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PTSD and Depressive Symptoms in 911 Telecommunicators: The Role of Peritraumatic Distress and World Assumptions in Predicting Risk

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Continued exposure to trauma increases risk for both depression and PTSD. This may be particularly true for individuals with work-related exposure to trauma such as 911 telecommunicators, a group with significant exposure to work-related trauma that has received limited empirical attention. The present study examines current symptoms of PTSD and depression in telecommunicators and the extent to which peritraumatic distress and world assumptions interact to predict psychopathology. A sample of 171 911 telecommunicators from across the country completed a survey that assessed current symptoms of depression and PTSD, as well as exposure to different types of work-related events, peritraumatic distress, and world assumptions. Symptoms of PTSD and depression were significantly related to peritraumatic distress, self-worth, and benevolence of the world. Analyses revealed that the relationship between peritraumatic distress and both current depression and PTSD was significantly stronger for individuals who reported more negative assumptions about the benevolence of the world and self-worth. Further, positive assumptions regarding the controllability of the world were associated with PTSD, particularly in individuals who reported high peritraumatic distress. The results suggest that 911 telecommunicators experience significant work-related exposure to trauma, yet retain somewhat positive world assumptions. The important role of world assumptions in explaining the link between peritraumatic distress and posttrauma psychopathology in the form of current PTSD and depression is discussed.

Keywords: peritraumatic distress, world assumptions, PTSD, depression, emergency responders

Research has shown PTSD symptomatology to be notably high in adults with ongoing duty-related trauma exposure. For example, rates of PTSD in firefighters have been estimated to range between 12.5 and 22% (Corneil, Beaton, Murphy, Johnson, & Pike, 1999; McFarlane & Papay, 1992; Wagner, Heinrichs, & Ehlert, 1998). In police officers, rates of PTSD have been shown to range from 13–35% (Boyle, 1987; Mann & Neece, 1990; Neylan et al., 2005; Robinson, Sigman, & Wilson, 1997), with rates even higher in police officers exposed to duty-related shootings (46%; Gersons, 1989). The rate of PTSD symptoms consistent with a clinical diagnosis was 19% in police officers who worked in the aftermath of Hurricane Katrina (West et al., 2008).

Exposure to trauma also enhances risk for depressive symptoms, though research on rates of depression in individuals with exposure to duty-related trauma has remained limited. However, research has suggested that exposure to duty-related trauma increases risk for depression in police officers (Hartley, Violanti, Fekedulegn, Andrew, & Burchfiel, 2007). In a study of retired firefighters exposed to the World Trade Center disaster, 7% reported symptoms consistent with a diagnosis of Major Depression on the Center of Epidemiologic Studies Depression Scale (CES-D-m; Radloff, 1977), with an additional 36% reporting symptoms considered at "elevated risk" for Major Depression (Chiu et al., 2010).

While trauma exposure directly increases risk for PTSD and/or depression, empirical investigation in the last decade has identified intervening variables that enhance risk for adverse psychological sequelae. Emotional and cognitive factors have received significant attention, including the extent to which an individual experiences emotional distress during a traumatic event and posttrauma cognitions. For example, greater peritraumatic emotional distress has been especially implicated in risk for the development of PTSD (Brunet et al., 2001; Karam et al., 2010; Ozer, Best, Lipsey, & Weiss, 2003) and the negative self-cognitions frequently observed in depression (Miller, Handley, Markman, & Miller, 2010). The same has been found for posttrauma cognitions about the world, or world assumptions (Janoff-Bulman, 1989, 1992).

World assumption theory states that individuals typically develop in childhood the following three fundamental assumptions that aid in organizing external input: the world is benevolent (i.e., most people do not expect bad things to happen to them or others), the world is meaningful (i.e., people have control over their lives and things happen for a reason), and the self is worthy (i.e., people believe that they deserve good things to happen to them). These assumptions allow an individual to navigate their social world without anxiety that may be present if one were to believe the

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world to be essentially malevolent or uncontrollable. World assumption theory has much in common with other cognitive and psychological theories that have been linked to the development of psychopathology, such as the Hopelessness Theory of depression, which contends that depression forms out of the tendency of an individual to make cognitive attributions that are internal, global, and stable (Abramson et al., 2002; Abramson, Metalsky, & Alloy, 1989). The world assumptions construct may also overlap with the internal working model of attachment theory (Bowlby, 1969/1982). This theory emphasizes how a healthy infant–caregiver relationship produces within developing children an ability to not only regulate emotions, but also a cognitive attributional style that sees the world as benevolent and safe to explore, and both instills and maintains a healthy sense of self-worth in the individual.

The theory of world assumptions argues that assumptions are malleable and can be shattered in the face of a traumatic experience. In fact, a significant link has been found between trauma exposure, mental health, and world assumptions. For example, more diminished world assumptions was associated with PTSD in South African trauma survivors (Magwaza, 1999), in a community sample of trauma survivors (Goldenberg & Matheson, 2005), and in survivors of intimate partner violence (Lilly, Howell, & Graham-Bermann, in press). More negative world assumptions in the presence of depressive symptoms have also been observed in undergraduate students (Harris & Valentiner, 2002) and intimate partner violence survivors (Lilly, Valdez, & Graham-Bermann, 2011). Yet, limited empirical work has examined world assumptions in first responders. Wagner, McFee, and Martin (2009) found that the world assumptions of firefighters were no more negative than a control group of blue-collar workers who did not regularly experience job-related trauma exposure, with the exception of the benevolence of the world subscale. The authors argued this may be due to the fact that firefighters reported more overall job satisfaction because they find their work meaningful in its contribution to the community. Harris, Baloglu, and Stacks (2002) used structural equation modeling to show that critical incident debriefing was positively, though weakly, associated with better world assumptions in firefighters exposed to duty-related trauma, and that debriefing was significantly, inversely related to negative affectivity as measured by depressive and anxiety symptoms. This might suggest that debriefing may be related to the restoration of more positive assumptions in the aftermath of duty-related trauma for firefighters, and that this may be related to lowered risk for posttrauma depression and anxiety.

In police officers, world assumptions have been linked to lowered risk for PTSD. Yuan et al. (2011), for example, conducted a 2-year prospective study, in which cognitions of police academy cadets related to self-worth and benevolence of the world were assessed. The authors found that having more positive assumptions regarding the benevolence of the world seemed a protective factor against developing duty-related PTSD 2 years after the completion of training. This study suggests that beliefs in the benevolence of the world may be a particularly important cognitive factor that assists individuals in creating meaning around, and recovering from, traumatic events experienced while on duty in ways that protect against the development of PTSD. Further, Wang et al. (2010) found that cognitions related to self-worth were important in predicting 2-year prospective depression symptoms in police officers. Given the centrality of self-worth in conceptualizations of depression, this finding is not surprising. In sum, it appears as though particular constructs within the world assumptions theory may be more specifically related to posttrauma psychopathology in samples of first responders. Benevolence of the world, for instance, has been more strongly associated with PTSD in both firefighters and police officers, while self-worth has been more strongly associated with posttrauma depression scores. The world assumptions of 911 telecommunicators, however, have never been examined, nor has an exploration of the relationship between world assumptions and psychopathology been conducted in this population.

Finally, while world assumptions and peritraumatic distress have both been shown to increase risk for depression and PTSD independently, the ways in which these factors interact has not been explored and may provide some theoretical support for Janoff-Bulman's original theory. Janoff-Bulman contends that assumptions are typically positive until confronted by highly contradictory information that is presented in a context of high emotional distress. Yet, no research to date has explored whether there is (a) a relationship between level of peritraumatic distress and more diminished world assumptions, and (b) whether these factors interact in ways that significantly predict posttrauma symptom picture. One might theorize that peritraumatic distress will be most deleterious for individuals that report more negative world assumptions in the aftermath of trauma.

This study examines current symptoms of PTSD and depression in a sample of 911 telecommunicators. We wished to examine whether heightened reports of work-related peritraumatic distress were related to more diminished world assumptions and whether these factors interact to predict depression and PTSD symptoms. The following hypotheses were proposed: (1) peritraumatic distress will be significantly, positively correlated with both current PTSD and depressive symptoms, (2) assumptions regarding self-worth, controllability and benevolence of the world will be inversely related to PTSD and depressive symptoms, (3) greater levels of peritraumatic distress will be related to more diminished assumptions of self-worth, controllability and benevolence of the world, and (4) world assumptions will significantly moderate the relationship between peritraumatic distress and both current PTSD and depressive symptoms. We contend that peritraumatic distress will be more significantly, positively correlated to PTSD and depressive symptoms for individuals twho report more negative world assumptions.

Method

Participants

A total of 171 911 telecommunicators across the United States completed the survey. The sample was predominantly female (n = 126, 74%) and European American (n = 131, 77%) with an average age of 38.85 (SD = 9.61). Most of the participants were married and/or living with a partner (n = 107, 63%), however, a significant minority reported being single (n = 30, 18%) or divorced (n = 31, 18%). All participants were currently working as a telecommunicator with an average of 11.85 (SD = 8.16) years of service. Most participants had either a college degree (n = 58, 34%) or some college or vocational training (n = 80, 47%).

Measures

PTSD symptoms. The Posttraumatic Stress Diagnostic Scale (PDS; Foa, 1995) was used to assess severity of PTSD symptoms in the last month. The PDS is a 49-item measure that asks participants to identify a traumatic life event that they experienced as "the worst" or one that "stuck with them." Participants were asked to focus on an upsetting event that occurred while on duty. With a focus on this event, participants were asked whether they had experienced symptoms of hyperarousal, reexperiencing, and avoidance symptoms in the last month in relationship to the event, with response options of 0 = *Not at all or only one time*, 1 = *Once a week or less/once in awhile*, 2 = *2–4 times a week/half the time*, and 3 = *5 or more times a week/almost always*. A symptom score was created by tallying symptom items, with higher scores indicating more severe PTSD symptoms. The internal consistency of the PDS for the present sample was $\alpha = .92$.

Depressive symptoms. The Depression subscale of the Symptom Checklist-90-R (SCL-90–R; Derogatis, 1994) was used. Participants are asked to consider whether they have been affected by measure items in the past week with response options of 0 = *Not at all*, 1 = *A little bit*, 2 = *Moderately*, 3 = *Quite a bit*, and 4 = *Extremely*. The Depression subscale includes 13 items and scores are generated by averaging item responses. Higher scores represent more disturbances related to depressive symptoms. The internal consistency for the Depression subscale in this sample was $\alpha = .91$.

Peritraumatic distress. The Peritraumatic Distress Inventory (PDI; Brunet et al., 2001) was used to assess emotional distress during and immediately after the participants' most upsetting experience at work. The PDI is a 13-item measure with response options of 0 = *Not at all*, 1 = *Slightly*, 2 = *Somewhat*, 3 = *Very*, and 4 = *Extremely true*. The PDI score was created by tallying all 13 items, with higher scores reflecting the presence of greater peritraumatic emotional distress. Internal consistency for the PDI was $\alpha = .86$.

World assumptions. The World Assumptions Scale (WAS; Janoff-Bulman, 1989) is a 32-item measure that assesses participants' cognitions about the world and self. A 6-point scale is used with response options of 1 = *Strongly disagree*, 2 = *Disagree*, 3 = *Somewhat disagree*, 4 = *Somewhat agree*, 5 = *Agree*, and 6 = *Strongly agree*. The original measure contains eight subscales, but for the present study, only the self-worth (WAS–SW), benevolence of the world (WAS–BW) and controllability (WAS–CONT) subscales were used. Each of these subscales includes four items. Examples include: "The good things that happen in this world far outnumber the bad" (benevolence of the world), "People's misfortunes result from mistakes they have made" (controllability), and "I often think I am no good at all" (self-worth). The subscale scores were produced by reverse coding specified items and tallying items on the subscale, with higher scores reflecting more positive assumptions. The internal consistency for the subscale scores were: benevolence of the world $\alpha = .86$, self-worth $\alpha = .77$, controllability $\alpha = .77$.

Exposure to distressing calls. To assess participants' exposure to different types of work-related calls, the Potentially Traumatic Events Questionnaire (Troxell, 2008) was used. The questionnaire assesses whether participants have experienced 21 different types of traumatic calls that telecommunicators may field. These events range from violent domestic calls to traffic accidents with fatalities to calls involving family or friends. To our knowledge, this is only the second time that this questionnaire has been used. As such, the psychometric properties of the measure have not been fully investigated.

Procedure

Participants were approached to participate in the survey through a number of sources: recruitment letters at randomly selected agencies, professional association list serves, professional organization online forums, and social networking interest groups discussion boards. The option to complete the survey online or via hard copies was presented. No financial incentive was offered. The study was approved by the institutional review board (IRB) at Northern Illinois University.

Results

The sample reported exposure to an average of 15.32 different types of potentially traumatizing calls ($SD = 3.50$). For most calls, over 75% of the sample reported exposure to that type of call, including calls such as structure fires, violent domestics, and armed robbery. However, several types of calls produced more equal distribution (i.e., calls involving friends or family; 55%) or were comparatively underreported by the sample: riots/mob action (38.6%), hostage situation (43.9%), plane crash (34.5%), officer shot (31.6%), and line-of-duty death (32.3%). Despite a high rate of exposure to potentially traumatizing duty-related events, current PTSD symptom reports in the last month were surprisingly low ($M = 7.07$, $SD = 8.13$). The mean score for depression symptoms was .65 ($SD = .68$). The depression score for females and males in the sample were at the 58th and 61st percentile, respectively, for female and male nonpatient samples (Derogatis, 1994).

A correlation matrix examining the primary variables of interest confirm the first hypothesis; namely, peritraumatic distress was significantly, positively related to both PTSD symptoms ($r = .34$, $p < .001$) and depressive symptoms ($r = .36$, $p < .001$) (see Table 1). The second hypothesis was also partially confirmed as current PTSD symptoms were significantly, inversely related to self-worth ($r = -.16$, $p = .042$) and benevolence of the world ($r = -.22$, $p = .004$), and similarly, depressive symptoms were significantly, inversely related to self-worth ($r = -.20$, $p = .011$) and benevolence of the world ($r = -.19$, $p = .012$). Controllability was not significantly related to current PTSD ($r = .07$, $p = .399$) or depressive symptoms ($r = .09$, $p = .233$). Hypothesis three was

Table 1
*Correlation Matrix of Primary Variables of Interest (*N = *171)*

	1	2	3	4	5	6
1. WAS Self-worth	—					
2. WAS Controllability	−.07	—				
3. WAS Benevolence of World	.19*	−.03	—			
4. Peritraumatic Distress	.21**	−.13	.02	—		
5. PTSD Symptoms	−.16*	.07	−.22**	.34***	—	
6. Depressive symptoms	−.20*	.09	−.19*	.36***	.65***	—

* $p < .05$. ** $p < .01$. *** $p < .001$.

also only partially confirmed as peritraumatic distress was significantly related to self-worth ($r = .21$, $p = .006$), but was not significantly associated with controllability ($r = -.13$, $p = .089$) or benevolence of the world ($r = .02$, $p = .773$).

A series of moderation analyses were conducted to examine whether world assumption variables interacted with peritraumatic distress to predict posttrauma psychopathology. The methodology for testing moderation prescribed by Frazier, Tix, and Barron (2004) was used. World assumptions and peritraumatic distress were standardized to reduce multicollinearity. The first set of regression analyses examined benevolence of the world as a moderator of the relationship between peritraumatic distress, and both current PTSD and depressive symptoms (see Table 2). For both outcome variables, the analyses showed main effects for greater peritraumatic distress and more negative benevolence of the world, with each uniquely predicting variance in PTSD and depressive symptoms. Benevolence of the world also served as a significant moderator of the relationship between peritraumatic distress and both current PTSD (see Figure 1) and depressive symptoms (see Figure 2). More specifically, peritraumatic distress conferred the greatest risk for posttrauma psychopathology when individuals reported beliefs that the world is unsafe and malevolent.

Similar analyses were completed substituting self-worth as the moderator (see Table 3). Significant main effects were observed such that greater peritraumatic distress and lower self-worth accounted for unique variance in current PTSD and depressive symptoms. A significant moderating effect was observed for depressive symptoms; peritraumatic distress was more strongly associated with depressive symptoms in the presence of more diminished self-worth (see Figure 3). While reports of current PTSD symptoms were greatest for individuals high on peritraumatic distress with more negative self-worth, the interaction term was not significant ($p = .068$).

The final regression analysis was performed testing controllability as the moderating variable (see Table 4). The analyses revealed that peritraumatic distress continues to have a significant, positive association with psychopathology in the presence of controllability. No main effect was observed for controllability, though controllability it is important to note that controllability showed a positive relationship with current PTSD symptoms and depressive symptoms. Further, greater peritraumatic distress conferred significantly greater risk for current PTSD symptoms for individuals that had more positive assumptions about the controllability of the world, not more negative assumptions (see Figure 4). While the direction of moderating effect was the same for depression, the interaction term was not significant ($p = .093$).

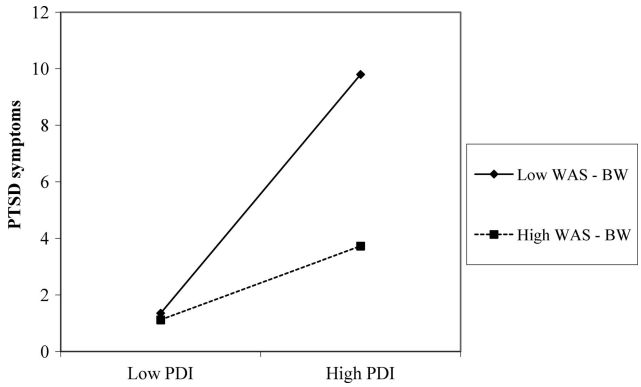

Figure 1. Benevolence of the world as a moderator of the relationship between peritraumatic distress and PTSD symptoms.

Discussion

This study is the first to examine depression and PTSD symptoms in 911 telecommunicators, a population at great risk for adverse mental health given high levels of duty-related trauma exposure. We sought to examine the influence of peritraumatic distress on current depression and PTSD symptoms, as well as to determine whether distress is moderated by the extent to which world assumptions are diminished in the face of trauma exposure. While research has consistently shown relationships between peritraumatic distress and posttrauma psychopathology (Brunet et al., 2001; Karam et al., 2010; Miller et al., 2010; Ozer et al., 2003), as well as links between diminished world assumptions and both PTSD and depression symptoms (Goldenberg & Matheson, 2005; Harris & Valentiner, 2002; Lilly, Howell, & Graham-Bermann, in press; Lilly, Valdez, & Graham-Bermann, 2011; Magwaza, 1999), the present study wished to provide some preliminary support to world assumption theory, which argues that assumptions are shattered during traumatic events that are extremely emotionally distressing. Though a cross-sectional design cannot fully answer this question, it is one step in examining whether world assumptions

Table 2
WAS Benevolence of the World as a Moderator of the Relationship Between Peritraumatic Distress (PDI) and Both PTSD Symptoms and Depressive Symptoms

Dependent variable	Predictors	Adj. R^2	β	*SE* β	*p*
PTSD Symptoms		.19			
	PDI		2.76	.56	.000***
	WAS–BW		−1.58	.57	.007**
	PDI × WAS–BW		−1.46	.56	.010*
Depressive Symptoms		.20			
	PDI		.25	.05	<.001***
	WAS–BW		−.11	.05	.021*
	PDI × WAS–BW		−.13	.05	.007**

* $p < .05$. ** $p < .01$. *** $p < .001$.

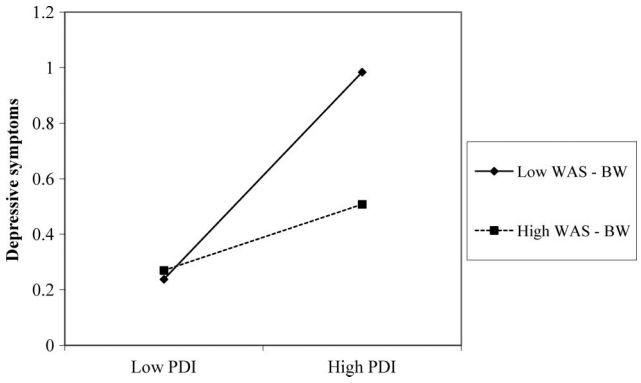

Figure 2. Benevolence of the world as a moderator of the relationship between peritraumatic distress and depressive symptoms.

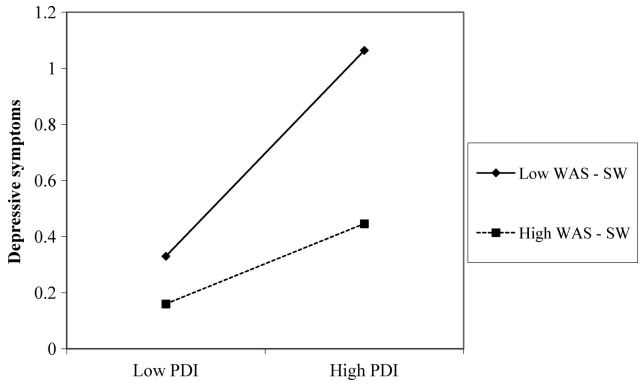

Figure 3. Self-worth as a moderator of the relationship between peritraumatic distress and depressive symptoms.

are connected to peritraumatic experiences, and can help explain why peritraumatic distress has been so strongly linked to the development of depression and PTSD symptoms.

Consistent with predictions, an interaction effect was observed between peritraumatic distress and benevolence of the world in predicting both current depression and PTSD symptoms. More diminished assumptions about the benevolence of the world accentuated the effect of peritraumatic distress on both depression and PTSD symptoms. Similar effects were detected when considering self-worth as a moderator in the relationship between peritraumatic distress and psychopathology such that individuals at greatest risk for depression symptoms were those that reported both heightened levels of distress and concurrently more diminished self-worth. Given that self-worth is not a required criterion for diagnosis of PTSD, but is for depression, it perhaps makes sense that self-worth would be more strongly implicated in depression than PTSD. This is also consistent with previous work with firefighters and police officers, which showed that self-worth was implicated in depression, but not PTSD (Wagner et al., 2009; Wang et al., 2010).

These results provide some preliminary support for the important role of both peritraumatic distress and world assumptions in predicting posttrauma psychopathology, which may provide important information relevant for training and preventing psychopathology in telecommunicators. Specifically, strong emotional reactions at the time of an upsetting duty-related event should be targeted for prevention of psychopathology, and further, an emphasis should also be placed on the extent to which individuals retain more positive cognitions about the benevolence of the world and self-worth. This study suggests that individuals whose assumptions are less strongly diminished in the presence of trauma fare better, even if they have experienced significant distress during duty-related events.

The final moderation analyses produced unanticipated results. Though it was hypothesized that having more diminished controllability would be related to heightened risk for current depression and PTSD symptoms, and further, that negative controllability would moderate the relationship between distress and psychopathology, the observed direction of effect was the opposite to that anticipated. A significant interaction was observed between controllability and peritraumatic distress in predicting PTSD, such that having more positive assumptions about one's control over the world accentuated the relationship between distress and PTSD symptoms. A similar effect was also observed for depression, though the interaction term achieved only the level of a trend. One possibility for these seemingly countertheoretical findings is that controllability serves a particular occupational role for telecommunicators. The job of a telecommunicator involves trying to gather information from callers that are often hysterical and lack control. If the telecommunicator is unable to sufficiently pacify a caller to a point where the caller can communicate important information, the telecommunicator will be ineffective. As such,

Table 3
WAS Self-Worth (WAS–SW) as a Moderator of the Relationship Between Peritraumatic Distress (PDI) and Both PTSD Symptoms and Depressive Symptoms

Dependent variable	Predictors	Adj. R^2	β	*SE* β	*p*
PTSD Symptoms		.18			
	PDI		2.89	.60	.000***
	WAS–SW		−1.96	.58	.001**
	PDI × WAS–SW		−.95	.52	.068
Depressive Symptoms		.24			
	PDI		.26	.05	.000***
	WAS–SW		−.20	.05	.000***
	PDI × WAS–SW		−.11	.04	.008**

* $p < .05$. ** $p < .01$. *** $p < .001$.

Table 4
WAS Controllability (WAS–CONT) as a Moderator of the Relationship Between Peritraumatic Distress (PDI) and Both PTSD Symptoms and Depressive Symptoms

Dependent variable	Predictors	Adj. R^2	β	*SE* β	*p*
PTSD Symptoms		.15			
	PDI		2.80	.59	.000***
	WAS–CONT		.83	.59	.160
	PDI × WAS–CONT		1.37	.62	.028*
Depressive Symptoms		.16			
	PDI		.25	.05	.000***
	WAS–CONT		.09	.05	.063
	PDI × WAS–CONT		.09	.05	.093

* $p < .05$. ** $p < .01$. *** $p < .001$.

telecommunicators may begin to believe that they possess greater control over sometimes horrific circumstances than they actually possess. No telecommunicator can completely control what occurs during a call and it may be that significant peritraumatic distress is experienced in reaction to calls over which the telecommunicator attempted to garner control, but was unable. This may significantly enhance risk for depression and PTSD as the telecommunicator may feel responsible for how events unfolded or may ruminate over what they could have done differently. These results suggest that prevention and intervention efforts may be focused on cognitions regarding control, especially in regards to PTSD. Further, world assumptions theory needs continued empirical examination and may be more nuanced in predicting mental health depending on the context of the trauma and level of distress experienced.

Strengths of the present study include its emphasis on the mental health of a population that has received strikingly limited empirical investigation despite significant exposure to potentially traumatizing events. Limited information is known about the risk for depression and PTSD among this population and further data that may inform training and prevention efforts. The cross-sectional design places some limitations on the conclusions that can be drawn regarding the proposed temporal order of effects and future research incorporating prospective designs is necessary. Because of this limitation, it is not possible to know whether the telecommunicators' current symptomatology has increased, decreased, or remained stable over time. It is possible that the cross-section of scores for this sample represent PTSD and depression that may have significantly remitted over time, and may have been worse directly following exposure to upsetting calls. Continued research to parse out the complex interrelationships between emotions and cognitions in predicting posttrauma symptom picture is warranted.

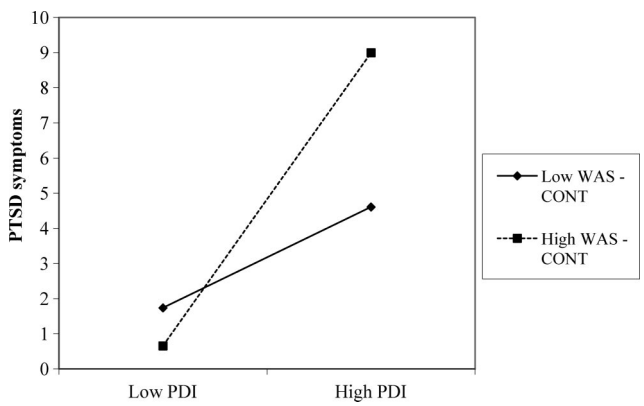

Figure 4. Controllability as a moderator of the relationship between peritraumatic distress and PTSD symptoms.

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