from the *Diagnostic and Statistical Manual of Mental Disorders,* Fifth Edition (DSM-5; American Psychiatric Association, 2013).

Furthermore, results pertaining to the relationships between posttraumatic cognitions and PTSD have been inconsistent, particularly on the influence of self-blame to posttraumatic stress. Thus, we would like to know if the relationship between posttraumatic cognitions and PTSD is predicated on the moderating role of emotional intensity of trauma memory. To the authors' knowledge, this is the first study to investigate the effect of emotional intensity of trauma memory as a moderating variable in the relationship between posttraumatic cognitions and PTSD. In addition, the investigation on the dynamics of internal processes, specifically on cognition and memory, is essential, considering the extensive amount of support cognitive behaviour therapies have received from literature in terms of its effectiveness in the treatment of PTSD (Diehle, Schmitt, Daams, Boer, & Lindauer, 2014; Ehlers et al., 2013).

Methods

Participants and Procedures

The respondents of the study included 632 college student survivors of the disastrous typhoon Haiyan from a university in Tacloban, Philippines, one of the areas that was badly hit by the typhoon. The sample consisted of 20% males ($n = 127$) and 80% females ($n = 505$). The respondents' ages ranged from 15 to 31, with a mean of 18.03 ($SD = 1.783$).

A letter requesting permission for test administration was sent to the university. Upon receipt of approval, testing sessions were conducted in association with the university guidance and counselling office. All the respondents of the study gave their written informed consent prior to the data gathering. Respondents were assured of anonymity and full confidentiality when the instructions and aims of the study were explained. The study followed all applicable ethical guidelines, and the procedures have been reviewed and approved by a university ethics review committee.

Measures

The Posttraumatic Cognitions Inventory (PTCI; Foa et al., 1999) was used to measure posttraumatic cognitions. The questionnaire, composed of 33 items, assesses cognitions following a traumatic event. The items consisting of statements reflecting thoughts a person may have after a traumatic experience are rated on a scale of 1 (*completely disagree*) to 7 (*completely agree*). It has three subscales: negative cognitions about the self (21 items), negative cognitions about the world (7 items), and self-blame (5 items). Higher scores indicate more negative cognitions. The reliability coefficients of the scales are Cronbach's alpha of .904 for negative self-cognitions, .711 for negative world-cognitions, and .725 for self-blame.

To measure emotional intensity of trauma memory, the emotional intensity subscale of the Memory Experiences Questionnaire (MEQ; Sutin & Robins, 2007) was used. It is composed of six items rated on a 5-point Likert scale, ranging from 1 (*strongly disagree*) to 5 (*strongly agree*), which assesses the intensity of the emotions that were felt at the time of encoding and retrieval of the memory experience (e.g., 'As I am remembering the

experience now, my feelings are very intense'; 'My emotions are very intense concerning this event'; 'The memory of this event evokes powerful emotions'). The participants were specifically instructed to answer the items based on their experience of typhoon Haiyan. The scale demonstrated adequate reliability and strong evidence of validity (Sutin & Robins, 2007). The reliability coefficient of the data from the current sample is Cronbach's alpha of .70.

The PTSD Checklist 5 (PCL-5; Weathers et al., 2013) was utilised to measure PTSD symptom severity. It is a 20-item self-report measure based on the DSM-5 criteria of PTSD, which includes symptoms of intrusion, avoidance, negative alterations in cognitions and mood, and alterations in arousal and reactivity. The experience of each symptom is rated on a scale of 0 (*not at all*) to 4 (*extremely*). Higher scores indicate more severe experience of PTSD symptoms. The PCL-5 has an internal consistency coefficient of Cronbach's alpha of .928; the reliability coefficients of the subscales intrusion, avoidance, negative alterations in cognitions and mood, and alterations in arousal and reactivity are .829, .814, .858, and .795, respectively.

The original English forms of the measures were used in the study. The participants were bilingual speakers who use English as their secondary language. Furthermore, all of them had passed the English proficiency test required for their admission to the university, which uses English as the medium of instruction. Thus, translation of the materials was deemed unnecessary.

Data Analysis

Three moderation models predicting each symptom cluster of PTSD were analysed using Hayes and Matthes' (2009) Probing Interactions Procedure (MODPROBE), an add-on command in SPSS specifically designed for probing moderation effects in regression models. The focal predictor in model 1 was negative cognitions about the self; in model 2, negative cognitions about the world; and in model 3, self-blame cognitions. In all three models, age, sex, and the other posttraumatic cognitions were controlled for. All focal predictors and moderator were mean centred.

Results
Descriptive Statistics

The means and standard deviations of posttraumatic cognition factors, emotional intensity of trauma memory, and PTSD symptom clusters are shown in Table 1. The bivariate correlations are shown as well. All factors of posttraumatic cognitions, emotional intensity, and PTSD symptom clusters were found to be correlated with each other at $p < .01$ level.

Moderation Analyses

The results of moderation analyses are shown in Table 2. The moderation effect of emotional intensity of trauma

memory was found in the relationships of negative cognitions about the self, negative cognitions about the world, and self-blame with PTSD symptom severity. In model 1, negative cognitions about the self predicted all PTSD symptom clusters. However, its interaction with emotional intensity significantly increased the explained variance in total PTSD severity ($B = 2.266$, $p < .01$; $\Delta R^2 = .008$, $p < .01$) and in specific symptom clusters of alterations in cognitions and mood ($B = 1.006$, $p < .01$; $\Delta R^2 = .010$, $p < .01$) and alterations in arousal and reactivity ($B = .617$, $p < .05$; $\Delta R^2 = .006$, $p < .05$).

Likewise, in model 2, emotional intensity was a moderator in the relationship between negative cognitions about the world and PTSD. Whereas negative world-cognitions predicted overall PTSD symptom severity and alterations in arousal and reactivity, the explained variance increased significantly with its interaction with emotional intensity ($B = 1.693$, $p < .01$; $\Delta R^2 = .009$, $p < .01$ and $B = .440$, $p < .05$; $\Delta R^2 = .007$, $p < .05$, respectively). Furthermore, negative world cognitions predicted negative alterations in cognitions and mood only when emotional intensity was high ($B = .736$, $p < .01$; $\Delta R^2 = .011$, $p < .01$).

Similarly, emotional intensity's moderation effect was demonstrated in model 3. Self-blame alone predicted neither the total severity of PTSD, nor its specific symptoms. However, it was found that when emotional intensity is high, self-blame could lead to more severe overall PTSD ($B = 1.982$, $p < .01$; $\Delta R^2 = .011$, $p < .01$), as well as specific symptoms of intrusion ($B = .553$, $p < .05$; $\Delta R^2 = .008$, $p < .05$), avoidance ($B = .038$, $p < .05$; $\Delta R^2 = .007$, $p < .05$), negative alterations in cognitions and mood ($B = .670$, $p < .01$; $\Delta R^2 = .008$, $p < .01$), and alterations in arousal and reactivity ($B = .520$, $p < .01$; $\Delta R^2 = .008$, $p < .01$).

Discussion

The study aimed to examine the relationship of posttraumatic cognitions with each PTSD symptom cluster in a sample of natural disaster survivors, as well as find out if emotional intensity of trauma memory moderates the relationship between posttraumatic cognitions and PTSD symptom severity. The results revealed that in general, posttraumatic cognitions about the self and the world, but not self-blame, predict PTSD symptom severity among natural disaster survivors; that each posttraumatic cognition factor relates differently with specific PTSD symptom clusters; and that emotional intensity generally moderates the relationship between posttraumatic cognitions and PTSD.

Posttraumatic Cognitions as Predictors of PTSD Symptoms

The finding that self-blame did not predict PTSD complements Beck et al.'s (2004) study among vehicle accident survivors. One explanation of this result is the inference among survivors that they could not be the cause of the disaster; thus, they are likely to experience less self-blame.

Table 1

Means, Standard Deviations, and Correlations (*N* = 632)

	Variables	Mean	SD	1	2	3	4	5	6	7	8
1.	Self	2.234	.873								
2.	World	3.810	1.140	.506							
3.	Blame	2.547	1.144	.683	.485						
4.	Emotional	3.025	.616	.231	.233	.230					
5.	Intrusion	10.610	4.288	.348	.276	.248	.395				
6.	Avoidance	4.020	1.936	.356	.266	.288	.304	.660			
7.	CogMood	12.550	5.159	.563	.322	.426	.317	.653	.619		
8.	Arousal	11.240	4.061	.485	.374	.361	.306	.625	.577	.715	
9.	PTSD	38.420	13.351	.529	.365	.396	.387	.859	.772	.903	.865

Note: Self = negative cognitions about self; World = negative cognitions about the world; Blame = self-blame; Emotional = emotional intensity; Intrusion = intrusion; Avoidance = avoidance; CogMood = negative alterations in cognitions and mood; Arousal = alterations in arousal and reactivity; PTSD = posttraumatic stress disorder total score. All correlations are significant at $\alpha = .01$.

Table 2

Results of Moderation Analysis (*N* = 632)

	Intrusion		Avoidance		CogMood		Arousal		PTSD	
	B	*p* value	B	*p* value	B	*p* value	B	*p* value	B	*p* value
Model 1										
Self	1.236**	.000	.513**	.000	2.696**	.000	1.660**	.000	6.105**	.000
Emotional	2.320**	.000	.739**	.000	1.814**	.000	1.352**	.000	6.224**	.000
Self × Emotional	.413	.148	.230	.085	1.006**	.002	.617*	.018	2.266**	.005
Model R^2	.245**	.000	.191**	.000	.367**	.000	.300**	.000	.372**	.000
R^2 increase due to interaction	.003	.148	.004	.085	.010**	.002	.006*	.018	.008**	.005
Model 2										
World	.301	.058	.115	.121	.027	.879	.491**	.001	.934*	.038
Emotional	2.273**	.000	.709**	.000	1.685**	.000	1.272**	.000	5.938**	.000
World × Emotional	.354	.077	.163	.802	.736**	.001	.440*	.016	1.693**	.003
Model R^2	.246**	.000	.191**	.000	.368**	.000	.300**	.000	.373**	.000*
R^2 increase due to interaction	.004	.077	.004	.802	.011**	.001	.007*	.016	.009**	.003
Model 3										
Blame	− .200	.278	.044	.608	.178	.384	− .056	.741	− .034	.948
Emotional	2.331**	.000	.732**	.000	1.720**	.000	1.31**	.000	6.098**	.000
Blame × Emotional	.553*	.010	.038*	.017	.670**	.005	.520**	.008	1.982**	.001
Model R^2	.250**	.000	.194**	.000	.365**	.000	.301**	.000	.375**	.000
R^2 increase due to interaction	.008*	.010	.007*	.017	.008**	.005	.008**	.008	.011**	.001

Note: Self = negative cognitions about self; World = negative cognitions about the world; Blame = self-blame; Emotional = emotional intensity; Intrusion = intrusion; Avoidance = avoidance; CogMood = negative alterations in cognitions and mood; Arousal = alterations in arousal and reactivity; Covariates for all models include age, sex, and other posttraumatic cognitions; B = unstandardised coefficient.
*$p < .05$; **$p < .01$.

On the other hand, the relationship between self-blame and PTSD symptoms is more likely to be observed among victims of interpersonal trauma (Müller et al., 2010).

Negative cognitions about the self appeared to be the strongest predictor of PTSD symptom severity, as it predicted all PTSD symptom clusters. These findings support Moser et al.'s (2007) assertion that negative self-cognitions relate more to PTSD symptom severity than other types of trauma-related cognitions after finding out that self-cognitions uniquely predicted PTSD severity when variances contributed by other trauma-related cognitions, gender, and other symptoms such as depression and anxiety have been accounted for.

The result is also in accordance with the findings of Foa and Rauch (2004) that decreased negative cognitions about the self directly led to reduced PTSD symptoms, while decreased cognitions about the world were associated with reduced PTSD through its association with cognitions about the self. Similarly, Constans et al. (2012) found that among survivors of natural disaster, negative beliefs about the self related strongly with PTSD symptom severity, even after controlling for stress exposures, perceived social support, and damage to property.

The current study's finding that negative cognitions about the world predict increased PTSD is consistent with some studies (e.g., Beck et al., 2004; Cieslak et al., 2008) but is not supported by others (e.g., Shahar, Noyman, Schnidel-Allon, & Gilboa-Schechtman, 2013; Schumm, Dickstein, Walter, Owens, & Chard, 2015). However, we contend that the findings could be understood more in the context of culture. Filipinos, whose culture is more collectivist in orientation, value personalised social relationships and social harmony (Triandis, McCusker, & Hui, 1990). They embed others in settings, situations, or contexts in which their selves are connected (Markus & Kitayama, 1991). Therefore, whatever difficulties they may

experience, they expect others, particularly family and in-group members, to help and support them (Mordeno, Nalipay & Cue, 2015). Thus, the negative world cognitions brought about by a traumatic event run contrary to their pre-existing beliefs. These dissonant cognitions expectedly lead to psychological distress, which likely contribute to the increase of their PTSD level.

Emotional Intensity of Trauma Memory as Moderator

Emotional intensity was consistently found to be a moderator of the relationship between posttraumatic cognitions and PTSD symptoms. These results suggest that the relationship of PTSD symptom severity is contingent on one's emotional intensity of trauma memory. Particularly, emotional intensity interacts with negative self- and world cognitions, leading to increased alterations in cognitions and mood, and alterations in arousal and reactivity. These findings could be explained by the reciprocal relationship of the trauma memory and the appraisal of the trauma and its consequences, as postulated in the cognitive model of PTSD (Ehlers & Clark, 2000). The intense emotions an individual feels regarding the memory of the traumatic event could influence their appraisal of such memories to become more negative and problematic, thus aggravating the PTSD symptoms further. Therefore, when the intensity of emotion of the trauma memory is high, it will amplify the negative thoughts about oneself and the world. Consequently, this will naturally lead to an increased occurrence of PTSD symptoms.

Perhaps one of the most interesting findings in this study was that emotional intensity of trauma memory was found to be a moderator of the relationship between self-blame and PTSD symptoms. Additionally, self-blame's interaction with emotional intensity predicts all four clusters of PTSD symptoms. It is interesting to note that self-blame alone did not significantly predict PTSD symptoms. However, the interaction of self-blame and emotional intensity significantly increased symptoms of PTSD. Further scrutiny of the results yield that as emotional intensity of the memory increases, the relationship between self-blame and PTSD strengthens. It could be explicated therefore that the inconsistency of the relationship between self-blame and PTSD is contingent on the intensity of survivors' trauma memory. Blain et al. (2013) suggested that the intensity of emotional reactions of guilt, shame, despair, anger, and sadness is associated with heightened self-blame reactions that could ultimately result in elevated levels of PTSD symptoms.

Limitations of the Study

Notwithstanding the contributions of this study, some limitations must be considered in the interpretation of its results. First, the study utilised self-report measures, which are prone to biases such as social desirability. Moreover, while the measures of posttraumatic cognitions and PTSD symptoms have previously been used among Filipino nat-

ural disaster survivors (Nalipay, Mordeno, & Saavedra, 2015), the instruments used in this study were not specifically developed for this sample and may not fully capture these constructs in the context of the Filipino culture. Thus, further validation is recommended. Second, the participants of the study were predominantly young and female, and thus the results may not generalise to other samples. Third, although moderation analysis allows for testing of intrinsically causal relationships (Wu & Zumbo, 2008), caution must be taken in interpreting causal relationships among variables because the study employed a cross-sectional design. Fourth, only the overall emotional intensity of the participants was considered. It is possible that the participants may experience a wide range of emotions of varying intensity. It is thus suggested that specific emotions be considered in future research. Fifth, although it is evident that emotional intensity is a consistent moderator between posttraumatic cognitions and PTSD, the increment in R^2 is relatively small. This suggests that while emotional intensity moderates consistently between posttraumatic cognitions and components of PTSD, there could be other factors that may also explain the links. Future studies are needed to look into other possible moderators. Lastly, the study focused only on internal processes (i.e., cognitions and emotional intensity) involved in PTSD. Nevertheless, we acknowledge that other factors such as the social and physical aftermath of the disaster and the availability of personal, social, and material support are important as well in having a full understanding of PTSD.

Conclusion

Despite its limitations, the study was able to impart some important insights. It investigated the role of posttraumatic cognitions in the development of PTSD symptoms in a sample of natural disaster survivors; examined how each type of posttraumatic cognitions relate with each symptom cluster of PTSD; and demonstrated the moderation effect of emotional intensity of trauma memory in the relationship between posttraumatic cognitions and PTSD symptoms. Although the moderating effect sizes may be construed as minimal, the results showed that emotional intensity as a moderator is important in the context of designing and implementing appropriate interventions. In this case, for example, we contend that focusing on lowering emotional intensity (i.e., arousal reduction) will likely contribute to decreasing PTSD brought about by lowered posttraumatic cognitions.

Declaration of Interest

None.

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