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Using the social cognitive perspective, the study sought to determine the individual and environmental factors that predict disaster preparedness. Specifically, the research determined the relationships between risk perception, disaster experience, community disaster preparedness, and disaster preparedness behaviors. Data were collected from 401 participants from areas affected by recent typhoons and heavy monsoon rains: Tacloban and Metro Manila. Risk perception, severity of disaster experience, and community disaster preparedness were found to significantly predict the participants' disaster preparedness behaviors. Severity of previous disaster experience seems to be the strongest determinant of individual disaster preparedness. Implications to future research and development and improvement of disaster preparations programs are discussed.

Keywords: risk perception, severity of disaster experience, community disaster preparedness, disaster preparedness

Natural disasters have increased dramatically in frequency and intensity (Kron, 2015). In March 2015, a research conducted by risk analysis firm Verisk Maplecroft showed that eight of the ten cities most exposed to natural hazards are found in the Philippines (8 of 10 World's Most Disaster-Prone, 2015). This situation highlights the need for Filipinos to reduce their exposure to risks by developing measures

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to prepare for and mitigate the impact of natural disasters.

Previous studies on disaster preparedness behaviors, such as those conducted by Sagala, Okada, and Paton (2009) and Tekeli-Yeşil, Dedeoğlu, Tanner, Braun-Fahrlaender, and Obrist (2010), highlight the influence of personal/individual and environmental factors. This study adds to the extant literature on disaster preparedness by examining the interplay of behaviors, personal cognitions, and environmental factors in the context of disasters using the perspective of social cognitive theory.

Facilitating Factors in Disaster Preparedness

Disaster preparedness is the extent to which individuals and organizations are equipped and ready to respond to negative environmental threats (Perry & Lindell, 2003). At the individual level, it is a self-protective behavior that is a response to potential losses to life and property (Mishra & Suar, 2012). To this extent, advanced measures and plans aimed at developing capabilities are put in place to effectively respond to an emergency (Kuppuswamy, 2012). Previous studies have identified factors that facilitate disaster preparedness. These include personal/individual, institutional, community (Sagala et al., 2009), social, and environmental factors (Tekeli-Yeşil et al., 2010). Individual factors include three core belief systems–preparedness, hazard, and personal beliefs–that were found to influence preparedness behaviors (Becker, Paton, Johnston, & Ronan, 2013). In describing each of these belief systems, Becker and colleagues (2013) emphasized that hazard beliefs are equated with risk perception. The level of assumed risk affects how people think about disaster preparedness. Preparedness beliefs focus on the meaning of preparedness whereas personal beliefs describe people's understanding of the impact of disasters and ways of dealing with it. Literature likewise show that personal experience with a hazard has a positive influence on behavior (Norris, Smith, & Kaniasty, 1999).

Aside from individual factors, community experiences also influence when and how much we prepare for disasters (Sagala et al., 2009). Community members and civic agencies play significant roles in predicting intentions to prepare for hazards (Sagala et al., 2009). The

local media, community organizations, and interpersonal networks have a direct impact on the likelihood of predisaster preparedness activities (Kim & Kang, 2010). Given these findings, the study will look at the interplay of behaviors, personal cognitions, and environmental factors in the context of disasters using the social cognitive theory.

Social Cognitive Theory (SCT)

This study utilizes the social cognitive perspective that posits that a person's behavior can be explained in terms of individual and environmental factors rather than just being controlled by external stimuli or inner forces (Bandura, 1978). It assumes that factors such as a person's cognitive, affective, and physiological aspects, behavioral patterns, as well as environmental events operate as interacting determinants and influence one another (Bandura, 1999). Thus, it presents a framework that highlights the interactive dynamic relationship of personal and environmental factors, which determines an individual's behavior (Wood & Bandura, 1989).

A study that used SCT in the context of disaster preparedness showed that people's motivation to prepare for disasters is a function of the cognitive and affective reactions to a natural hazard (Lee & Lemyre, 2009). When individuals are motivated, intentions to prepare are formed on the basis of their outcome expectancies and self-efficacy. However, translating these intentions to actions depend on whether or not they transfer responsibility of preparedness to others, have a strong sense of community, trust the sources of disaster information, and perceive that the hazard occurs infrequently (Lee & Lemyre, 2009). The findings of the said study support the idea that individual and community factors contribute to an individual's intention to prepare for disasters (McIvor, Paton, & Johnston, 2009).

Individual Factors

Learning about the need and benefit of disaster preparedness comes from personal experiences (Mishra, Suar, & Paton, 2009). In countries frequently visited by disasters, such as the Philippines, the severity of previous disaster experience as well as the level of perceived

risks associated with a disaster might influence how a person prepares for disasters.

Severity of disaster experience. People who have experienced floods are believed to most likely take special measures to prepare for it (Takao et al., 2004). Previous disaster exposure is highly associated with the degree of disaster preparedness in urban places in high-income countries (Sattler, Kaiser, & Hittner, 2000). It can even be argued that preparedness for a hazard depends on the amount of damage from previous hazard experience (Takao et al., 2004).

Risk perception. Risk perception depends on how much the person perceives the disaster as a threat and their assessment of vulnerability to the impending disaster (Delfin & Gaillard, 2008). People with low-risk perceptions are more likely to poorly adjust to the threats of natural hazards while those with high-risk perceptions tend to anticipate the impact of disasters and prepare more for them (Delfin & Gaillard, 2008).

Based on the literature presented, we assume that the severity of previous disaster experience and risk perception predicts disaster preparedness behaviors.

Hypothesis 1: Risk perception and severity of disaster experience predicts disaster preparedness.

Environmental Factors

When a disaster strikes, response depends upon the preparedness of all stakeholders. Government agencies worldwide have now developed their own guidelines to better respond to disasters. In the Philippines, the National Disaster Risk Reduction and Management Council (NDRRMC; n.d.) crafted the NDRRM Plan 2011-2028. It covers the expected outcomes, outputs, key activities, indicators, lead agencies, implementing partners, and timelines for disaster prevention, mitigation, preparedness, response, rehabilitation, and recovery. As government agencies are expected to lead in disaster preparedness and mitigation, measures are put in place to better respond to emergencies from the national to the community levels. Due to these strategies, confidence in the local government units tends to increase the level of perceived preparedness (Basolo et al., 2009).

There is also a growing awareness on the role of the community in mitigating disasters. Community-based approaches are used to mobilize people and raise local concerns to political representatives (Allen, 2006). Case in point is a study conducted in a coastal community in Sri Lanka where community leaders were tapped to be part of the program. Capability building activities such as disaster awareness educational campaigns, radio talk shows, informal briefing on evacuation routes, safe zones, warning protocols, and evacuation plans were established to enhance community and individual-level preparedness (Said, Ahmadun, Mahmud, & Abas, 2011). Given these, we propose that community preparedness is an environmental factor that predicts a person's disaster response.

Hypothesis 2: Community disaster preparedness predicts disaster preparedness.

METHOD

This study used a correlational design. Specifically, data were gathered through survey from three areas in the Philippines with relatively recent experience of natural disasters. Regression analysis was used to test the hypotheses.

Participants

The participants of this study came from Tacloban City, Leyte, and Metro Manila areas that recently experienced severe flooding due to Typhoon Yolanda in 2013 and extreme monsoon rains, respectively. Quota sampling was used to generate 401 participants who came from various barangays in the identified areas. The respondents were mostly economically productive, with age range of 20-78 years old. They were predominantly female (61%) and have lived in the area for about 11-20 years.

Measures

Severity of disaster experience. To measure this variable, participants were asked if they experienced the following from a recent

disaster: perceived threat to life, injury to self/another household member, property loss, escaped being washed away, seeing nearby village being washed away, death of relative, heard of death or injury of someone in community, and house damage. Responses to the nine statements (α = .79) were either yes or no. Score was generated by counting the number of yes answers (Mishra et al., 2009).

Risk perception. This was measured using a semantic-differential scale composed of polar opposite adjectives separated by a 7-point rating scale. Questions included perceived risk for flooding *(no to high risk)*, emotions associated with risk *(calm to worry)*, likelihood that risk will affect future generations *(no to yes)*, and perception of whether risk is increasing or decreasing. The mean score was calculated and used in the analysis. The measure was found reliable (4 items; α = .75).

Community disaster preparedness. Respondents were asked to indicate their community's disaster readiness. The scale consisted of four items (α = .84) including "My community is prepared for emergency situations." Responses were measured using a 5-point Likert scale from *strongly disagree* to *strongly agree*.

Disaster preparedness behaviors. Ten items (α = .72) measured disaster preparedness behaviors. These included building an emergency kit, making a family communication plan, and securing property. Score was generated by counting the number of yes responses.

Procedure

Participants first signed an informed consent and were then asked if they opt to answer the questionnaire on their own or have the interviewers ask the questions. Most participants opted to let the interviewers ask the questions. Those that chose to answer the survey on their own were guided by the interviewers. Encoding, data cleaning, and analysis were done after data gathering.

Analysis

Data were subjected to descriptive and correlational analysis using the Statistical Package for the Social Sciences (SPSS). Standard

multiple regression analysis was performed to explore the contribution of all and each of the antecedent variables to the prediction of disaster preparedness behaviors.

RESULTS

Means, standard deviations, and correlations of the variables in the study are presented in Table 1. The results indicate that participants reported to be generally prepared for disasters (M = 8.00), have less to moderate severity of disaster experience (M = 3.86), moderately perceives risk (M = 4.86) and somewhat agrees that their communities are prepared for disasters (M = 3.43). The three identified predictor variables (severity of disaster experience, risk perception, and community disaster preparedness) were significantly correlated with the outcome variable (disaster preparedness). Among the three variables, severity of the disaster experience has the highest correlation with disaster preparedness, r = .33, p < .01. Individual factors–risk perception and severity of disaster experience–were not significantly associated with community disaster risk preparedness.

Table 1. Means, Standard Deviations, and Correlations of Variables

	M	*SD*	1	2	3	4
1. Disaster Preparedness	8.00	2.11	--			
2. Severity of Disaster Experience	3.86	2.50	.33**	--		
3. Risk Perception	4.86	1.40	.15**	.28**	--	
4. Community Disaster Preparedness	3.43	0.96	.14**	.06	-.06	--

Note. ** Correlation is significant at p < .01 level (2-tailed).

Predictors of Disaster Preparedness

Standard multiple regression analysis was used to determine the predictors of disaster preparedness. Results presented in Table 2 indicate that when taken together, the antecedents predict 12% of the variance in disaster preparedness $F(3,380) = 19.05$, $p < .05$. Severity of disaster experience had the biggest contribution (ß = .30) followed by community disaster preparedness (ß =.12) and then risk perception (ß = .10).

Table 2. Predictors of Disaster Preparedness

Independent Variables	*B*	*SE*	*t*	*p*
(Constant)	S-	.54	9.63	.00
Risk Perception	.10	.07	2.05	.04*
Severity of Disaster Experience	.30	.04	6.10	.00*
Community Disaster Preparedness	.12	.11	2.60	.01*

Note. *$p < .05$

DISCUSSION

This study looked at the individual and environmental factors that influence disaster preparedness. Findings supported our hypotheses that disaster preparedness behavior is predicted by individual (i.e., risk perception and severity of disaster experience) and environmental (i.e., community disaster preparedness) factors. Results validate the assumptions of social cognitive theory (SCT) that personal and environmental factors determine an individual's behavior (Wood & Bandura, 1989) as applied to disaster preparations. Figure 1 summarizes the findings of this study.

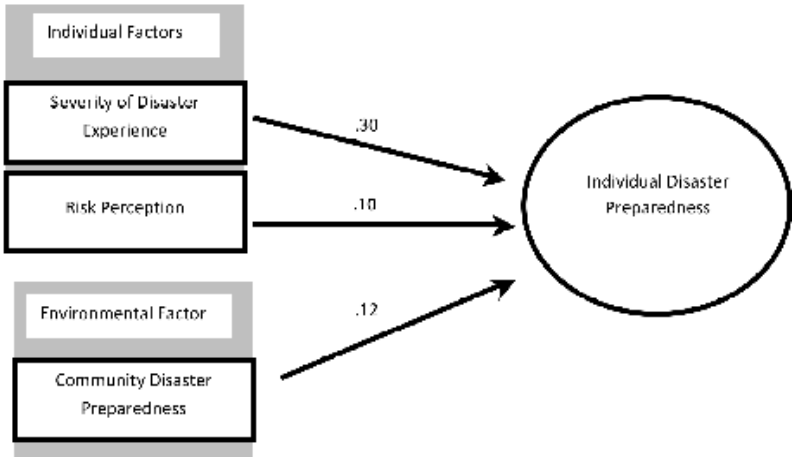

Figure 1. Individual and environmental predictors of disaster preparedness

Severity of Disaster Experience and Risk Perception

People who have experienced more losses in previous disasters seem to prepare more for disasters. This supports the findings of Takao et al. (2004) that the degree of damage sustained in previous disasters determines preparedness. This may be because the experience of personal injury or injury of family members, losing family members or relatives, and/or other material losses leaves a lasting imprint on the minds of people. These experiences seem to serve as reminders of the consequences of not being prepared for disasters. Half of the respondents of the study came from Tacloban, which was severely battered by Typhoon Yolanda. On the other hand, frequent flooding in Metro Manila due to typhoons and heavy monsoon rains may also have contributed to the losses experienced by the respondents.

Results supported the claims of Delfin and Gaillard (2008) that individuals who perceive greater risks from disasters will likely engage in anticipatory behaviors. Individuals who perceive risk to their lives and property (i.e., due to living in disaster-prone areas) seem to encourage disaster preparedness. Findings are likewise consistent with the propositions of SCT that a person's cognitive, affective, and

even physiological states or reactions influences behavioral response (Bandura, 1999; Wood & Bandura, 1989).

Community Preparedness

Consistent with the assumptions of SCT, environmental factors were found to determine disaster preparedness behaviors (Wood & Bandura, 1989). Those who agreed that their community is disaster prepared tend to also prepare more for disasters. Findings are similar to the results of the study conducted by Said et al. (2011) in Sri Lanka.

In the Philippine context, the findings may also be explained by the values and norms of *pakikisama* or good interpersonal relationships (Enriquez, 1992) and *bayanihan* or helping one another (Yacat, 2012). *Pakikisama,* in the context of disaster, may mean yielding to the community leaders and the majority to maintain smooth interpersonal relationships. If the people in the community are preparing for the impending disaster, one will prepare as well so as not to be perceived as *hindi marunong makisama* (unable to get along with others). Building on the value of *pakikisama,* one also engages in bayanihan that highlights the value of helping one another, especially those in the community where one lives (Yacat, 2012). In disaster situations, everyone must contribute to the community disaster preparedness efforts not just to save oneself but to ensure safety of everyone.

Overall, the findings highlight the usefulness of SCT in disaster preparedness research. Results show that a person's behavior can be explained by individual and environmental factors rather than just being controlled by external stimuli (Bandura, 1978). Unlike previous studies that measured motivations of people to prepare for disaster (Lee & Lemyre, 2009; McIvor et al., 2009) the current study establishes personal and environmental factors that predict actual disaster preparedness behaviors and are critical in the conduct of disaster risk reduction and management efforts.

Limitations and Implications

This study has a number of limitations. One is that the participants only came from areas that have experienced severe typhoon and

flooding. Other areas, especially those that have not experienced the extreme impact of disasters, can be identified to enable group comparisons. More variables can also be considered especially for environmental factors. Previous studies have shown the effect of media, civic organizations, and interpersonal networks. These could be considered to further explore impacts of contextual and cultural elements on disaster preparedness.

The results of the study provide insights as to how disaster preparedness can be developed and improved. The study shows that risk perception propels individuals to prepare for disasters, it can probably be used as basis in organizing information campaigns. Generally, findings of this study may orient disaster preparedness initiatives.

AUTHORS' NOTES

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