Predictors of the Development of Posttraumatic Stress Disorder Among Police Officers

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This retrospective study examined risk and protective factors for the development of posttraumatic stress disorder (PTSD) in a sample of 132 Canadian police officers. Structured interviews were conducted in order to assess the most distressing work-related traumatic events and determine diagnoses of full or partial PTSD. Participants completed self-administered questionnaires assessing several potential predictors. The results suggested that 7.6% of the participants developed full PTSD, whereas 6.8% had partial PTSD following an incident at work. A multiple logistic regression analysis indicated that the most potent risk factor for the development of full or partial PTSD was peritraumatic dissociation. Social support from colleagues during the event emerged as a significant protective factor. Clinical implications of the findings are discussed.

KEYWORDS posttraumatic stress disorder (PTSD), police, predictors, predictive factors, risk factors, protective factors

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Police officers encounter frequent and repetitive exposure to highly stressful events that can be life threatening or that can pose a threat to their physical integrity. These potentially traumatic work experiences can have considerable repercussions on the psychosocial and occupational functioning of police officers and can even lead to the development of posttraumatic stress disorder (PTSD; McNally & Solomon, 1999).

Exposure to a traumatic event is a necessary but insufficient condition for the development of PTSD. In fact, the return to baseline functioning after a traumatic event often depends on the presence or absence of various factors that modulate posttrauma reactions. Risk factors are associated with the development, maintenance, or exacerbation of posttraumatic symptomatology, whereas protective factors facilitate adaptation following a trauma and are associated with the prevention of PTSD reactions or a decrease in PTSD symptomatology (King, Vogt, & King, 2004). A better knowledge of the predictive factors of posttraumatic symptomatology will enable practitioners to carry out prevention and intervention more effectively. Predictive factors can be classified into three distinct categories: pretraumatic (attributes that existed prior to the trauma), peritraumatic (features present at the time of trauma and shortly thereafter), and posttraumatic (characteristics occurring after the trauma). So far, various authors (see, e.g., King et al., 2004) have used this classification in their work, which is useful for making comparisons of sets of predictors across studies. Furthermore, this grouping enables researchers to determine, based on temporal proximity to the trauma, which factors have the greatest impact on PTSD.

**PREDICTORS OF PTSD IN POLICE OFFICERS**

**Pretraumatic Factors**

The development of PTSD symptoms in police personnel is associated with cumulative exposure to duty-related critical incidents and occupational stressors (Friedman & Higson-Smith, 2003; Liberman et al., 2002). Prior experience and adequate training were found to be protective factors for PTSD development in some studies of police officers (Dyregrov, Kristoffersen, & Gjestad, 1996; Perrin et al., 2007) but not in others (Alexander & Wells, 1991; Carlier, Lamberts, & Gersons, 1997). In contrast to previous research on civilians, studies of police officers have found no relationship between prior adverse life events, previous individual or familial psychiatric problems, and PTSD (Carlier et al., 1997; Hodgins, Creamer, & Bell, 2001). In the literature, demographics have sometimes been related to PTSD, but many studies of police officers have failed to find a relationship between marital status, gender, age, rank, education, and PTSD (Carlier et al., 1997; McCaslin et al., 2006; Pole, Best, Metzler, & Marmar, 2005; Wilson, Poole, & Trew, 1997). In sum, results about pretraumatic factors are not always consistent. This can
be explained in part by differences in study design, samples, or instruments used; by the presence of concomitant or confounding variables, especially for demographics; and by the presence of moderator and mediating effects. Moreover, predictors may operate differently for different trauma populations (Brewin, Andrews, & Valentine, 2000).

Peritraumatic Factors

Dissociation and peritraumatic distress (i.e., emotional and physiological responses) are related to PTSD in police officers (Hodgins et al., 2001; Marmar et al., 2006; McCaslin et al., 2006; Pole et al., 2005). Dissociative reactions at the time of trauma include a sense of emotional numbing, a reduction in awareness of one's surroundings, derealization, depersonalization, and memory impairment (Bryant, 2007). Variables indicating the severity of the traumatic event, such as exposure to death and the degree of incident exposure, are risk factors for PTSD symptoms (Carlier et al., 1997; Hodgins et al., 2001).

Posttraumatic Factors

Engaging in avoidance or passive coping strategies after the trauma is related to elevated PTSD symptomatology in police officers (Haisch & Meyers, 2004; Pole et al., 2005). Dissatisfaction with organizational support following the traumatic event and lack of social support outside of police work appear to be posttraumatic risk factors (Carlier et al., 1997). In addition, officers who reported greater satisfaction with support (Wilson et al., 1997), greater perceived availability of social support (Friedman & Higson-Smith, 2003; McCaslin et al., 2006; Pole et al., 2005), and greater emotional support from peers and supervisors (Stephens, 1997) had fewer PTSD symptoms.

PREDICTORS IN OTHER POPULATIONS

Two recent meta-analyses (Brewin et al., 2000; Ozer, Best, Lipsey, & Weiss, 2003) of predictive factors for PTSD in military and civilian populations displayed results comparable to those obtained in police populations. According to these meta-analyses, peritraumatic factors (i.e., trauma severity or perceived life threat during the trauma, emotional and dissociative reactions) and posttraumatic factors (i.e., perception of positive social support, lack of social support, additional life stress) were stronger predictors of PTSD than were pretraumatic factors. A more recent meta-analysis including 35 empirical studies confirmed that peritraumatic dissociation is a risk factor for PTSD (Breh & Seidler, 2007). Other predictors have also been found. M. Martin, Germain, and Marchand (2006) offered a comprehensive review of predictors.
Previous studies on predictors of PTSD among police officers have had several methodological limitations. To the best of our knowledge, Canadian police officers are a relatively understudied population, and there are no studies on predictors of PTSD among this population. The literature is also scarce regarding protective factors that promote recovery in police personnel after duty-related traumatic events. Apart from social support, few protective factors have been measured in police populations. Furthermore, some studies of police officers have used self-report questionnaires or instruments with limited psychometric properties. Others have measured symptomatology and reactions following critical incidents without looking specifically at posttraumatic stress symptoms and PTSD diagnosis. There are also studies that have looked at associations between various variables and PTSD only through correlations. However, these analyses do not help identify the marginal contributions of putative predictors of PTSD, nor do they inform about any causal mechanisms. All of these limitations narrow down the possible conclusions and render comparisons between studies difficult.

This study attempted to overcome some of the limitations of the previous research by using valid measures to assess PTSD and predictive factors. It also investigated French Canadian police officers, a culturally different sample and a new population in the literature on predictors of PTSD. Based on earlier research findings, we hypothesized that (a) peritraumatic and posttraumatic factors would be better predictors than pretraumatic factors of the development of PTSD; (b) peritraumatic dissociation, trauma severity, and perception of negative responses from significant others would be the most robust risk factors; and (c) perception of positive social support, whether at the peritraumatic or posttraumatic level, would be a protective factor. Prior work experience, adaptive coping strategies, and personality hardiness were examined as hypothetical protective factors.

METHOD

Participants

A total of 169 French-speaking police officers from the Montreal metropolitan area were interviewed on a voluntary basis. Of these, 142 officers were included in the study because they had previously been exposed to at least one duty-related traumatic event as defined by criteria A(1) and A(2) for PTSD in the Diagnostic and Statistical Manual of Mental Disorders (4th ed. [DSM-IV]; American Psychiatric Association, 1994). When participants reported several traumatic events, the interview focused on the most stressful event. Other inclusion criteria were speaking and reading French and being sufficiently psychologically and physically fit to participate in an interview and answer several questionnaires. Exclusion criteria were being in a
psychotic state, having suicidal ideation, as well as presenting any severe mental disorder that, in the interviewer’s judgment, might interfere with the participant’s well-being. However, none of the interviewees were excluded from the study.

A two-phase data collection strategy was employed. First, participants were evaluated in a single interview. Second, they had to complete questionnaires at home and return them by mail. Among the 142 participants included, 10 (7%) did not complete the study. One of them dropped out after the interview. The remainder did not return their questionnaires by mail. The reasons for their noncompletion of the study are unknown. These participants are referred to as noncompleters. Completers of the two-phase process of the study were 132 participants (113 men and 19 women) with a mean age of 43 years (SD = 11.53) and an average of 15 years of education (SD = 2.13); 87% were married or cohabiting. Finally, 71% were active police officers, whereas 29% were retired.

There were no significant differences between completers and non-completers in terms of number of PTSD symptoms, number of avoidance symptoms, PTSD diagnosis (full or partial), PTSD severity, number of current and lifetime psychiatric disorders, or demographics (e.g., age at interview and at the time of trauma, gender, education, work, marital status).

Procedure

Recruitment involved contacting police officers from lists obtained through the Montreal Police Department of Human Resources. The research team randomly selected a total of 1,664 police officers among the 8,000 active and retired employees. Arbitrarily chosen officers received a letter at home briefly explaining the study and inviting them to participate. Officers who contacted the research coordinator were given details about the study, and, if they were still interested, an appointment for an interview was scheduled. It is noteworthy that the response rate was low, with 169 (10%) police officers recruited. One must remain careful when interpreting the following data because participation was low. Prior to the beginning of the interview, the study’s procedures were explained to officers with an emphasis on confidentiality. To ensure confidentiality, research personnel attributed a numeric code to each participant in place of his or her name. Interviews and questionnaires were kept in a secure and locked file drawer accessible only to the research personnel. Participants provided written informed consent. This study was approved by the research ethics committee of the Université du Québec à Montréal.

Measures

The French versions of the following instruments were used.
**Diagnosis of PTSD.** The PTSD module of the Structured Clinical Interview for DSM-IV Axis I Disorders (SCID-I; First, Spitzer, Gibbon, & Williams, 1996) was used to assess the diagnosis of PTSD with reference to the most stressful duty-related traumatic event. Qualified interviewers administered the whole PTSD module. A diagnosis of partial PTSD was assigned when a participant did not have enough symptoms to qualify for full PTSD but had at least one DSM-IV (American Psychiatric Association, 1994) PTSD criteria B, C, and D symptom or at least one criterion B and two criterion D symptoms (Schnurr, Lunney, & Sengupta, 2004). The PTSD module of the SCID-I is both clinically sensitive and reliable (Keane & Barlow, 2002). Furthermore, the SCID-I is the most commonly used interview to assess Axis I psychiatric disorders (Keane & Barlow, 2002). Reliability studies have indicated that the SCID-I has good to superb interrater reliability for establishing current disorders and moderate test–retest reliability for lifetime disorders (Rogers, 2001). Blind evaluations performed by independent raters consisted of rating 30% \((n = 40)\) of randomly selected audiotaped SCID-I interviews. There was perfect interrater agreement \((kappa = 1)\) on diagnoses of PTSD.

**Demographics.** Demographic data collected included gender, age, education attained, marital status, and length of police service.

**Pretraumatic factors.** The Life Events Checklist, which is part of the Clinician-Administered PTSD Scale (Blake et al., 1995), was used to investigate childhood and adulthood traumatic experiences that had happened before the traumatic event at work. This checklist comprises 16 incidents plus one open-ended item for events not listed. Respondents had to indicate if, outside of police work, they had experienced each event, if they had witnessed it, or if neither was applicable. They were also asked how the incident affected them, which enabled us to distinguish a stressful event (i.e., an event that fit diagnostic criterion A[1] of PTSD in DSM-IV) from a traumatic experience (i.e., an event that met both diagnostic criteria A[1] and A[2] of PTSD in DSM-IV). The Life Events Checklist exhibited adequate temporal stability; exhibited good convergence with a measure of trauma history, the Traumatic Life Events Questionnaire (Kubany et al., 2000); and was significantly correlated with psychological distress and PTSD symptoms (Gray, Litz, Hsu, & Lombardo, 2004).

In the study, when a participant reported previous traumatic experiences off duty on the Life Events Checklist, the whole PTSD module on the SCID-I was readministered with reference to the worst traumatic event. This enabled us to determine a history of previous PTSD. The SCID-I modules of anxiety disorders, substance-related disorders, and major depressive disorder were used to verify the existence of psychiatric disorders that predated the trauma. Blind evaluations were performed on 30% of randomly selected audiotaped SCID-I interviews. There was a very high level of interrater agreement on the presence or absence of these psychiatric disorders \((kappa = .90)\).
Familial psychiatric history was assessed with one question worded as follows: “Have any of your family members ever had psychological problems?” If applicable, respondents had to indicate their relationship to this person and the kind of problems the person had had. Furthermore, respondents were asked to indicate their age at the time of the trauma. Finally, prior work experience was evaluated as the number of years in the police force at the time of the trauma.

The World Assumptions Scale (Janoff-Bulman, 1992) is a 32-item self-report questionnaire that measures beliefs in the benevolence and meaningfulness of the world, as well as self-worth. The World Assumptions Scale has shown adequate psychometric properties, with estimates of reliability for each subscale ranging from .48 to .82 (Elklit, Shevlin, Solomon, & Dekel, 2007). The World Assumptions Scale–French Version has demonstrated good psychometric properties (Brillon, Marchand, & Prince, 2000).

The French version (Dufour-Pineault, 1997) of the Short Hardiness Scale (Bartone, 1995) is a 15-item self-report questionnaire that assesses three dimensions of personality hardiness: control, challenge, and commitment. Bartone (1999) reported acceptable internal consistency for the commitment, control, and challenge subscales (αs = .77, .68, and .69, respectively). Internal consistency for each subscale in the French version ranged from .48 to .69 (Dufour-Pineault, 1997). Cronbach’s alpha coefficient for the total measure was .82 for the original version and .66 for the French version. Test–retest reliability indicated correlations of .78 and .71 for the original and French versions, respectively.

The Coping Inventory for Stressful Situations (Endler & Parker, 1990) focuses on ways in which people react to various difficult, stressful, or upsetting situations. This inventory assesses task-, emotion-, and avoidance-oriented components of coping. The Coping Inventory for Stressful Situations has shown appropriate construct validity, and several validation samples have identified very good psychometric properties for this instrument (Schwarzer & Schwarzer, 1996). The Coping Inventory for Stressful Situations–French Version has shown good internal validity (Rolland, 1994). Internal consistency, as calculated by coefficient alpha, was .86 for the emotion-oriented subscale, .87 for the task-oriented subscale, and .83 for the avoidance-oriented subscale.

Peritraumatic factors. Trauma severity was assessed using a questionnaire constructed by the research team. It measured a total of 13 objective and subjective dimensions of the traumatic event, such as the presence of physical and verbal aggression, the unforeseeable or uncontrollable nature of the event, the perception of a threat to the person’s life or physical integrity, physical injury sustained, and contact with injured or deceased persons. Points were attributed for each characteristic endorsed. Higher total scores indicated greater trauma severity.
Peritraumatic dissociation was measured using the Peritraumatic Dissociative Experiences Questionnaire–Self-Report Version (PDEQ-SRV; Marmar, Weiss, & Metzler, 1997). The PDEQ has shown high internal consistency reliability ($\alpha = .80$) and good convergent and divergent validity (Marmar et al., 1997). The PDEQ–French Version was validated among French-speaking trauma victims (Birmes et al., 2005). It showed satisfactory test–retest reliability and internal consistency. Significant correlations between the PDEQ and PTSD symptoms indicated moderate to strong convergent validity (Birmes et al., 2005).

Peritraumatic emotional and physical reactions were assessed using the two scales of the Potential Stressful Events Interview (Kilpatrick, Resnick, & Freedy, 1991). The Initial Subjective Reaction emotional scale of the Potential Stressful Events Interview assessed 15 emotional responses, whereas the Initial Subjective Reaction physical scale assessed 10 physical symptoms common during a panic attack. Because of significant item overlap and association between the five items of the dissociation/numbing subscale of the Initial Subjective Reaction emotional scale and the PDEQ, the dissociation/numbing subscale was excluded from the computation of the total score. The revised total score was computed by totaling the remaining 10 items (Bernat, Ronfeldt, Calhoun, & Arias, 1998). Internal consistency for the revised emotional scale is .70 and for the physical scale is .86 (Bernat et al., 1998).

Two questions were developed by the research team to assess the perception of positive social support received from colleagues and the officers’ superior during or immediately after the traumatic event. The question read as follows: “In your opinion, did your partner or colleagues support you adequately during the event?” The same wording was used to measure support from the superior. Each question was answered using a 5-point Likert scale (1 = not at all, 5 = extremely).

Posttraumatic factors. The Perceived Social Support Questionnaire (Guay & Miller, 2000) is a self-administered questionnaire in French adapted from the Perceived Supportive Spouse Behaviors and Perceived Negative Spouse Behaviors scales (Manne, Taylor, Dougherty, & Kemeny, 1997). The positive social support scale measured the frequency of 11 perceived supportive behaviors (i.e., tangible and emotional support) received from a significant other (e.g., spouse, colleague, friend, or family member) in the month following the traumatic event. The negative responses scale measured the frequency of 12 perceived negative behaviors (i.e., criticism and avoidance) received from the same significant other. This questionnaire has shown high internal consistency for the positive and negative support scales ($\alpha$s = .87 and .85, respectively; St-Jean-Trudel, Guay, & Bonaventure, 2003). It has also shown moderate convergent validity ($\alpha$s = .44 and −.43, respectively) with the Social Provisions Scale (Cutrona & Russell, 1987).

To measure support received at work, the research team developed two questions to assess the perception of positive social support received
from colleagues and the officers’ superior after the traumatic event. The question read as follows: “Following the event, rate the support you received from your colleagues.” The same wording was used to measure support from the superior. Each question was answered using a 5-point Likert scale (1 = I did not receive any support, 5 = I received enormous support).

Research Design

A correlational design was used for this study. Independent variables were (a) pretraumatic factors: demographics, work experience, age at time of trauma, history of individual and familial psychiatric disorders, previous stressful and traumatic events, personal beliefs, personality hardiness, and coping strategies; (b) peritraumatic factors: trauma severity, physical and emotional reactions, dissociation, and perceived social support from colleagues and superior; and (c) posttraumatic factors: perceived social support from colleagues, superior, and a significant other. Presence of full or partial PTSD versus absence of PTSD related to the worst traumatic event at work was the dichotomous dependent variable.

Statistical Analyses

Data were analyzed using the Statistical Package for the Social Sciences Version 11.5 (SPSS, Chicago, IL). Prior to analyses, missing values were replaced with the mean for the entire series for 6 (4.5%) participants. Significant risk and protective factors identified in the simple logistic regression analyses were considered for a sequential, stepwise, multiple logistic regression analysis.

RESULTS

Prevalence of PTSD

Almost 8% of the sample had lifetime full PTSD and 7% had lifetime partial PTSD following their most stressful duty-related traumatic event. At interview time, none of the participants had current PTSD with reference to that event. Regarding traumatic events that had occurred off duty and before the trauma at work, almost 5% of the sample met diagnostic criteria for lifetime full PTSD, and 6% met criteria for lifetime partial PTSD.

Prediction of PTSD Symptoms

Because there were not enough participants with full-blown PTSD following the event, subsequent analyses involved dichotomizing the participants’ status. The symptomatic group included participants with full (7.6%) or
partial (6.8%) PTSD, whereas the asymptomatic group included participants with no symptomatology or an insufficient number of symptoms to qualify for partial or full PTSD. Officers with full and partial PTSD did not differ significantly from one another in terms of trauma severity, $t(17) = 0.34, p > .05$; number of current psychiatric disorders, $t(17) = -1.0, p > .05$; number of lifetime psychiatric disorders, $t(17) = -1.28, p > .05$; age at interview, $t(17) = -2.05, p > .05$; age at time of trauma, $t(17) = 1.75, p > .05$; education attained, $t(17) = 1.0, p > .05$; or work status (Fisher $p > .05$). All officers with PTSD, either full or partial, were married or in a relationship. Furthermore, there were no significant differences in demographics between the symptomatic and asymptomatic groups, except for in terms of gender. Indeed, no women were diagnosed with full or partial PTSD following the duty-related event.

The data analysis of predictors of PTSD was done in two phases. First, simple logistic regression analyses were used to examine the relationship of each independent variable with PTSD. Table 1 shows odds ratios (ORs) and 95% confidence intervals (CIs) for all variables associated with the presence of full and partial PTSD. Significant ORs greater than 1 were putative risk factors, whereas ORs less than 1 were assumed to be protective factors. Simple logistic regression analyses indicated that pretraumatic (personality hardness), peritraumatic (social support from colleagues during the event, dissociation, physical and emotional reactions), and posttraumatic (social support from colleagues after the event) factors were significantly associated with full and partial PTSD.

Second, a sequential, stepwise, multiple logistic regression analysis was performed on these six significant variables to clarify the adjusted contributions of these factors. Variables were entered in three consecutive blocks based on their chronological order. Pretraumatic variables were entered in the first block. In the second block, peritraumatic variables were entered. Finally, the third block included posttraumatic variables. The three blocks were assessed sequentially using the forward entry method. In the first model, personality hardness was significant, $\chi^2(1, N = 132) = 6.67, p < .05$, with an effect size of .09 (Nagelkerke $R^2$). Participants with higher scores on the Short Hardiness Scale were less likely to report PTSD symptoms (adjusted OR = 0.74, CI = 0.58–0.93, $p < .05$). The second model identified two significant peritraumatic factors, dissociation and social support, $\chi^2(2, N = 132) = 31.10, p < .001$, with an effect size of .44 (Nagelkerke $R^2$). Participants with higher scores on the Peritraumatic Dissociative Experiences Questionnaire had a greater likelihood of experiencing PTSD symptoms (adjusted OR = 2.17, CI = 1.50–3.14, $p < .001$). Participants who scored higher on a question about positive social support received from colleagues were less likely to report PTSD symptoms (adjusted OR = 0.80, CI = 0.67–0.97, $p < .05$). The posttraumatic variables entered in the third block did not make an independent contribution to PTSD over and above the variables entered in the previous two blocks.
**TABLE 1** Association Between Potential Predictors and Presence of Full and Partial PTSD in a Simple Logistic Regression (N = 132)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Odds Ratio</th>
<th>95% Confidence Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Demographics</strong>&lt;sup&gt;a&lt;/sup&gt;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age at interview</td>
<td>1.03</td>
<td>0.99–1.08</td>
</tr>
<tr>
<td>Years of education</td>
<td>0.90</td>
<td>0.70–1.14</td>
</tr>
<tr>
<td><strong>Pretraumatic factors</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of previous stressful events off duty (n = 51)</td>
<td>0.95</td>
<td>0.81–1.11</td>
</tr>
<tr>
<td>History of previous traumatic events off duty (&lt;i&gt;n&lt;/i&gt; = 51)</td>
<td>1.92</td>
<td>0.65–5.71</td>
</tr>
<tr>
<td>History of previous diagnosis of partial PTSD&lt;sup&gt;b&lt;/sup&gt; (&lt;i&gt;n&lt;/i&gt; = 8)</td>
<td>2.34</td>
<td>0.29–19.01</td>
</tr>
<tr>
<td>History of previous psychiatric disorders (&lt;i&gt;n&lt;/i&gt; = 26)</td>
<td>0.91</td>
<td>0.27–3.00</td>
</tr>
<tr>
<td>History of psychiatric disorders in the family (&lt;i&gt;n&lt;/i&gt; = 32)</td>
<td>1.24</td>
<td>0.38–4.03</td>
</tr>
<tr>
<td>Age at time of trauma</td>
<td>1.04</td>
<td>0.96–1.12</td>
</tr>
<tr>
<td>Work experience</td>
<td>1.00</td>
<td>0.99–1.01</td>
</tr>
<tr>
<td><strong>Personal beliefs</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Benevolence of the world</td>
<td>0.86</td>
<td>0.59–1.26</td>
</tr>
<tr>
<td>Meaningfulness of the world</td>
<td>1.14</td>
<td>0.79–1.63</td>
</tr>
<tr>
<td>Self-worth</td>
<td>0.97</td>
<td>0.62–1.51</td>
</tr>
<tr>
<td>Total score</td>
<td>1.02</td>
<td>0.55–1.91</td>
</tr>
<tr>
<td><strong>Personality hardness</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Commitment</td>
<td>0.95</td>
<td>0.68–1.32</td>
</tr>
<tr>
<td>Challenge</td>
<td>0.74&lt;sup&gt;*&lt;/sup&gt;</td>
<td>0.58–0.93</td>
</tr>
<tr>
<td>Control</td>
<td>0.99</td>
<td>0.69–1.44</td>
</tr>
<tr>
<td>Total score</td>
<td>0.70</td>
<td>0.46–1.06</td>
</tr>
<tr>
<td><strong>Coping strategies</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Task-oriented coping</td>
<td>0.79</td>
<td>0.56–1.11</td>
</tr>
<tr>
<td>Emotion-oriented coping</td>
<td>1.10</td>
<td>0.81–1.49</td>
</tr>
<tr>
<td>Avoidance-oriented coping</td>
<td>0.84</td>
<td>0.64–1.09</td>
</tr>
<tr>
<td><strong>Peritraumatic factors</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trauma severity</td>
<td>1.05</td>
<td>0.77–1.43</td>
</tr>
<tr>
<td>Initial physical reactions</td>
<td>1.48&lt;sup&gt;*&lt;/sup&gt;</td>
<td>1.06–2.07</td>
</tr>
<tr>
<td>Initial emotional reactions</td>
<td>1.60&lt;sup&gt;**&lt;/sup&gt;</td>
<td>1.20–2.12</td>
</tr>
<tr>
<td>Dissociation</td>
<td>2.27&lt;sup&gt;***&lt;/sup&gt;</td>
<td>1.60–3.24</td>
</tr>
<tr>
<td>Perception of positive social support from colleagues</td>
<td>0.77&lt;sup&gt;**&lt;/sup&gt;</td>
<td>0.65–0.90</td>
</tr>
<tr>
<td>Perception of positive social support from a significant other</td>
<td>1.13</td>
<td>0.93–1.38</td>
</tr>
<tr>
<td>Perception of negative responses from a significant other</td>
<td>1.18</td>
<td>0.81–1.71</td>
</tr>
<tr>
<td>Perception of positive social support from colleagues</td>
<td>0.79&lt;sup&gt;**&lt;/sup&gt;</td>
<td>0.66–0.93</td>
</tr>
<tr>
<td>Perception of positive social support from superior</td>
<td>0.95</td>
<td>0.81–1.11</td>
</tr>
<tr>
<td>Perception of negative responses from superior</td>
<td>0.90</td>
<td>0.78–1.04</td>
</tr>
</tbody>
</table>

**Notes:** PTSD = posttraumatic stress disorder.

<sup>a</sup>Gender was not entered in the simple regression because no women were diagnosed with full or partial PTSD.

<sup>b</sup>History of previous diagnosis of full PTSD was not entered in the simple regression because none of the participants who met criteria for full or partial PTSD after the trauma at work had a history of previous full PTSD off duty.

<sup>*</sup><i>p < .05</i>

<sup>**</sup><i>p < .01</i>

<sup>***</sup><i>p < .001</i>
DISCUSSION

Peritraumatic Predictors of PTSD

We first hypothesized that peritraumatic and posttraumatic factors would have a greater impact than pretraumatic factors on PTSD. This hypothesis was partially supported. In fact, one pretraumatic predictor, personality hardiness, was significant and explained 9% of the variance in the first model. The second model supported our hypothesis because two peritraumatic predictors (i.e., dissociation and positive social support from colleagues) explained an additional 35% of the variance, that is, almost 4 times the variance explained by the first model. As suggested, peritraumatic factors were the most potent predictors of PTSD. However, no significant predictors emerged at the posttraumatic level. Overall, these findings extend those of previous studies that found that peritraumatic factors were among the best predictors of PTSD (Bernat et al., 1998; Brewin et al., 2000; Ozer et al., 2003).

Dissociation

As hypothesized, peritraumatic dissociation was an important predictor of PTSD in our study. Moreover, as in previous studies (Bernat et al., 1998; A. Martin & Marchand, 2003), we found that all peritraumatic reactions (i.e., dissociation, emotional reactions, and physical reactions) were significantly intercorrelated. Moleman, van der Hart, and van der Kolk (1992) suggested that physiological hyperarousal states may induce dissociation. A recent study found that physical symptoms of panic mediated the relationship between traumatic fear and peritraumatic dissociation (Fikretoglu et al., 2007). Therefore, it seems that intense emotional states lead to physiological hyperarousal, which in turn precipitates dissociation. Even though dissociation is an attempt to cope with strong emotions and may be considered an adaptive response to trauma, several lines of research (Breh & Seidler, 2007; Ozer et al., 2003), including this study, suggest that it increases the risk for subsequent PTSD. However, a review of prospective studies indicated that peritraumatic dissociation is not an independent predictor of PTSD (van der Velden & Wittmann, 2008). When other factors, such as initial mental health problems, were controlled, dissociation added no significant explanation to the variance in PTSD. Furthermore, Bryant’s (2007) literature review challenged the notion that a linear relationship exists between dissociation and PTSD. Recent evidence implies that the association between peritraumatic dissociation and subsequent PTSD seems more complex than it first appeared. Although it is apparent in many studies, including this one, that peritraumatic dissociation is an important factor for PTSD, its independent predictive role is still unclear at this time.
Trauma Severity

Contrary to our hypotheses, trauma severity was not found to be a significant risk factor in our study. Trauma severity remains a complex and controversial concept because there is no consensus as yet on the dimensions that should compose this construct or on how it should be measured (M. Martin et al., 2006).

Social Support

Partly consistent with our hypotheses, perceptions of peritraumatic and posttraumatic positive social support from coworkers were both significantly associated with PTSD. However, only peritraumatic social support (i.e., perceived support from coworkers in the first few hours or days following the trauma) remained a significant predictor of PTSD in the final model. Earlier research with police officers as well as a recent meta-analysis also reported a protective effect of positive social support on PTSD (McCaslin et al., 2006; Ozer et al., 2003; Pole et al., 2005; Stephens, 1997).

To the best of our knowledge, no research has looked at social support as a peritraumatic protective factor. Social support is often measured in the months following trauma exposure rather than during or shortly thereafter. However, studies on high-risk populations (e.g., police, soldiers, firefighters, paramedics, rescue workers) should focus on peritraumatic social support because coworkers and superiors are often present during the traumatic event. In our study, social support from the superior was not associated with PTSD. It may be that police officers tend to confide in their peers more than in their superiors. Moreover, peer social support could be considered more important than support from a superior because police culture values fraternity, complicity, and trust, especially between officers.

Contrary to expectations, perceptions of positive social support and negative responses from significant others were not significant predictors of PTSD. One possible explanation for this is related to the measure of social support we used. The Perceived Social Support Questionnaire was originally created to look specifically at spousal support, but we adapted this instrument to measure support received from any close personal relationship (work partner, spouse, family member, or friend). Some questions might have been less applicable or less relevant to support received from persons other than spouses.

Hypothetical Predictors

We also examined the impact of work experience and adaptive coping strategies, which were identified as protective factors in previous work (Dyregrov et al., 1996; Sharkansky et al., 2000). Yet in our study these were not significantly associated with PTSD.
Clinical Implications

The results of this study have implications for prevention and intervention guidelines. Throughout training, police organizations can facilitate resiliency in their personnel by teaching adaptive coping skills, strategies to cope with strong emotions, as well as means to reduce physiological arousal and prevent the occurrence of peritraumatic dissociation. After a traumatic event, individuals can be screened for PTSD through assessment of well-known peritraumatic risk factors. Clinicians can educate coworkers, supervisors, and even family members of traumatized officers about how to provide positive support. Finally, during treatment, therapists can facilitate the development of resilient mechanisms and lessen the negative impact of risk factors.

Limitations and Strengths

The conclusions that may be drawn from our findings are limited for several reasons. The correlational nature of the study’s design does not permit causal inferences. One should be aware that the stepwise approach used here increases the probability of Type I error, so findings should be interpreted with caution. Also, retrospective measurement can produce recall bias and influence the reported degree of some predictors, such as dissociation. Furthermore, police culture may promote more socially desirable answers, leading to an underreporting of PTSD symptoms. In fact, few participants met the criteria for PTSD. Another limitation is that our results may generalize primarily to police officers, a high-risk population not necessarily representative of civilian populations who face trauma. Furthermore, our sample might not be entirely representative of all personnel working in the Montreal metropolitan area because participation was voluntary and response rate was low. The possibility that nonparticipants might have been more distressed or symptomatic cannot be excluded. The findings herein should be interpreted cautiously given the relatively low response rate and should be considered applicable primarily to the participants of this study.

Despite these limitations, our study has major methodological strengths. We measured potential predictors of PTSD in a relatively understudied population. A well-validated structured interview was used to diagnose PTSD and other psychiatric disorders, in contrast to many other studies that have used self-administered questionnaires. Diagnoses of both lifetime and current PTSD were made. Using standardized instruments, we measured numerous variables, including both risk and protective factors. We measured several hypothetical protective factors not previously assessed or frequently evaluated in studies of police officers (e.g., personality hardiness, personal beliefs, coping). Diverse sources of social support (e.g., colleagues, superiors, a significant other) and various types of social support (e.g., positive, negative, peri- and posttraumatic support) were also
measured. Finally, multivariate analyses were used to delimit the impact of putative predictors.

Future Research

More prospective and longitudinal studies are encouraged to examine the course of posttrauma reactions, to distinguish predictors for PTSD development from factors associated with PTSD maintenance or chronicity, and to investigate the impact of cumulative stressful events over time, especially for high-risk populations. Empirically sound research is also needed to delineate the role that dissociation may play in mediating subsequent PTSD and to critically examine the nature of this construct.

REFERENCES


