Article

The Impact of Critical Incidents and Workload on Functioning in the Private Life of Police Officers: Does Weakened Mental Health Act as a Mediator?

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Abstract This study examined the disintegrating effects of critical incidents (Cri) and workload (WL) on the mental health status (MHS) and private life tasks of 166 police officers. In addition, it investigated whether diminished MHS mediated the impact of Cri and WL on private life tasks. This mediation effect was based on the work–home resources model of Brummelhuis and Bakker (2012). The respondents were police officers functioning in the front line, experiencing Cri and working in urban areas. We investigated the effects on the following five private life tasks: 'social life, maintaining mental health, household and finance, giving meaning, and maintaining positivity'. The results showed that Cri only had a negative effect on 'maintaining positivity'. Respondents reporting more Cri had a lower MHS, which in turn had a direct effect on the functioning in all private life tasks except 'social life'. When mediated by MHS, Cri were associated with less effective functioning in all private life tasks except for 'social life'. Thus, the effects of Cri on functioning in private life tasks (except social life) were larger for respondents with a low MHS. The largest effects were found for 'maintaining mental health (MMH) and maintaining positivity'. In the WL model, no significant indirect effects were found on life tasks.

Introduction

Police officers report higher stress levels than other members of the workforce and a higher rate of absenteeism (Tang and Hammontree, 1992; Houtman *et al.*, 2005). To distinguish the literature in this article, we cite literature of police officers and rescue workers (ambulance personal, firefighters, first responders). Rescue work professions and police officers are at greater risk for mental health problems, such as depression, post-traumatic stress

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disorder (PTSD), burnout, and substance abuse, than individuals in other professions (Maia *et al.*, 2007; Asmundson and Stapleton, 2008; Shochet *et al.*, 2011; Austin-Ketch *et al.*, 2012). Research findings by Green (2004) revealed that PTSD is four to six times more prevalent among police officers than in the general public. Furthermore, police officers have a higher risk of developing heart problems, gastrointestinal disorders, and diabetes (Violanti *et al.*, 2006). Police work is generally recognized as highly demanding and high-risk (Gershon et al., 2009). A Dutch study (Houtman *et al.*, 2005) showed that job stress for police officers is higher than for average Dutch employees. Their jobs entail a higher tempo and contain more sources of tension. Similarly, a British study (Paton, 2005) established stress as the most frequent cause of sick leave in British police officers. A Swiss study among police officers (Gerber *et al.*, 2010) linked increased stress to poorer health. It is important to realize that different rescue work occupations have different roles and responsibilities. The comparable aspect is that in these occupations, the personal and professional risk is taken to save one's life and/or take care for safety of others. Even for policemen, a substantial part of their job is first aid help like resuscitations. 'The job context of police work has special aspects that influence their job experience, health, and private life. For example, working in shifts Vila (2006) and confronted with moral dilemmas, political pressure (Birch *et al.* 2016) . In the latter, a central concern was that the rights of police officers are not the same as a citizens, where innocent until proven guilty' is the rule. Police officers remain under an informal scrutiny and often times speculation that became problematic. In addition, police work also entails working at a high pace and working overtime, which diminishes the ability to relax and recover from work demands (Sanz-Vergel *et al.*, 2010). Workload (WL) is related to management issues (Velden *et al.*, 2010; Pisanti *et al.*, 2011). For example, in understaffing, it is a daily struggle to get schedules around. Eriksen and Kecklund (2007) and Sonnentag and Zijlstra (2006) indicated that officers who were afforded flexibility to determine their schedule for shift work were better able to integrate their work into their private lives and were less likely to experience sleep disturbances.

The influence of work on the person and his or her life is developed in work psychology (Arnold, 2005). In work psychology, five factors are important: 1. the particular thoughts, behaviour, emotion in question; 2. differences between people to which they characterize their behaviour; 3. situational factors; 4. the consequences of interaction between 2 and 3; and 5. any ways in which particular thoughts, behaviours, or emotions might feedback to produce changes in 2 and 3. Life tasks represent the perceived effectiveness of the ability to build up a life. Witmer and Sweeney (1992) developed a holistic model for wellness and prevention over the life span. In this model, the theory of Adler (1956) and Maslow (1970) is an important base. They describe five life tasks: spirituality, self-regulation, work, love, and friendship. Perceived efficacy in life tasks acts as resources for good mental health and well-being. They help people flourish in their life. It requires discipline and proactive behaviour to maintain life tasks when under pressure. The pressure that workers experience and the stress that builds up take a toll on their family life, which in turn affects their resources, such as a stable relationship and family life, happiness, vitality, and financial position (Heshmati, 2007; Slottje *et al.*, 2007; Cicognani *et al.*, 2009).

Research on job stress has linked work–family conflicts to negative outcomes, including poor health and well-being, for individuals and their families (Bianchi *et al.*, 2005; Wierda-Boer *et al.*, 2009; Bakker and Demerouti, 2013). Shreffler *et al.* (2011) also associated occupational stress, long working hours (>60 h a week), and lack of sleep with greater work-to-family conflicts and a higher perceived burden of childcare. The mental health problems of police officers thus extend to their family members (Davidson *et al.*, 2006).

Longitudinal research demonstrates that the larger the number of years in service and the number of critical incidents (Cri) experienced results in more mental health complaints, poorer health, and a higher rate of sick leaves (Paton, 2005; Morren *et al.*, 2007; Gerber *et al.*, 2010).

Recent studies have shown that the accumulation of Cri makes rescue workers susceptible to developing psychological and physical symptoms, such as PTSD, depression, health problems, state anger, anger out, emotional dissonance, and burnout (Alexander and Klein, 2009; Boer *et al.*, 2011; Goodson *et al.*, 2011; Monnier *et al.*, 2002). Cri account for 53% of the variance in the officers' PTSD (Menard and Arter, 2013). Situations in which police officers were confronted with the victims' vulnerability (e.g. abuse, murder cases) were associated with higher rates of reported PTSD (Carlier *et al.*, 2000). Furthermore, Cri in which children were involved and/or there was a shortage of supplies/resources were linked to higher reported distress (Declercq *et al.*, 2011). Hence, we hypothesize that Cri have a direct negative effect on mental health status (MHS) (Hypothesis 1).

In addition to Cri, a heavy WL also leads to an increase in stress among police officers. A heavy WL is associated with more reported somatic and psychological complaints (Gerber *et al.*, 2010; Wang *et al.*, 2010). Enhanced and prolonged physiological stress reactivity can lead to depletion of resources over time (Anderson *et al.*, 2010).

Rescue workers can develop work-related psychological problems and physical symptoms even 12- and 18-months post-adversity, leading to additional sick leaves. This demonstrates the pressing need to reduce work-related stress at work among rescue workers (Morren *et al.*, 2007; Wang *et al.*, 2010).

On the basis of the above results, we expect that WL has a direct negative effect on MHS (Hypothesis 2).

Negative work–home spillover

To examine whether the impact of the demands of police work on the functioning in their private life is mediated by MHS, we based our study on the causal chain, postulated in the work–home resources (W-HR) model (Brummelhuis and Bakker, 2012). In this study, we used one part of this model path of the diminished process (decline of resources). In this research, negative work demands like WL and Cri diminish positive resource mental health and causes negative home outcomes and lower effectiveness on private life tasks.

This model is based on the conservation of resources theory, which regards stress as a loss of energy (Hobfoll and Freedy, 1993). According to Hobfoll (1998), Monnier *et al.*, (2002), and Brummelhuis and Bakker (2012), we regard stress as a response to the loss (or the threat of loss) of resources and is based on the premise that individuals strive to obtain, retain, protect, and foster those things that they value. Stress is believed to occur when individuals or groups are faced with situations with threat of a loss of resources or there is already loss of resources.

Bakker and Demerouti (2013) have asserted that employees who are confronted with work overload and high emotional demands have more difficulties balancing their work and their private life. High job demands require employees to devote more resources (e.g. time, energy) to work, leaving them with fewer resources to devote to their family (Frone *et al.*, 1997). Another way in which work demands hamper functioning at home is when experiences at work (e.g. negative emotions, fatigue) spill over to the home domain (Bakker and Demerouti, 2013).

It is hypothesized that MHS has a direct negative effect on private life tasks (Hypothesis 3) and that Cri have a direct negative effect on private life tasks (Hypothesis 4). Furthermore, we also hypothesize that WL has a direct negative effect on private life tasks (Hypothesis 5). We expect that work demands (Cri and WL) induce a negative spillover from work

to home, which results in a reduced effectiveness in life tasks. Since these work demands are also assumed to diminish MHS, we expect that the negative impact of work demands on effectiveness in private life tasks will be higher when the MHS is weakened.

In a longitudinal study, Demerouti *et al.* (2004) examined how chronic effects develop. When work demands have a negative impact on effectiveness in life tasks, home resources (e.g. recovery opportunities, social support) may decrease. This in turn may result in difficulties in dealing with the work demands. Due to this so-called loss spiral, work pressure and exhaustion have causal and reversed causal relationships with functioning in life tasks over time. For example, work pressure causes exhaustion and in turn, exhaustion makes it difficult to handle work pressure and worsens the exhaustion.

The loss spiral has also been found in a prospective longitudinal study of healthy police officers, duty-related depression was found after 12 months, pressing the need for strategies to reduce work stress (Wang *et al.*, 2010). Finally, Morren *et al.* (2007) found that sick leave and psychological problems increased 18 months post-trauma compared to a control group of non-involved rescue workers. In a 1-year follow-up study with ambulance workers, Sterud *et al.* (2011) found that job satisfaction reduced and health problems increased. Lower job satisfaction was associated with a lack of support from superiors and with the severity of challenging job tasks.

It is presumed that Cri have a negative effect on the effectiveness in private life tasks when mediated by MHS (Hypothesis 6). Moreover, we assume that WL has a negative effect on effectiveness in private life tasks when mediated by MHS (Hypothesis 7).

In sum, the purpose of this study was to gain more insight into the impact of work demands on the private life of policemen. In this study, we examine the depletive effects of Cri and WL on mental health and the consequent degrading effect on functioning in private life. We particularly investigated whether mental health plays a mediating role in these effects. The results are analysed and discussed based on the W–HR model (Brummelhuis and Bakker, 2012).

Method

Participants

The respondents were police officers who were referred to psychological help for their psychological complaints and absenteeism. Only police officers who have been exposed to Cri in the line of duty were included in the study. Depending on the severity of their complaints and problems, they received 10–20 sessions of psychological personal training. Prior to starting psychological personal training, they completed psychological questionnaires. Participants signed an informed consent form to participate in this study. The sample consisted of 166 police officers. All participants were selected from an urban area in the Netherlands. Of these respondents, 69 (41.57%) were female and 90 (54.22%) were male subjects, aged between 16 and 63 years, with a *M* (SD) of 44.55 years (10.43). A total of 77 (46.4%) participants lived with a partner. The *M* (SD) service years amounted to 17.57 (11.69). Most participants had one or more children (69.4%). Education was mostly middle level (66.9%), and 18.1% reported higher education. All participants were selected from an urban area in the Netherlands.

Measures

Cri *inventory* (Monnier *et al.*, 2002). This inventory was used to measure the number of Cri. In line with Monnier *et al.* (2002), we adopted the following definition: 'The trauma events faced by rescue workers during the course of their job are Cri (e.g. responding to a motor vehicle accident) (p. 12)

This self-report instrument consists of 24 items, and participants responded on a four-point Likert scale, ranging from 0 'never experienced this event' to 3 'experienced three or more times'. Examples of

items included 'Line of duty death of a fellow emergency worker' and 'Incident requiring police protection while on duty'. Monnier *et al.* (2002) reported a median of 8.5 incidents and a range of 0–53. This was considerably lower than in our sample. In this study, the following values were obtained: M = 25.93, SE = 18.53, and median = 25. This result cannot be seen as the total amount of Cri because the final answer involves the frequency 'three or more times' only. In this study, we asked about Cri during their entire career as rescue workers. Comparing the internal validity with a norm group is not possible because other studies used different questions over a different time period (see also Monnier *et al.*, 2002).

Experienced WL. This scale is taken from the Dutch organizational stress questionnaire (VOS-D; Caplan and Jones, 1975; Bergers *et al.*, 1986). The scale used a four-point response Likert scale, ranging from 'never' through 'often'. An example of one of the items was 'Are there moments where you can take it easier during work?' Cronbach's alpha of the WL scale in this study is 0.86, which is good. The descriptive statistics in this research were compared with the norm group 'middle class employees' composed by the authors for the validation of the VOS-D questionnaire. Respondents were supposed to score these questions on a five-point Likert scale, ranging from 'very high' to 'very low' and 'very often' to 'rarely'.

MHS. To measure MHS, we used the widely administered SCL-90 (symptom checklist) to evaluate experienced mental health complaints. It provided an indication of the general mental health complaints that hinder the respondent's performance in his/her daily life, such as anxiety, agoraphobia, depression, somatic complaints, distrust, interpersonal sensitivity, hostility, and sleep disorders. For this study, we only used the total score on general mental health as included in the Dutch version of SCL-90, which is considered valid and reliable (Arrindell and Ettema, 1986). Respondents were asked to indicate symptoms that occurred in the past week. The SCL-90 has been used in several studies on rescue workers (e.g. Van der Velden *et al.*, 2010; Wagner *et al.*, 2010; Van der Velden *et al.* 2012). In this sample, the Cronbach's alpha was 0.85. The used scale is the PSNEUR, which is a total score of the subscales. These subscales of health complaints are: agoraphobia (I am afraid to go home alone), anxiety (I feel anxious), depression (I feel lonely), somatic complaints (I feel dizzy), insufficiency in thinking and feeling (I have difficulties making decisions), interpersonal sensitivity (I am critical to others), hostility (I feel bored and irritated), sleeping problems (I have difficulties falling asleep). The response categories are: very low, low, below average, average, above average, high, very high (a seven-point Likert scale). The scores for MHS (M = 185.51, SE = 57.79) were higher than two standard deviations above the mean score found by Arrindell and Ettema (1986) in their norm group (M = 118.28, SE = 32.38, n = 2368). This was a very high result in comparison with the normal population as a whole and comparable with the mean scores of psychiatric patients.

Life tasks. This self-report instrument was specifically developed for measuring effectiveness in private life tasks (Bakker *et al.*, 2015). The scale has a five-point Likert scale ranging from 'very bad' through 'very good'. The higher the score, the higher is the perceived effectiveness in life tasks. In the domain of 'social life', respondents were presented with four questions or statements. For example, 'I can maintain friendships'. The Cronbach's alpha of the social life scale in the current study was 0.78, which is considered to be good. The second scale was 'maintaining mental health (MMH)', assessed with five questions. For example, 'I can deal with my emotions effectively'. In comparison to the SCL-90, this questionnaire does not address specific complaints about mental health problems. Cronbach's alpha for this scale was 0.72. The third scale, 'household and finance', consisted of four questions. A typical item for this scale was 'I can manage money effectively'. Cronbach's alpha for this scale is 0.67. The fourth scale is 'giving

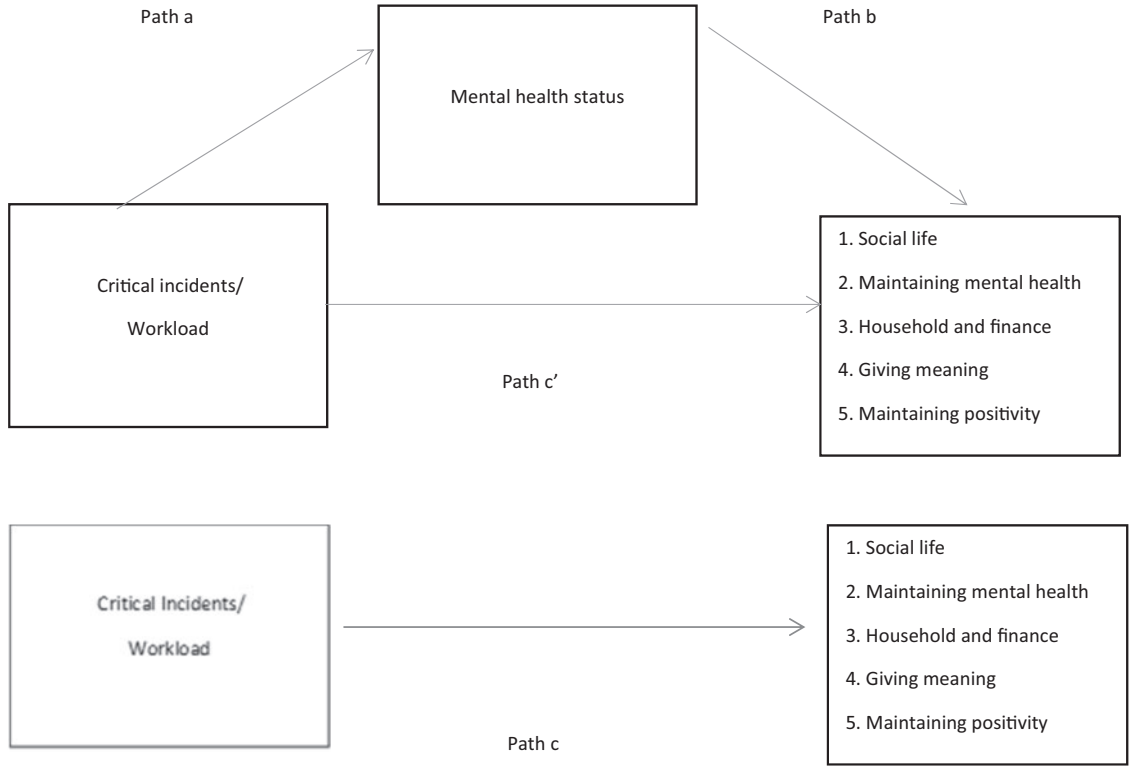

Figure 1: 'Conditional process analysis' (on the basis of Hayes and Preacher, 2014) testing the relation between Cri and WL and private life tasks, mediated by MHS.

meaning'. It includes five questions. An example of one of the questions was 'I try to learn from the things that I experience in life'. Cronbach's alpha for this scale was 0.65. The last scale was 'maintaining positivity', which was measured by two questions. An example of an item was 'The disturbing incidents I experience at work make it hard for me to stay positive'. Cronbach's alpha for this scale is 0.90. In the original version of the life task test, there was a scale on 'partner and family life'. But during scale development, we found that it was unfortunately necessary to remove these items. The reason was that the research group was diverse in terms of different partner and family forms.

Statistical analysis

The model that is researched in this article is illustrated in Fig. 1. It constitutes a mediation model. Path 'a' shows the direct effects of the Cri/WL on MHS. Path 'c' shows the direct effects of Cri/WL on the life tasks and Path 'b' the direct effects of the mediator MHS on the life tasks. Path 'c' shows the full mediation model, namely the indirect (bootstrapping) effects of Cri/WL on life tasks when mediated by MHS.

The hypotheses were tested using conditional process analysis, developed by Hayes and Preacher (2014), in SPSS version 23, after standardizing the variables. This analysis is generally accepted as the procedure of choice for analysing mediation, moderation, and combinations of these. In this case, we examined potential mediation effects. We expected that Cri and WL not only had a (direct) effect on private life tasks but also indirect effects, when mediated by MHS. We report statistical tests for direct effects and indirect

Table 1: Correlations of critical incidents, workload and life tasks

S. No.		1	2	3	4	5	6	7	8
1	Cri (CII)								
2	WL (VOS-D)	−0.224**							
3	MHS (SCL)	0.190*	−0.210**						
4	Social life (life task)	−0.083	0.194*	−0.136*					
5	Mental health (life task)	0.035	0.163*	−0.468**	0.311**				
6	Household and finance (life task)	0.061	0.078	−0.249**	0.275**	0.441**			
7	Giving meaning (life task)	0.023	0.010	−0.256**	0.272**	0.501**	0.393**		
8	Maint. positivity (life task)	−0.298**	0.119	−0.477*	0.088	0.353**	0.155*	0.265*	

$N = 166$.
*$P < 0.05$; **$P < 0.01$.

effects, as well as confidence intervals for these effects. This means that the negative impact of demands on life tasks is expected to be larger when MHS is reduced. The effects are tested by the bootstrapping, which consists of repeatedly randomly sampling observations with replacement from the dataset to compute the desired statistic in each sample. Computing over thousands in this study, of bootstrap resamples provide an approximation of the sampling distribution of the statistic of interest (Preacher and Hayes, 2004, 2008).

Results

Table 1 displays the scales, means, standard deviations, scale reliabilities, and inter-correlations of all variables in this study. The measures relevant in this study are: Cri correlate with MHS and with 'maintaining positivity'. Furthermore, MHS correlated with the life tasks: 'MMH, household and finance, giving meaning, and maintaining positivity'.

Tables 2 and 3 display the results of the conditional analysis on the effects of Cri and WL, respectively, on MHS and the five life tasks. The first rows show the direct effects, and the bottom rows present the results of the indirect effects.

Hypothesis 1. Cri had a direct negative effect on MHS. $b = 0.59$, $t = 2.47$, $P < 0.01$; 95% confidence interval (CI) (0.12–1.06).

Hypothesis 2. WL did not have a direct negative effect on MHS. $b = -0.08$, $t = -1.00$, $P = 0.32$; 95% CI (−0.23 to 0.08).

Hypothesis 3. MHS was negatively related to effectiveness in private life tasks. Negative effects were found for the following life tasks: 'MMH' ($b = -0.01$, $t = -7.06$, $P < 0.01$; 95% CI: −0.01 to −0.004); 'household and finance' ($b = -0.003$, $t = -3.52$, $P < 0.01$; 95% CI: −0.005 to −0.001); 'giving meaning' ($b = -0.002$, $t = -3.52$, $P < 0.01$; 95% CI: −0.004 to −0.001); and 'maintaining positivity' ($b = -0.01$, $t = -6.41$, $P < 0.01$; 95% CI: −0.011 to −0.006). No effect was found on social life task. Similar results were found in the WL model (Table 3).

Hypothesis 4. Cri only had a negative effect in maintaining positivity ($b = -0.01$, $t = -3.16$, $P < 0.002$; 95% CI: −0.02 to −0.005). No direct effects were found for the other life tasks: 'social life, MMH, household and finance, and giving meaning'.

Hypothesis 5 stated that WL has a direct negative effect on private life tasks (path c). The data provide no support for this hypothesis whatsoever.

In Hypotheses 6 and 7, we hypothesized that Cri and WL have a negative effect on effectiveness in private life tasks when mediated by MHS. In the Cri model, the indirect coefficient for social life was not significant, but significant effects were found for the other life tasks: 'MMH' ($b = -0.003$; 95% CI: −0.01 to −0.0006), 'household and finance' ($b = -0.002$;

Table 2: Conditional analysis of the effects of Cri on MHS on life tasks and the results of the bootstrapping

Direct effects	B	SE	*t*	*P*-value	95% CI
Cri—MHS	0.59	0.24	2.47	0.01*	0.12 to 1.06
Cri—social life	−0.002	0.00	−0.75	0.46	−0.01 to 0.003
Cri—MMH	−0.005	0.00	1.84	0.07	−0.0003 to 0.01
Cri—household and finance	0.004	0.00	−1.47	0.14	−0.001 to 0.01
Cri—giving meaning	0.002	0.00	0.96	0.34	−0.002 to 0.01
Cri—maintaining positivity	−0.01	0.00	−3.16	0.002**	−0.02 to −0.005
MHS—social life	−0.001	0.00	−1.58	0.12	−0.002 to 0.003
MHS—MMH	−0.01	0.00	−7.06	0.01**	−0.01 to −0.004
MHS—household and finance	−0.003	0.00	−3.52	0.01**	−0.005 to −0.001
MHS—giving meaning	−0.002	0.00	−3.52	0.01**	−0.004 to −0.001
MHS—maintaining positivity	−0.01	0.00	−6.41	0.01**	−0.011 to −0.006
Indirect effects					
Bootstrapping	*b*	SE			
Cri—MHS—social life	−0.001	0.00			−0.003 to 0.0001
Cri—MHS—MMH	−0.003	0.00			**−0.01 to −0.0006**
Cri—MHS—household and finance	−0.002	0.00			**−0.001 to −0.0003**
Cri—MHS—giving meaning	−0.001	0.00			**−0.004 to −0.0002**
Cri—MHS—maintaining positivity	−0.01	0.00			**−0.011 to −0.001**

Notes. $n = 166$; CI = 95% CI.
*$P < 0.05$; **$P < 0.01$.
CI in bold are significant.

Table 3: Conditional analysis of the effects of WL on MHS on life tasks and the results of the bootstrapping

Direct effects	*b*	SE	*t*	*P*-value	95% CI
WL—MHS	−0.08	0.08	−1.00	0.32	−0.23 to 0.08
WL—social life	0.05	0.04	1.24	0.22	−0.03 to 0.12
WL—MMH	0.04	0.05	0.83	0.41	−0.05 to 0.13
WL—household and finance	−0.01	0.05	−0.34	0.73	−0.11 to 0.08
WL—giving meaning	−0.02	0.04	−0.53	0.60	−0.10 to 0.06
WL—maintaining positivity	−0.06	0.08	−0.79	0.43	−0.09 to −0.21
MHS—social life	−0.06	0.04	−1.65	0.10	−0.14 to 0.01
MHS—MMH	−0.31	0.05	−6.69	0.001**	−0.40 to −0.22
MHS—household and finance	−0.15	0.05	−3.30	0.001**	−0.25 to −0.06
MHS—giving meaning	−0.13	0.04	−3.42	0.001**	−0.21 to −0.06
MHS—maintaining positivity	−0.53	0.08	−6.86	0.01**	−0.68 to −0.37
Indirect effects					
Bootstrapping	*b*	SE			
WL—MHS—social life	0.005	0.01			−0.003 to 0.03
WL—MHS—MMH	0.02	0.03			−0.03 to 0.08
WL—MHS—household and finance	0.01	0.01			−0.01 to 0.05
WL—MHS—giving meaning	0.01	0.01			−0.01 to 0.04
WL—MHS—maintaining positivity	−0.04	0.04			−0.04 to 0.13

Notes. $n = 166$.
*$P < 0.05$; **$P < 0.01$.

95% CI: −0.001 to −0.0003), 'giving meaning' (b = −0.001, 95% CI: −0.004 to −0.0002), and 'maintaining positivity' (b = −0.01, 95% CI: −0.011 to −0.001).

The mediated effects of the WL model did not reach significance for any of the five life tasks. The mediation analysis demonstrated that the effects of Cri on functioning in private life tasks (except social life) were larger for respondents with a low MHS.

Discussion

As expected, Cri had a direct negative effect on MHS, which was consistent with many studies (Monnier *et al.*, 2002; Alexander and Klein, 2009; Boer *et al.*, 2011; Goodson *et al.*, 2011; Menard and Arter, 2013), and demonstrated that police work is a high-risk job. In contrast, WL had no direct negative effect on MHS, which was not consistent with other research (e.g. Gerber *et al.*, 2010; Wang *et al.*, 2010). A probable explanation was that this group of participants was assessed during sick leave, and the daily WL may have been experienced less as a stressor (at the time of the study, they were not actively employed) compared to the impact of Cri.

The distinctive aspect of this study is the combination of predictor Cri and WL. There are more studies that press the impact of Cri (Monnier *et al.*, 2002; Ploeg *et al.*, 2003; Wagner *et al.*, 2010; Boer *et al.*, 2011) and others the impact of organization problems like WL in rescue work (Velden *et al.*, 2010; Pisanti *et al.*, 2011). No study was found to examine both predictors. This study shows that Cri and WL are both to be taken seriously when it comes to understanding the impact of rescue work.

Hypothesis 3 was confirmed. MHS had a direct negative effect on private life tasks, with the exception of 'social life'. This is in line with research showing that lower mental health puts private life under pressure (Bianchi *et al.*, 2005; Wierda-Boer *et al.*, 2009; Bakker and Demerouti, 2013). This result may be explained by the fact that police officers' function as teams and find social support among their colleagues. This interpretation is supported by the research of Bartone *et al.* (2002) on the importance of camaraderie in groups. Argentero and Setti (2011) found in 782 rescue workers that a supportive working environment in particular favours engagement, reducing probability of developing burnout. Allen *et al.*, 2000 showed that a supportive organization with attention for family, colleagues, and supervisor support improves job satisfaction, organizational commitment, and less work–family conflict.

As postulated in Hypothesis 4, Cri had a direct negative effect on private life tasks, which was only confirmed for 'maintaining positivity'. This lack of effect is not in line with research that shows negative effects on private life (Slottje *et al.*, 2007; Cicognani *et al.*, 2009; Heshmati *et al.*, 2010). Research on so-called post-traumatic growth shows the importance of maintaining positivity. Positive emotions can foster post-traumatic growth and enhance psychological resources, which act as buffers against depressive symptoms (Calhoun and Tedeschi, 2014). A lack of 'maintaining positivity' makes it difficult to handle the negative impact of major events (Fredrickson, 2000).

Contrary to Hypothesis 5, no direct effects of WL were found on private life tasks. This is not in line with research showing a negative impact of WL on private life (Rau, 2006; Innstrand *et al.*, 2010; Shreffler *et al.*, 2011). As argued earlier, this may be explained by a reduced impact of WL during sick leave, whereas Cri continue to have an impact.

Hypothesis 6 postulated that the impact of Cri on private life tasks would be mediated by MHS. This hypothesis was confirmed for four life tasks but not for social life. Hypothesis 7 regarding the mediation model of WL was not confirmed.

The impact of Cri was rather large (four indirect and one indirect effect) and represents a process of erosion; while employed, Cri degrade MHS, which in turn reduces the effectiveness in private life tasks.

This process is a typical example of the loss spiral described by Bakker and Demerouti (2013) and confirms the diminished process (decline of resources) in the W-HR model (Brummelhuis and Bakker, 2012). Cri diminish mental health and cause lower perceived effectiveness in private life tasks.

This study showed that effectiveness in life tasks is mediated by MHS.

These processes have been shown in longitudinal studies, including Sterud *et al.* (2011), Morren *et al.* (2007), and Wang *et al.* (2010). Although very little is known about the factors that determine the impact on private life tasks, some general remarks can be made. For police officers, Cri may have additional consequences; their home can become unsafe due to triggers related to Cri. Rosner and Powell (2014) showed the importance of safety and the fulfilment of basic needs to foster post-traumatic growth. In a meta-analysis of predictors of PTSD, Brewin *et al.* (2000) concluded that people who live in unsafe circumstances and lack basic needs have a higher risk of developing PTSD symptoms. This is applicable to the present group of police officers, who appear to experience working and living in the same location as a burden because they are confronted in private life with an environment in which Cri occurred and with unsafe situations due to their professional knowledge and experience. Furthermore, they can miss basic needs and may, for example, experience financial problems due to lower income and ill health.

The life task 'social life' was not affected by work demands. One explanation may be that police officers function in a team and regard themselves as effective in social relations. Bartone *et al.* (2002) showed camaraderie in militaries. Argentero and Setti (2011) and Sterud *et al.* (2011) show the importance of colleague and supervisor support for job satisfaction and mental health. Another probable explanation is that they also find it important to keep functioning in the outside world normally, notwithstanding a low MHS. Finally, they may find it difficult to admit their weaknesses. To be able to cope with the (occasionally extreme) demands of their work, it is important to have a strong self-presentation (Bakker *et al.*, 2015) to the outside world. These interpretations are also based on our experience obtained in providing psychological help to rescue workers. The concept of perceived effectiveness, measured with the life task test, can be defined as the ability to master one's life, even under very demanding (work) circumstances. Perceived effectiveness provides control, which is an important basis for mental health (Bakker *et al.*, 2019). Although this concept is situation-specific, it has several similarities to that of self-efficacy as introduced by Bandura in 1997. Self-efficacy has been demonstrated to play a critical role in the recovery from post-traumatic stress (Bandura, 2002; Patterson, 2003) and the impact of loss of resources (Benight and Harper, 2002). Several studies (Prati *et al.*, 2010; Regehr *et al.*, 2003; Heinrichs *et al.*, 2005) have shown that self-efficacy buffered the impact of stressful encounters on the quality of life.

Limitations of this study and future research

This research focused on one specific sample group: police officers with psychological health complaints currently on sick leave. The high scores on mental health problems corroborate the specificity of this group. The experienced WL may have been lower because at the time of the study, they were at home and not confronted with the daily hassles of the WL. During sick leave, Cri can have more impact as they tend to weigh on the mind. We recommend performing similar research on healthier groups, both in the police and among other rescue workers functioning on the front line. The lack of a comparison group in this study makes it difficult to generalize the results to other groups. For future research, it is important to include a control group.

Another point of attention is that in research, a variety of instruments are used to measure Cri. It is

suggested that future research use a standardized instrument regarding the type of questions and period measured. Additionally, more longitudinal studies (such as Sterud *et al.*, 2011) are needed to examine the long-term effects of this depletion process. Future research should pay more attention to the influence of the professional and private contexts on mental health, rather than treating it as an isolated phenomenon, unrelated to the resources, or lack of them, of daily work and life. In addition, more longitudinal research is needed if we are to gain more insight into the loss spiral and process of erosion in rescue work and the prevention of this process.

Practical implications

Our results provide several clues to improve interventions and training for rescue workers. This is in line with the review of Van der Kolk (2015) on guidelines for the treatment and support of traumatized people; he stressed the importance of psychological training for veterans in their everyday lives. They should be trained to cope with stressful job demands to prevent negative spill over from work to private life tasks. When treating mental health problems, such as PTSD, depression, and anxiety, recovery of effectiveness in life tasks may help to improve mental health. Individuals who function well in life tasks feel energized and fulfilled even in high-risk jobs. Sacrificing effectiveness in private life and losing resources is too high a price to pay for rescue work. Prevention in the form of increased recovery time, personal influence on the choice of shifts, temporary retreat from the line of fire, limitations to years on the front line, support from colleagues and leaders, and on-the-job mental health training can be meaningful and help to maintain resources. Alexander *et al.* (2000) concluded in a study of the long-term effects of serial exposure to Cri among paramedics that the most important factor regarding recovery for officers is an organizational climate of care.

More research still has to be conducted on identifying and implementing buffering effects. Furthermore, it would be helpful if the idea that a high-risk job demands a high-care job context would find more acceptance.

Appendix 1: Critical incidents exposure during career

S. No.	Type of incident	Never	Once	Twice	Three times or more
1.	Serious line of duty incident to self	64.5	13.9	9	12.7
2.	Threat of death or serious injury (without actual getting injured)	43.4	9.6	8.4	38.6
3.	Incident necessitating search or rescue involving serious risk to yourself	75.3	15.1	4.2	5.4
4.	Direct exposure to extremely hazardous materials	59.6	18.1	4.2	18.1
5.	Direct exposure to blood and body fluids	58.4	13.9	6.6	21.1
6.	Line of duty death of a fellow rescue worker	54.2	26.5	9.6	9.6
7.	Serious line of duty injury to fellow rescue worker (that did not result in death)	74.7	10.2	5.4	9.6
8.	Threat of serious line of duty injury or threat of death to fellow emergency worker (that did not result in actual serious injury or death)	42.2	5.4	7.2	45.2
9.	Suicide or attempted suicide by fellow emergency worker	45.2	6	6	42.8
10.	Victim(s) known to the rescue worker	36.1	4.8	5.4	53.6
11.	Responded to incident involving three or more deaths	24.1	6	3.6	66.3

(continued)

Continued

S. No.	Type of incident	Never	Once	Twice	Three times or more
12.	Responded to incident involving one or two deaths	48.2	16.9	10.8	24.1
13.	Responded to incident involving multiple serious injuries (three or more victims sustained serious injuries)	51.8	9	11.4	27.7
14.	Incident involving serious injury or death to children	63.9	20.5	10.2	5.4
15.	Incident involving severe threat to children (that did not result in actual serious injury or death to children)	54.8	3.6	6.6	34.9
16.	Incident requiring police protection while on duty	45.8	8.4	7.2	38.6
17.	Verbal or physical threat by public while on duty (that did not result in police protection)	36.1	8.4	10.2	45.2
18.	Failed mission after extensive effort	28.3	63.9	6	1.8
19.	Critical (negative) media interest of an incident where you were involved	60.2	16.3	6.6	16.9
20.	Use of deadly force by police at an incident	68.1	10.8	10.2	10.8
21.	Critical equipment failure or lack of equipment in any of the above situations	92.2	3	3	1.8
22.	Close contact with burned or mutilated victims	68.7	14.5	7.2	9.6
23.	Removing dead body or bodies	34.3	10.2	7.2	48.2
24.	Prolonged extrication of trapped victim with life-threatening injuries	74.1	7.8	5.4	12.7

Notes. Percentages of police officers ($n = 166$) and their exposure to Cri. Measured with the Cri inventory (Monnier *et al.*, 2002).
The sample included 166 police officers, with the average age of 44.57 years (SD = 10. 44 years). In this sample, 41.6% (69) were female officers. The average age of female officers was 40.16 years (SD = 9.7 years). Minimum age reported was 24 years, and maximum age was 59 years. Mean age of male officers was 47.7 years (SD = 9.84), where the youngest officer was aged 23 years, and the oldest was aged 63 years. All the respondents came from the urban area and were included in 2015/2016. Important to note is that all were on sick leave and received some form of mental health counselling.

References

Adler, A. (1956). The Individual Psychology of Alfred Adler. In Ansbacher, H. L. and Ansbacher, R. R. (eds), New York: Basic Books. Vol. 201.

Alexander, D. A., Klein, S., and Bowes, L. B. (2000, March). The long-term effects of serial exposure to critical incidents' among paramedics. Paper presented at the *Third World Conference for the International Society for Traumatic Stress Studies*, Melbourne, Australia.

Alexander, D. A. and Klein, S. (2009). 'First Responders after Disasters: A Review of Stress Reactions, at Risk, Vulnerability, and Resilience Factors'. *Prehospital and Disaster Medicine* **24**(2): 87–94.

Allen, T. D., Herst, D. E., Bruck, C. S., and Sutton, M. (2000). 'Consequences Associated with Work-to Family Conflict: A Review and Agenda for Future Research'. *Journal of Occupational Health Psychology* **5**(2): 278–308.

Anderson, J., Wade, M., Possemato, K., and Quitmette, P. (2010). 'Association between Posttraumatic Stress Disorder and Primary Care Provider-Diagnosed Disease among Iraq and Afghanistan Veterans'. *Psychosomatic Medicine* **72**(5): 498–504.

Argentero, P. and Setti, I. (2011). 'Engagement and Vicarious Traumatization in Rescue Workers'. *International Archives of Occupational and Environmental Health* **84**(1): 67–75.

Arnold, J. (2005). *Work Psychology: Understanding Human Behaviour in the Workplace*. Harlow, UK: Pearson Education.

Arrindell, W. A. and Ettema, J. H. M. (1986). *SCL-90: Handleiding Bij Een Multidimensionele Psychopathologie-Indicator [SCL-90 Symptom Checklist: Manual to a Multidimensional Indicator of Psychopathology]*. Lisse: Swets & Zeitlinger.

Asmundson, G. J. G. and Stapleton, J. (2008). 'Associations between Dimensions of Anxiety Sensitivity and PTSD Symptom Clusters in Active-Duty Police Officers'. *Cognitive Behaviour Therapy* **37**(2): 66–75.

Austin-Ketch, T. L., Violanti, J., Fekedulegn, D. *et al.* (2012). 'Addictions and the Criminal Justice System, What Happens on the Other Side? Post-Traumatic Stress Symptoms and Cortisol Measures in a Police Cohort'. *Journal of Addictions Nursing* **23**(1): 22–29.

Bakker, A. B. and Demerouti, E. (2013). 'The Spillover-Crossover Model'. *New Frontiers in Work and Family Research*, pp. 54–70.

Bakker, A. H. M., Gaillard, A. W. K., van Veldhoven, M. J. P. M., and Hertogs, R. (2015). 'The Impact of Critical Incidents on Mental Health: An Exploratory Pilot Study

into the Moderating Effects of Social Support on the Impact of Adverse Events in Dutch Rescue Workers'. *Policing* **10**(2): 110–112.

Bakker, H., van Veldhoven, M., Gaillard, T., Hertogs, R., Feenstra, M. (2019). 'The Functioning of Rescue Workers in Life Tasks: Development of a Test'. *International Journal of Emergency Services*, in press.

Bandura, A. (2002). 'Social Cognitive Theory in Cultural Context', *Applied Psychology* **51**(2): 269–290.

Bartone, P. T., Johnsen, B. H., Eid, J., Brun, W., and Laberg, J. C. (2002). 'Factors Influencing Small Unit Cohesion in Norwegian Navy Officer Cadets'. *Military Psychology* **14**, 1–22.

Benight, C. C. and Harper, M. L. (2002). 'Coping Self-Efficacy Perceptions as a Mediator between Acute Stress Response and Long-Term Distress following Natural Disasters'. *Journal of Traumatic Stress* **15**(3): 177–186.

Bergers, G. P. A., Marcelissen, F. H. G., and Wolff, C. J. de (1986). *VOS-D: Vragenlijst organisatiestress-D: Handleiding. [VOS-D Questionnaire Organizational Stress-D: Manual]*. Katholieke Universiteit, Nijmegen: Psychologisch Laboratorium.

Bianchi, S. M., Casper, L., and King, R. B. (2005). *Work, Family, Health and Well-Being*. Mahwah, NJ: Lawrence Erlbaum Associates.

Birch, G. S., Vickers, P., Kennedy, M. H., and Michael, H. (2016). 'Procedural Justice and Frontline Policing: The Effects of the Police Complaints System'. *The Journal of Forensic Practice* **18**(3): 170–181.

Brewin, C. R., Andrews, B., and Valentine, J. D. (2000). 'Meta-Analysis of Risk Factors for Posttraumatic Stress Disorder in Trauma-Exposed Adults'. *Journal of Consulting and Clinical Psychology* **68**(5): 748–766.

Boer, J. D., Lok, A., Van't Verlaat, E. *et al.* (2011). 'Work-Related Critical Incidents in Hospital-Based Health Care Providers and the Risk of Post-Traumatic Stress Symptoms, Anxiety and Depression: A Meta-Analysis'. *Social Science & Medicine* **73**: 316–326.

Brummelhuis, ten, L. L. and Bakker, A. B. (2012). 'A Resource Perspective on the Work–Home Interface: The Work–Home Resources Model'. *American Psychologist* **67**(7): 545–556.

Calhoun, L. G. and Tedeschi, R. G. (2014). *Handbook of Posttraumatic Growth: Research and Practice*. London: Routledge.

Caplan, R. D. and Jones, K. W. (1975). 'Effects of Work Load, Role Ambiguity, and Type a Personality on Anxiety, Depression and Heart Rate'. *Journal of Applied Psychology* **60**(6): 713.

Carlier, I. V. E., Voerman, A. E., and Gersons, B. P. R. (2000). 'The Influence of Occupational Debriefing on Post-Traumatic Stress Symptomatology in Traumatized Police Officers'. *British Journal of Medical Psychology* **73**(1): 87–98.

Cicognani, E., Pietrantoni, L., Palestini, L., and Prati, G. (2009). 'Emergency Workers' Quality of Life: The Protective Role of Sense of Community, Efficacy Beliefs and Coping Strategies'. *Social Indicators Research* **94**(3): 449.

Davidson, A. C., Berah, E., and Moss, S. (2006). 'The Relationship between the Adjustment of Australian Police Officers and Their Partners'. *Psychiatry, Psychology and Law* **13**(1): 41–48.

Declercq, F., Meganck, R., Deheegher, J., and Van Hoorde, H. (2011). 'Frequency of and Subjective Response to Critical Incidents in the Prediction of PTSD in Emergency Personnel', *Journal of Traumatic Stress* **24**(1): 133–136.

Demerouti, E., Bakker, A. B., and Bulters, A. J. (2004). 'The Loss Spiral of Work Pressure, Work-Home Interference and Exhaustion: Reciprocal Relations in a Three-Wave Study'. *Journal of Vocational Behaviour* **64**(1): 131–149.

Eriksen, C. A., and Kecklund, G. (2007). 'Sleep, Sleepiness and Health Complaints in Police Officers: The Effects of a Flexible Shift System'. *Industrial Health* **45**(2): 279–288.

Fredrickson, B. L. (2000). 'Cultivating Positive Emotions to Optimize Health and Well-Being', *Prevention and Treatment* **3**(1): 1a.

Frone, M. R., Yardley, J. K., and Markel, K. S. (1997). 'Developing and Testing an Integrative Model of the Work–Family Interface'. *Journal of Vocational Behavior* **50**(2): 145–167.

Gerber, M., Hartmann, T., Brand, S., Holsboer-Trachsler, E., and Pühse, U. (2010). 'The Relationship between Shift Work, Perceived Stress, Sleep and Health in Swiss Police Officers'. *Journal of Criminal Justice* **38**(6): 1167–1175.

Gershon, R. R., Barocas, B., Canton, A. N., Li, X., and Vlahov, D. (2009). 'Mental, Physical, and Behavioral Outcomes Associated with Perceived Work Stress in Police Officers'. *Criminal Justice and Behavior* **36**(3): 275–289.

Goodson, J., Helstrom, A., Halpern, J. M. *et al.* (2011). 'Treatment of Posttraumatic Stress Disorder in U.S. combat Veterans: A Meta-Analytic Review'. *Psychological Reports* **109**(2): 573–599.

Green, B. (2004). 'Post-traumatic Stress Disorder in UK Police Officers'. *Current Medical Research and Opinion* **20**(1): 101–105.

Hayes, A. F. and Preacher, K. J. (2014). 'Statistical Mediation Analysis with a Multicategorical Independent Variable'. *British Journal of Mathematical and Statistical Psychology* **67**(3): 451–470.

Heinrichs, M., Wagner, D., Schoch, W. *et al.* (2005). 'Predicting Posttraumatic Stress Symptoms from Pretraumatic Risk Factors: A 2-Year Prospective Follow-up Study in Firefighters'. *American Journal of Psychiatry* **162**(12): 2276–2286.

Heshmati, A. (2007). 'The Relationship between Income Inequality, Poverty and Globalization'. *The Impact of*

Globalization on World's Poor. Houndmills, Basingstoke, Hampshire, UK: Palgrave Macmillan Ltd., pp. 59–93.

Heshmati, R., Hoseinifar, J., Rezaeinejad, S., and Miri, M. (2010). 'Sensation Seeking and Marital Adjustment in Handicapped Veterans Suffering from PTSD'. *Procedia-Social and Behavioral Sciences* **5**: 1783–1787.

Hobfoll, S. E. (1998). 'Conservation of Resources: A New Attempt at Conceptualizing Stress'. *American Psychologist* **44**(3): 513.

Hobfoll, S. E., and Freedy, J. (1993). 'Conservation of Resources: A General Stress Theory Applied to Burnout'. In Schaufeli, W. B., Maslach, C., and Marek, T. (eds), *Professional Burnout: Recent Developments in Theory and Practice*. Washington, D.C.: Taylor and Francis, pp. 115–133.

Houtman, I. L. D., Jettinghoff, K., Brenninkmeijer, V., and Berg, R. v d. (2005). De politie vijf jaar *later*: *Werkstress en het effect van maatregelen* [Dutch police organization five years later: Workstress and the effect of policy].

Innstrand, S. T., Langballe, E. M., Espnes, G. A., Aasland, O., and Falkum, E. (2010). 'Personal Vulnerability and Work-Home Interaction: The Effect of Job Performance-Based Self-Esteem on Work/Home Conflict and Facilitation'. *Scandinavian Journal of Psychology* **51**(6): 480–487.

Maia, D. B., Marmar, C. R., Metzler, T. *et al.* (2007). 'Post-Traumatic Stress Symptoms in an Elite Unit of Brazilian Police Officers: Prevalence and Impact on Psychosocial Functioning and on Physical and Mental Health'. *Journal of Affective Disorders* **97**(1–3): 241–245.

Menard, K. S. and Arter, M. L. (2013). 'Police Officer Alcohol Use and Trauma Symptoms: Associations with Critical Incidents, Coping, and Social Stressors'. *International Journal of Stress Management* **20**(1): 37–56.

Maslow, A. H. (1970). *Motivation and Personality*. New York: Harper & Row.

Monnier, J., Cameron, R. P., Hobfoll, S. E., and Gribble, J. R. (2002). 'The Impact of Resource Loss and Critical Incidents on Psychological Functioning in Fire-Emergency Workers: A Pilot Study'. *International Journal of Stress Management* **9**(1): 11–29.

Morren, M., Dirkzwager, A. J. E., Kessels, F. J. M., and IJzermans, C. J. (2007). 'The Influence of a Disaster on the Health of Rescue Workers: A Longitudinal Study'. *Canadian Medical Association* **176**(9): 1279–1283.

Paton, D. (2005). 'Posttraumatic Growth in Protective Services Professionals: Individual, Cognitive and Organizational Influences'. *Traumatology* **11**(4): 335.

Patterson, G. T. (2003). 'Examining the Effects of Coping and Social Support on Work and Life Stress among Police Officers'. *Journal of Criminal Justice* **31**(3): 215–226.

Pisanti, R., van der Doef, M., Maes, S., Lazzari, D., and Bertini, M. (2011). 'Job Characteristics, Organizational Conditions, and Distress/Well-Being among Italian and Dutch Nurses: A Cross-National Comparison'. *International Journal of Nursing Studies* **48**(7): 829–837.

Prati, G., Pietrantoni, L., and Cicognani, E. (2010). 'Self-Efficacy Moderates the Relationship between Stress Appraisal and Quality of Life among Rescue Workers'. *Anxiety, Stress, Coping* **23**(4): 463–470.

Preacher, K. J. and Hayes, A. F. (2004). 'SPSS and SAS Procedures for Estimating Indirect Effects in Simple Mediation Models'. *Behavior Research Methods, Instruments, and Computers* **36**(4): 717–731.

Preacher, K. J. and Hayes, A. F. (2008). 'Asymptotic and Resampling Strategies for Assessing and Comparing Indirect Effects in Multiple Mediator Models'. *Behavior Research Methods* **40**(3): 879–891.

Rau, R. (2006). 'Learning Opportunities at Work as Predictor for Recovery and Health', *European Journal of Work and Organizational Psychology* **15**(2): 158–180.

Regehr, C., Hill, J., Knott, T., and Sault, B. (2003). 'Social Support, Self-Efficacy and Trauma in New Recruits and Experienced Firefighters'. *Stress and Health: Journal of the International Society for the Investigation of Stress* **19**(4): 189–193.

Rosner, R., and Powell, S. (2014). Posttraumatic Growth after War. In Calhoun, L. G and Tedeschi, R. G. (eds), *Handbook of Posttraumatic Growth: Research and Practice*. New York: Psychology Press, pp. 197–213.

Sanz-Vergel, A. I., Demerouti, E., Moreno-Jiménez, B., and Mayo, M. (2010). 'Work-Family Balance and Energy: A Day-Level Study on Recovery Conditions'. *Journal of Vocational Behavior* **76**, 118–130.

Shochet, I. M., Shakespeare-Finch, J., Craig, C. *et al.* (2011). 'The Development of the Promoting Resilient Officers (PRO) Program'. *Traumatology* **17**(4): 43–51.

Shreffler, K. M., Meadows, M. P., and Davis, K. D. (2011). 'Firefighting and Fathering: Work-Family Conflict, Parenting Stress and Satisfaction with Parenting and Child Behavior'. *Fathering* **9**(2): 169–188.

Slottje, P., Twisk, J. W. R., Smidt, N. *et al.* (2007). 'Health-Related Quality of Life of Firefighters and Police Officers 8, 5 Years after the Air Disaster in Amsterdam'. *Quality of Life Research* **16**(2): 239–252.

Sonnentag, S. and Zijlstra, F. R. H. (2006). 'After Work Is Done: Psychological Perspectives on Recovery from Work'. *European Journal of Work and Organisation Psychology* **15**(2): 129–138.

Sterud, T., Hem, E., Lau, B., and Ekeberg, Ø. (2011). 'A Comparison of General and Ambulance Specific Stressors: Predictors of Job Satisfaction and Health Problems in a Nationwide One-Year Follow-up Study of Norwegian Ambulance Personnel'. *Journal of Occupational and Toxicology Medicine* **6**(10): 1–9.

Tang, T. L. P. and Hammontree, M. L. (1992). 'The Effects of Hardiness, Police Stress, and Life Stress on Police Officers' Illness and Absenteeism'. *Public Personnel Management* **21**(4): 493–510.

Van der Kolk, B. A. (2015). *The Body Keeps the Score: Brain, Mind, and Body in the Healing of Trauma*. New York: Penguin Books.

van der Ploeg, E., and Kleber, R. J. (2003). 'Acute and Chronic Job Stressors among Ambulance Personnel: Predictors of Health Symptoms'. *Occupational and Environmental Medicine* **60**(1): 140–146.

van der Velden, P. G., Kleber, R. J., Grievink, L., and Yzermans, J. C. (2010). 'Confrontations with Aggression and Mental Health Problems in Police Officers: The Role of Organizational Stressors, Life-Events and Previous Mental Health Problems'. *Psychological Trauma: Theory, Research, Practice, and Policy* **2**(2): 135–144.

van der Velden, P. G., van Loon, P., *et al.* (2012). 'Mental Health Problems among Search and Rescue Workers Deployed in the Haïti Earthquake 2010: A Pre–Post Comparison'. *Psychiatry Research* **198**(1): 100–105.

Vila, B. (2006). 'Impact of Long Work Hours on Police Officers and the Communities They Serve', *American Journal of Industrial Medicine*, **49**(11): 972–980.

Violanti, J. M., Andrew, M. E., Burchfiel, C. M. *et al.* (2006). 'Posttraumatic Stress Symptoms and Subclinical Cardiovascular Disease in Police Officers'. *International Journal of Stress Management* **13**(4): 541.

Wagner, S. L., McFee, J. A., and Martin, C. A. (2010). 'Mental Health Implications of Fire Service Membership'. *Traumatology* **16**(2): 26–32.

Wang, Z., Inslicht, S., Metzler, T. *et al.* (2010). 'A Prospective Study of Predictors of Depression Symptoms in Police', *Psychiatry Research* **175**(3): 211–216.

Wierda-Boer, H., Gerris, J., Vermulst, A., Malinen, K., and Anderson, K. (2009). 'Combination Strategies and Work–Family Interference among Dual-Earner Couples in Finland, Germany, and The Netherlands'. *Community, Work & Family* **12**(2): 233–249.

Witmer, J. M. and Sweeney, T. J. (1992). 'A Holistic Model for Wellness and Prevention over the Life Span'. *Journal of Counseling & Development* **71**(2): 140–148.