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# Personality Traits and Coping Strategies for Contrasting the Occurrence of Traumatic Reactions in Emergency Rescuers

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Additional information is available at the end of the chapter

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## Abstract

We investigated personality traits, coping strategies, and social factors among emergency rescuers of three different catastrophic events that occurred in 2009 and 2013. These events were natural disasters, two of which were caused by human negligence. We used the cognitive interview (CI) protocol to interview witnesses and investigate their memory of the event. A qualitative analysis using the ATLAS.ti software was performed to subdivide the type of verbal production in the number of scenes recollected, negative emotions, vivid mental images, and self-experience of the event. All participants were also assessed using the Trauma Symptom Inventory for the presence of traumatic reactions at the time of the interview and tests (from December 2015 until January 2016) and 6 months before the interview to exclude the presence of further Traumatic job-related events. Personality traits (Big Five Questionnaire), coping strategies (Coping Inventory for Stressful Situations-Adult), and other social factors (the Post-Traumatic Growth Inventory) have been assessed. The aim of the study is to identify individual factors contributing to the development of post-traumatic stress disorder (PTSD) in emergency rescuers. We found that some personality traits, social factors, and specific cognitive strategies may act as protective factors to traumatic reactions.

**Keywords:** PTSD, traumatic events, coping style, personality traits, emergency rescuers

## 1. Introduction

In the early morning of 6 April 2009, a 6.9-Richter-magnitude earthquake struck L'Aquila (Abruzzo, Italy) and affected more than 45 towns and small villages, killing 309 people, injuring 1,600 people, and forcing more than 80,000 inhabitants to leave their homes. Police officers at the scene were among the first to assist in communicating to those trapped under the ruins and organizing rescue efforts in L'Aquila and the surrounding areas.

Two and a half months later, on 29 June 2009, a derailment of a freight train and subsequent fire in the railway station in Viareggio (Tuscany, Italy) occurred, which also involved a derailed wagon that crashed into a number of houses. A large area of Viareggio was damaged in the fires caused by the wagons, which were carrying liquefied petroleum and caused explosions. Thirty-three people were killed in the explosions and from collapsing houses. The deaths occurred at the time of the explosion and in the following days due to the severity of the injuries. Twenty-five people were injured, and 100 were left homeless. Police officers were among the first to intervene at the scene to secure the area and assist other rescuers.

Approximately 4 years later, on 28 July 2013, a coach with 48 people on board that was traveling to Naples from Telesse Terme following a pilgrimage hit several vehicles before breaching a barrier and falling down a 30-m slope near the town of Avellino (Campania, Italy). This coach crash is considered the country's worst road accident. Forty people died, and 10 were severely injured.

Disasters can strike at any time and place. First responders, such as police officers, are repeatedly exposed to traumatic events as part of their daily routine. A discussion on the seriousness of a traumatic experience, which can trigger post-traumatic stress reactions, is still active [1]. One question thus concerns when one can pass from acceptable reactions, though they are occasionally imbued with suffering, to reactions that have a greater psychopathological meaning.

Stress is a pervasive experience that occurs when one's perceived demands outweigh one's perceived resources [2]. Although low to moderate levels of acute stress can be adaptive, the accumulated effects of chronic exposure to stress can lead to negative outcomes, including exhaustion, cognitive dysfunction, avoidance behavior, poor health behaviors, depressive symptoms, and negative social relationships [3]. It must be emphasized that traumatic stress reactions can differ according to the experienced event: In cases of technological or natural disasters or major terrorist attacks, the tendency is to increase mutual contact and look for reassurance in others [4]. This is also in line with neuroimaging studies in which specific networks of brain areas underpin post-traumatic stress disorder (PTSD) after various traumatic events [5, 6].

Over 85% of emergency personnel involved in traumatic incidents have experienced a traumatic stress reaction at some point [7]. Events that are considered stressful include being shot at, being physically threatened, having one's family threatened, working with victims who have been badly beaten [8–10], and experiencing the death of a fellow officer and physical attacks [11, 12]. Collins and Gibbs [9] report that stressors that are most frequently identified

among police officers are most likely to involve organizational issues such as work demands, lack of control over the workload, lack of communication, and inadequate support. Several studies on first responders reported low levels of PTSD symptoms e.g., [13–18], although Levy-Gigi et al. [19] highlighted the hidden consequences of being repeatedly exposed to traumatic experiences. Specifically, the presence of an impaired reversal learning has emerged [20] in individuals who were not diagnosed with PTSD but were repeatedly exposed to traumatic events in the line of duty; these individuals fail to encode traumatic associations in the appropriate context [19]. Furthermore, Levy-Gigi and colleagues [19] found that the specific type of impairment may vary due to the function of the occupation; specifically, they observed differences between firefighters and crime-scene investigation police officers. One interpretation of these differences was related to the different roles that they play in an event. Generally speaking, these first responders arrive at the scene at different times: Firefighters arrive at the scene soon after the occurrence, followed by the police. Firefighters rescue people and properties, whereas the police collect and provide evidence that may be useful in court in the event of prosecution. For this reason, firefighters' actions result in immediate positive or negative feedback according to the severity of the event, but police actions do not immediately affect the event or its outcome [19]. Some studies suggest that these differences may have a role in self-perception and the subsequent development of PTSD symptoms [21].

Factors that mitigate post-traumatic stress or post-traumatic growth have not yet been established. In particular, individual differences in post-trauma outcomes and the way in which certain putative key workplace, social support, and coping variables may combine to influence these outcomes are still open to debate [22]. Coping with stress requires subjective appraisal and reappraisal of the situation [23].

The selection process for police officers includes a measurement of personality traits, and potential recruits undergo strict screening procedures prior to their acceptance into the department. Several studies empirically suggest the existence of a "police personality" [24, 25], hypothesizing that this personality is a dynamic process that is affected by life experiences and recognizes the extraordinary job experiences that are unique to police work (see [25]). Specifically, the police personality is a characteristic or a set of characteristics that are acquired by individuals after they become officers and are illustrative of the personality attributes possessed solely by police officers. These personality characteristics may be common to police officers but may not necessarily be exclusively so [25]. Personality traits are considered significant predictors of police performance [26–28], with higher levels of conscientiousness and lower levels of neuroticism identified as the most significant predictors of police membership and performance [28, 29]. In general, people who score high in conscientiousness have also been characterized by the use of active coping skills and refrain from the use of passive coping skills [30]. The term *coping* refers to cognitive and behavioral efforts that are used to manage specific external and/or internal demands that are appraised as stressful or exceeding one's personal resources [31]. Coping strategies may be either problem focused or emotion focused [32]. Problem-focused coping refers to responses that are aimed at directly altering or resolving a stressful situation, whereas emotion-focused coping refers to responses aimed at managing and regulating one's emotional reactions to the stressful situation [33]. In general,

problem-focused coping strategies are more useful than emotion-focused coping strategies [34, 35]. The ability to cope with stress is considered a crucial factor within police settings. Anshel [36] individuates poor coping skills as significant predictors of high-level stress in police work. Grubb et al.'s [37] findings suggested the existence of a "police personality/profile" and linked good coping skills with the tendency to use fewer maladaptive cognitive strategies to regulate their emotions and cope with stress.

In the present study, we investigated the role of personal traits and coping strategies in developing or being resilient to post-traumatic stress disorder as well as in predicting post-traumatic growth. For this reason, we interviewed police officers who responded to three different catastrophic events that occurred in 2009 and 2013. We asked the respondents to freely recall and imagine the event, as well as imagining that the perspective changed. We then analyzed the number of memories reported, emotions, and personal experiences as part of the three instructions in the modified cognitive interview (CI).

We also analyzed the three groups to investigate the differences related to the specific event in which they participated.

We hypothesized the following observations: (1) proactive coping strategies are seen more often than maladaptive strategies, and the type of coping style may be associated with the presence of trauma symptoms; (2) the observation of specific personality traits are not observed because of the homogeneous sample, that is, we compared police officers involved in different types of disasters but not different types of rescuers; and (3) differences are found only for L'Aquila earthquake event because only in this event did rescuers experience the stress of being both primary and secondary victims.

## 2. Method

### 2.1. Participants

We recruited 15 police officers (14 men). These officers ranged from 43 to 61 years old; their educational level ranged from 8 to 18 years of schooling; and the group comprised officers who were involved in three different catastrophic events (six police officers were involved in L'Aquila earthquake, four police officers were involved in the Viareggio train derailment, and five police officers were involved in the Avellino coach crash).

To exclude the presence of traumatic job-related events that occurred in the 6 months prior to the time of the testing, all participants completed the Trauma Symptom Inventory (TSI) ([38] Italian Version: [39]). We also asked them to complete the Maslach Burnout Inventory (MBI) ([40, 41]; Italian Version: [42]) to exclude the presence of burnout. None of the participants showed the presence of PTSD or burnout.

Furthermore, all participants completed an initial form that requested information about the respondents' age and level of education, gender, area of work, grade, training, supervisory responsibilities, partnership status and number of children, and length of time in the occupa-

tion. The confidentiality and anonymity of the data were emphasized. In **Tables 1** and **2**, the means and standard deviations of the respondents' information are shown.

Groups	Number of participants in the event	Age (years)	Education (years)	Professional experience (years)
L'Aquila earthquake	6	51.2 (6.8)	15 (2.74)	31 (7.75)
Viareggio derailment	4	53.3 (5.23)	13 (0)	30.5 (3.63)
Avellino coach crash	5	52.6 (5.64)	15 (2.97)	30.67 (4.98)

**Table 1.** Means and (standard deviations) are reported.

Participants	Other Traumatic events experienced	Coping strategies adopted during the event		Sleep disturbances	Reexperiencing (includes flashbacks, intrusive memories, dreams)	General health disorders	Habitual fatigue
		Task-oriented and emotional disengagement	Peer support				
AV01	Yes	Yes	No	Yes	Yes	Yes	Yes
AV02	Yes	Yes	Yes	No	Yes	No	No
AV03	Yes	Yes	Yes	Yes	Yes	No	No
AV04	Yes	Yes	Yes	No	No	No	No
AV05	No	Yes	Yes	Yes	No	No	Yes
VI01	Yes	Yes	No	No	No	Yes	Yes
VI02	Yes	Yes	Yes	No	Yes	No	No
VI03	Yes	Yes	No	Yes	Yes	No	Yes
VI04	Yes	Yes	Yes	No	No	No	No
AQ01	Yes	Yes	No	Yes	Yes	Yes	No
AQ02	No	Yes	No	Yes	Yes	Yes	No
AQ03	Yes	Yes	No	Yes	Yes	Yes	No
AQ04	Yes	Yes	No	Yes	Yes	Yes	No
AQ05	No	Yes	Yes	No	Yes	No	No
AQ06	Yes	Yes	Yes	Yes	Yes	No	Yes

**Table 2.** Information related to the traumatic event (presence/absence).

## 2.2. Measures

*Big Five Questionnaire (BFQ)* (Italian version: [43, 44]) is a 132-item self-reporting inventory in its original extended form and it is commonly used to assess personality traits. The BFQ is based on the five-factor model (FFM), a widely known theory that describes personality within five broad dimensions [45]. The five factors have been defined as openness to experience, conscientiousness, extraversion/vivaciousness, agreeableness, and emotional stability. The reliability of the five dimensions of the Italian version of the BFQ (Cronbach's alpha) is within the range of 0.73–0.90, while reliability of the 10 subdimensions ranges from 0.68 to 0.86.

The respondents indicate agreement with the extent to which each item describes them on a five-point scale, ranging from complete disagreement (1 = extremely false for me) to complete agreement (5 = extremely true for me).

*Coping Inventory for Stressful Situations-Adult (CISS)* ([46]; Italian Version: [47]). This is a self-reporting inventory composed of 48 items that investigated the way the respondents react in stressful and demanding situations. The CISS measures three types of coping styles: task-orientated, emotion-orientated, and avoidance coping. It also identifies two types of avoidance patterns: distraction and social diversion. In particular, (1) the task-oriented coping style involves active and offensive coping styles, stressing proactive responses to the stressors (e.g., "I focus on the problem and see how I can solve it"); (2) emotion-oriented coping style concerns coping styles directed at altering negative emotional responses to stressors, such as negative thinking (e.g., "My efforts will surely fail"), decreased self-confidence (e.g., "I cannot handle this problem") or poor self-image (e.g., "I am useless"); and (3) the avoidance coping style represents withdrawal behaviors and the redirection of personal resources toward different activities, such as sports and leisure time (e.g., "I buy something"). The Cronbach's alpha estimates for the CISS dimensions were good (emotion-oriented coping 0.82) or acceptable (task-oriented coping 0.75, outreach-oriented coping 0.72, treat oneself-oriented coping 0.72) [48].

The respondents were asked to rate each item on a five-point scale, ranging from (1) "not at all" to (5) "very much."

*The Post-Traumatic Growth Inventory (PTGI)* ([49]; Italian Version: [50]) measures the positive outcomes reported by people who have experienced traumatic events. This scale is composed of 21 self-statements including the components of new possibilities, relating to others, personal strength, spiritual change, and appreciation of life. The respondents were asked to indicate for each statement the degree to which the change listed occurred in his/her life as the result of the crisis on a six-point Likert scale, which ranged from 0 ("I did not experience this change as a result of my crisis") to 5 ("I experienced this change to very great degree as a result of my crisis"). The intermediate scores and the changes experienced were the following: 1, a very small degree of change experienced; 2, a small degree of change experienced; (3, a moderate degree of change experienced; and 4, a great degree of change experienced. At the beginning of the inventory, the respondents were given space to indicate the difficult life event that occurred (e.g., bereavement, injury-producing accidents, separation or divorce of parents, relationship break-up, criminal victimization, illness, retirement, disaster, vehicular accident,

and other events) and when it occurred. In the Italian version, the internal reliability of this instrument is Cronbach's alpha = 0.93, while the reliability of the five dimensions of the Italian version of the PTGI (Cronbach's alpha) is within the range of 0.42–0.73 [50].

*The Trauma Symptom Inventory (TSI).* The Italian version of the TSI [39] was a translation of the original questionnaire [38] with exactly the same item numbering.

The TSI includes 100 self-statements that are subdivided into 3 validity scales (inconsistent response, response level, and atypical response scales) and 10 clinical scales. The validity scales are designed to detect conflicting, underreporting and overreporting response sets, respectively [38]. The clinical scales measure the extent to which the responder endorses the four categories of distress. Specifically, anxious arousal (AA), depression (D), and anger/irritability (AI) represent the dysphoric mood states that are often encountered by those experiencing significant psychological trauma. The scales of intrusive experiences (IE), defensive avoidance (DA), and dissociation (DIS) are designed to measure the re-experiencing and avoidance symptoms of PTSD. The sexual concerns (SC) and dysfunctional sexual behavior (DSB) scales measure attitudes and feelings regarding sex as well as sexual problems, respectively. The impaired self-reference (ISR) and tension-reduction behavior (TRB) scales tap into difficulties with the self and affect regulation, including the outward behavior manifestations that are used to manage negative effects, such as self-mutilation [38]. The internal consistency reliabilities of the Italian version of the TSI ranged from 0.71 to 0.83 for the validity scales and from 0.70 to 0.90 for the clinical scales across the samples [39]. The respondents are asked to rate the items on a four-point Likert scale, with "0" representing no experience of the symptom and "3" representing frequent occurrences over the past 6 months.

*The Maslach Burnout Inventory (MBI)* ([40, 41]; Italian Version: [42]) measures the outcome of chronic stress. This scale is composed of 22 items that rated on a frequency and intensity scale and measures three dimensions: emotional exhaustion (EE), depersonalization (D), and personal accomplishment (PA). The Cronbach's alpha estimates for the Italian version of the MBI dimensions were 0.88 for EE, 0.70 for D, and 0.83 for PA [51]. The frequency scale ranges from 0 (never) to 6 (every day), while the intensity scale ranges from 1 (never) to 6 (very strong).

*Modified Cognitive Interview (CI) protocol for investigating the traumatic event.* We used three of the four techniques used to interview the eyewitnesses in the CI; we specifically considered the context reinstatement and asked them about free recall, mental images, and the changed perspective. We did not ask participants to perform the changed order, in which the interviewees are asked to report as many details as they could in reverse order, starting with the last scene remembered. We also asked participants about the presence/absence of other events that they considered traumatic and the most traumatic event they had ever experienced, coping strategies adopted during the event, the event aftermath, the presence/absence of sleep disorders, intrusive memories of the event, health disorders, and useful suggestions they would provide to select law enforcement recruits.

In general, the procedure for the CI involved several steps. The researchers first ensured that the participant was comfortable and then asked him/her to imagine into the mood he/she experienced during the event and concentrate (if needed, he/she could also close his/her eyes

for 10 s to think). Later, the researchers gave the participant the mental reinstatement of the context instruction to encourage him/her to report all information that he/she could accurately remember.

Specifically, the CI began with this recommendation: “I want that you tell me everything you can remember, every little detail you can remember, even if you think it is not important or if you are not sure about it.” Four different instructions were then given. (1) The “free recall” technique [52] asked the participants to report as many as details as they could to accurately recreate the scene. This technique has been shown to be one of the most valuable components of the CI (e.g., [53]). (2) We also modified the “image” technique because we asked the participants to report as many as details as they could regarding the first and the most emotionally impactful images of the event. (3) A modified “changed perspective” technique was used, in which we asked the participants to try to observe the scene above from a bird’s-eye view and report as many details as they could, in addition to the emotion experienced.

### 2.3. Coding and scoring

All CI were audio-recorded and transcribed verbatim. Later, the CIs were scored to evaluate each unit of information recalled by the participants. The units of information or details were categorized according to whether they were reported in the free recall, image, or changed perspective instructions. Two different coders (psychology post-doc students) scored the interviews; only when an agreement between them was reached were the audiotape details coded.

For all the three techniques, we extracted and analyzed the number of scenes recreated, negative emotions, vividness of mental images, and self-experiences. We also used ATLAS.ti for the analysis and coding of the interviews.

## 3. Statistical analyses

We performed a descriptive analysis concerning the demographic data for years of experience. We also reported the presence/absence of traumatic events experienced, the coping strategies adopted during the emergency, sleep disorders, intrusive memories of the event, and general health disorders (see **Table 2**).

To evaluate the factors that predict post-traumatic stress and the post-traumatic growth, we performed separate stepwise regression analyses loading personality traits and coping strategies as independent variables.

To examine the possible differences between the groups due to the exposure to the three different events, we performed an analysis of variance (ANOVA) with the group (Avellino, Viareggio, and L’Aquila) and the number of memories, emotions and experiences that emerged from the modified cognitive interview in the three different instructions sections (free recall, mental image, and changed perspective).

## 4. Results

### 4.1. Regression analyses

To evaluate the personality traits and coping strategies that predict the traumatic effects in a critical event, we performed separate stepwise regression analyses considering the scores of the CISS and the BFQ as the independent variables and the scores in TSI and PTGI as the dependent variables. None of the sociodemographic variables correlated with any of the dependent variables, hence we did not have to control for any in the regression model.

### 4.2. CISS vs. TSI

The stepwise regression analysis revealed a significant effect for the factor *emotion oriented* on TSI AA (*scale of dysphoric mood states*;  $\beta = 0.691$ ,  $t = 3.582$ ,  $p < 0.01$ ), TSI AI (*anger/irritability*;  $\beta = 0.716$ ,  $t = 3.836$ ,  $p < 0.01$ ), TSI DIS (*dissociation*;  $\beta = 0.786$ ,  $t = 4.763$ ,  $p < 0.001$ ), and TSI TRB (*tension-reduction behavior*;  $\beta = 0.611$ ,  $t = 2.889$ ,  $p < 0.05$ ).

### 4.3. BFQ vs. TSI

The stepwise regression revealed a significant effect only for the *emotional stability* factor of BFQ on TSI DIS (*dissociation*;  $\beta = -0.580$ ;  $t = 2.568$ ,  $p < 0.05$ ), and the *conscientiousness* factor on TSI TRB (*tension-reduction behavior*;  $\beta = -0.658$ ;  $t = 3.152$ ,  $p < 0.01$ ). No other factor was statistically significant.

### 4.4. CISS vs. PTGI

No CISS factors showed significant effects.

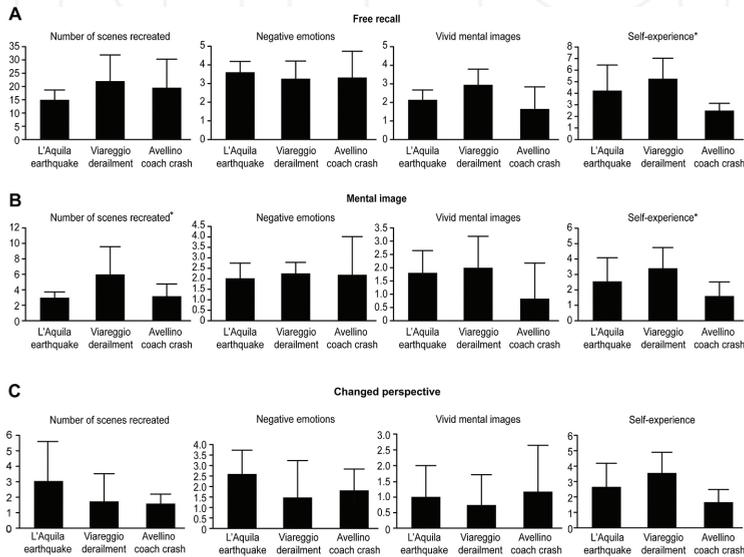
### 4.5. BFQ vs. PTGI

The stepwise regression performed on the PTGI scores showed a significant effect of *emotional stability* and *conscientiousness* as predictors of *new line possibilities* (respectively,  $\beta = -0.683$ ;  $t = -3.803$ ,  $p < 0.01$ , and  $\beta = 0.549$ ;  $t = 3.056$ ,  $p < 0.01$ ), the factors of *conscientiousness and extraversion/vivaciousness on personal strength growth* (respectively,  $\beta = 889$ ;  $t = 4.405$ ,  $p < 0.001$  and  $\beta = -530$ ;  $t = -2.653$ ,  $p < 0.05$ ). Finally, the *emotional stability* factor also showed a significant effect on *spiritual change* ( $\beta = -0.533$ ;  $t = 2.270$ ,  $p < 0.05$ ).

### 4.6. ANOVAs

To investigate the presence of significant differences between the three groups interviewed through CI, we performed separate ANOVAs for the three techniques (free recall, mental image, and change perspective) of the CI considering the group (*L'Aquila earthquake, Viareggio derailment, and Avellino coach crash*) as the independent variable and the verbal production in free recall/mental images and change perspective (number of scenes recreated, negative emotions, vividness of the mental image, and self-experience) as the dependent

variables. The statistical power is 0.06. Hence, all nonsignificant results from the ANOVA cannot be interpreted to avoid making type II errors. We however report them for transparency reasons only. From the ANOVA performed on the free recall, only a main effect of the group with respect to the self-experience was seen ( $F_{(2,14)} = 3.993$ ;  $p = 0.04$ ; see **Figure 1A**). All other differences were not significant most probably because of low power: the number of scenes recreated ( $F_{(2,14)} = 0.985$ ;  $p = 0.40$ ), negative emotions ( $F_{(2,14)} = 0.635$ ;  $p = 0.54$ ), and the vividness of mental images ( $F_{(2,14)} = 1.495$ ;  $p = 0.26$ ). In the mental image section, the three groups differed in terms of the self-experience reported ( $F_{(2,14)} = 3.993$ ;  $p < 0.05$ ) and of the number of scenes recreated ( $F_{(2,14)} = 5.48$ ;  $p = 0.02$ ), but the other types of verbal production differences were not significant most probably because of low power ( $F_{s(2,14)} =$  from 3.993 to 0.635;  $ps =$  n.s.; see **Figure 1B**). No significant differences emerged from the change perspective technique in the verbal production of the three groups ( $F_{s(2,14)} =$  from 1.919 to 0.181;  $ps =$  n.s.; see **Figure 1C**).



**Figure 1.** (A) Means of verbal production (number of scenes recreated, negative emotions, vividness of mental image, and self-experience) of the three groups in the free recall of CI; (B) means of verbal production (number of scenes recreated, negative emotions, vividness of mental image, and self-experience) of the three groups in the mental image of CI; (C) means of verbal production (number of scenes recreated, negative emotions, vividness of mental image, and self-experience) of the three groups in the change perspective of CI.

## 5. Discussion

Studies on traumatic reactions in first responders suggest that stress symptoms can continue over a significant period of time [54] and may include guilt, anxiety, depression, sleep distur-

bances, flashbacks (e.g., intrusive thoughts), and excessive anger [55]. This is one of the reasons we decided to investigate this aspect 3 and 7 years from the three different catastrophic events that occurred in Italy in which the police officers interviewed had an important role in the protection and preservation of life, property, and the environment. They were on the front lines of these three events, and they also worked hard in the aftermath, which lasted several months. In particular, in one of these disasters (i.e., L'Aquila), the long-lasting effects of the traumatic experience are currently manifested mainly by feeling "on edge" in addition to with hyperarousal and sleeping problems. Indeed, we observed significant differences between the self-experience and the number of scenes recreated by the police officers who responded. Both in the L'Aquila earthquake and in the Viareggio derailment, the first-responders were exposed to hazardous environmental conditions. In the L'Aquila event, the main shock (Richter magnitude 6.9) was followed by several thousands of aftershocks (30 of which had a Richter magnitude of greater than 3.5), which made the rescue difficult. Conversely, in the Viareggio train derailment, there was the tangible risk of further wagon explosions due to the high temperature emitted by the first wagon transporting liquefied petroleum gas (LPG) that had already exploded and destroyed houses alongside the railway line. Separately, in the Avellino coach crash, the first police officers arrived at the crash epicenter without knowing the severity of the situation because the initial information received from the operations room was not alarming. In some cases, the officers were able to rescue injured people in the upper part of the viaduct but were unable to reach the people trapped in the crashed coach approximately 100 ft under the viaduct.

Furthermore, only in L'Aquila earthquake scenario did the double condition of the victims (i.e., all lived in L'Aquila and in the earthquake-affected areas) and rescuers emerge. Indeed, the L'Aquila interviews are characterized by the reenactment of the rescue experiences that occurred later; many operators were at home with their families during the earthquake. As is well-known, police officers consider situations in which their own family is threatened especially stressful [10]. During the interview, their concerns for the safety of their families, friends, and peers who were not in the line of duty at the time of the earthquake emerged frequently. Moreover, all experienced the death of a fellow officer due to the collapse of the officer's house. This double experience as victims and rescuers in this group produced self-experiences that were significantly different from those produced in the other groups. Although the sample observed is small and the result must be considered with caution, we maintain that it may provide some useful guidelines for emergency rescuers in long-term stress management when rescuers have the double role of being direct and indirect victims.

Concerning the absence of significant difference in negative emotions and the vividness of the mental images recalled, no conclusions or explanations can be drawn because of the lack of statistical power.

Although the three groups are different in their experiences, all participants have been exposed to a traumatic experience, and 12 out of 15 participants reported other traumatic experience related to their job activity. Among the most traumatic experiences on the job included fatal accidents involving children or adolescents and self-perceived errors in death notifications. According to Colwell et al. [56], these types of traumatic experiences are reported in 27.2 and

1.3% of their sample, respectively, and in some way can be considered part of the risk of the job.

We found interesting results when investigating personality traits and coping strategies with respect to TSI and post-traumatic growth.

Specifically, we found that some coping strategies, such as emotion-oriented ones, predict the result in some TSI scales. In particular, emotion-oriented strategies predict performance with respect to the anxious/arousal scale, a scale of dysphoric mood states; the anger/irritability scale, a scale strictly related to the experience of psychological trauma; dissociation, a scale concerns the reexperiencing of the traumatic event; and tension-reduction behavior, a scale that examines difficulties with oneself and affects regulation.

Generally speaking, emotion-oriented strategies are considered proactive, and studies on coping associate these strategies with better adjustment, higher self-rated coping effectiveness, and lower levels of depression (e.g., [57, 58]). Indeed, when an individual adopts this type of coping style, he/she contrasts negative emotional responses with the stressors. Considering the time from the traumatic event (3 or 7 years), this type of coping strategy is surely more functional than problem-focused strategies, which were used by all rescuers during the emergency, as reported from the CI. Folkman and Lazarus [59], in introducing the functions of coping strategies, highlight that individuals use these strategies to manage problems causing stress and to govern emotions relating to the stressors. In the light of this definition, several studies consider a situation stressful whenever the individual perceives a lower ability to cope with the situation. Furthermore, the adopted coping strategies are strictly related to the way in which a stressor is evaluated, which means that a stressor that is perceived as controllable tends to elicit more proactive coping mechanisms [60], while a stressor perceived as uncontrollable tends to elicit more avoidance strategies (e.g., [2, 61]).

The few studies on coping strategies among police officers seem to suggest that police officers have the tendency to use maladaptive emotion-focused behaviors for immediate stress reduction (e.g., [62]), while the avoidance coping strategy been more frequently associated with psychological stress [63]. In contrast, Ortega and colleagues [64] found that only personality and tenure were significantly related to coping strategy and the management of the occupational stress. In a recent study, Grubb et al. [37] found that the UK police officers use fewer maladaptive cognitive strategies to regulate their emotions and cope with stress, suggesting that they are adept at avoiding strategies that are negative and dysfunctional. Here, we found that only proactive coping strategies allowed the respondents to cope with the traumatic experience. We also found that only emotional stability for personality traits is a predictor of dissociation as evaluated by the TSI scales; this is in line with the proactive emotional coping strategies used in this research. Moreover, the conscientiousness of personality traits predicts the tension-reduction behaviors of TSI.

Another interesting result was that personality traits predict post-traumatic growth. In particular, we found that emotional stability and conscientiousness predicts new line possibilities; the conscientiousness and extraversion/energetic factor predict personal strength growth (specifically, extraversion/vivaciousness predicts growth in the negative direction);

and emotional stability predicts spiritual changes. These findings are of interest because the process of healing may consume mental and emotional energy, which could explain the negative prediction of the extraversion/vivaciousness trait. Indeed, people with a tendency toward being energetic may experience the reduction of the available resources more than others. Conversely, emotional stability may help in the building of new relationships and consolidating strong personal ties. In the same direction, individuals with conscientiousness traits are well organized, methodical, and thorough; this trait fosters the growth of personal strength as well as new life possibilities.

Our results seem to suggest that in the coping process, the traumatic event is important, both in terms of personality and methods of coping with the event. In some ways, coping strategies have an important function in protecting the individual and promoting his/her resilience. Personality has an important role in the meaning that the individual gives to his/her post-traumatic life and his/her capability to cope with the trauma. This is an important result that takes into account the fact that police officers, as a consequence of their job, are not able to avoid future situations that are similar to the traumatic event or other potentially traumatic events. In this sense, they may be vulnerable to re-victimization; moreover, the exposure to new stressors may make spontaneous recovery more demanding because they would overburden an already overloaded system [11, 36]. For this reason, a goal of future studies should be to better investigate the role of all protective factors that may help rescuers in terms of resiliency and enhancing their capability for post-traumatic growth.

In conclusion, we believe that our results—above all, those related to the role of emotional coping strategies as a protective factor in the prevention of post-traumatic stress disorders—may have important implications in terms of training new police officers. Indeed, preventive measures could be implemented to enhance the adaptive and proactive coping strategies in the management of stress. The evidence that personality traits may play an important role in not developing traumatic symptoms as well as in positive post-traumatic growth is information of interest that may have an impact in terms of recruitment. Furthermore, the use of structured cognitive interviews for investigating traumatic events could become a useful tool for supporting and reducing stress reactions. Moreover, one of the innovations of this study is related to the long amount of time that elapsed from the traumatic event exposure and the structured cognitive interviews. For example, a previous study by Marchand et al. [65] involved interviews of police officers at between 5 and 15 days and at 1 month, 3 months, and 12 months after the event. Our study is the first to investigate the psychological long-term effects of the exposure to a traumatic experience. From this perspective, the data in this study show that emotion-coping strategies and some positive emotional and mental personality traits appear to be beneficial for police officers. In this vein, our study suggests that through a modified cognitive interview, veteran police officers may share their experiences with cadets during academic training to help them avoid being overwhelmed from unexpected emotions and job-related experience.

It is also important to highlight that, even if our sample is small, which can be perceived as a limitation, interviewing police officers about a severe traumatic event may be very difficult because they are often prone to underestimating the magnitude of their distress. Moreover,

the events investigated occurred several years ago, and the rescuers who intervened at that time are now at different police stations throughout Italy. However, we managed to interview all police officers who intervened as first rescuers who are now retired; all participants understood the implications of their contributions in terms of the academic training of cadets. This collective participation should be more appreciated in consideration of the “virility” culture [66], which prevents officers from expressing their emotions and feelings. This culture can force police officers into the role of superheroes, an idea that is supported by both the citizens and the police officers themselves. “Virility” can be considered a defensive mechanism strategy and may have an important role in protecting police officers from a high level of anxiety that could prevent them from doing their job. The embodiment of the “virility” culture does not allow displays of weakness and traumatic reactions. To offset risk, police officers can become risk takers. Police officers are generally perceived by citizens as superheroes and they, in line with this image, attempt to not fail such expectations by displaying “weaknesses” such as traumatic reactions or the long-term effects of trauma. For this reason, they generally never show any effects of the trauma exposure and tend to minimize their distress.

The participation of policemen in this study is a signal that knowledge and scientific results are changing the minds and culture in the direction of more effective attitudes toward the prevention and promotion of health.

## **6. Conclusion**

The present study shows that emotion-coping strategies and some positive emotional and mental personality traits appear to play an important role as a protective factor for the development of post-traumatic stress disorder, as well as for the post-traumatic growth.

Moreover, it explores the possibility to use a modified cognitive interview to allow veteran police officers to share their experiences with cadets during academic training to help them avoid being overwhelmed from unexpected emotions and job-related experience. In spite of its limitations (the small number of participants for traumatic event and lack of statistical power for some analyses), the results seem to suggest the importance to use systematic measurements of coping strategies adopted as well as debriefing in the immediate aftermath (for small and large emergencies) and over the course of the following years (for large emergencies).

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