



## The Relationship between Individual Coping Styles, Reported Levels of Resilience and Self-Blame Cognitions as Predictors of Post-Traumatic Stress Disorder Symptoms

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### Abstract

**Objective:** Previous research has shown that coping styles, resilience and self-blame cognitions have predicted the experience of post-traumatic stress disorder (PTSD). However no previous research has examined these variables in conjunction before. Therefore, the aim of this present study was to examine the relationship between coping styles, resilience and self-blame cognitions to post-traumatic stress disorder (PTSD) symptoms, to identify the strongest predictor in a mixed adult trauma sample. Age, gender and length of time since the traumatic event was also included in the study, as past research has indicated these variables have also predicted PTSD symptoms.

**Method:** A sample of 87 participants who identified they had experienced a traumatic event took part. A cross-sectional design was used and measures were administered online. Participants completed self-report measures on coping styles, resilience, self-blame cognitions and PTSD symptoms. Demographic information was collected.

**Results:** Multiple regression analyses identified maladaptive coping was the only significant predictor of PTSD symptoms. Maladaptive coping accounted for 45.6% of the variance in scores. No other significant predictors were found.

**Conclusion:** The findings suggest there is a relationship between maladaptive coping style and PTSD symptoms in adults who have experienced a traumatic event. Maladaptive coping increases PTSD symptoms, and this study has found maladaptive coping appears to be a particular strong predictor in predicting PTSD symptoms. It appears maladaptive coping should be targeted during interventions. Further research is needed into exploring the specific types of traumatic events, and potential factors predicting PTSD symptoms depending on the nature of the traumatic event.

### Keywords

Post-traumatic stress disorder; PTSD; Coping styles; Resilience; Self-blame cognitions

### Introduction

How individuals react to traumatic events varies considerably, and many individuals experience symptoms of Post-traumatic stress disorder (PTSD), immediately after experiencing a traumatic event [1]. A large proportion of such individuals appear to “recover” from their event, however for some individuals the symptoms can continue for years [2]. These individuals can seek treatment, including psychological treatments [1].

The Diagnostic and Statistical Manual of Psychiatric Disorders, Fifth edition (DSM-5) states, PTSD can be an outcome of experiencing a psychological traumatic event leading to significant impairment across different areas of functioning [3]. Examples of such events include exposure to actual or threatened death, sexual violence or serious injury [3]. To be diagnosed with PTSD requires the following symptoms; involuntary re-experiencing, hyperarousal, emotional numbing and avoidance and negative alterations in cognition and mood to be present for more than a month after the event [3]. A proportion of individuals exposed to a traumatic event develops PTSD, however most do not. The majority of people adapt quickly and recover successfully following the traumatic event [4]. Less successful adaptation to events has drawn lots of attention, and predictors of PTSD has been considerably researched [4].

Reactions to traumatic events became a clinical priority in the United Kingdom (UK) in the 1980's, after a number of community traumatic events e.g. Bradford football stadium fire. Difficulties facing the UK have included supporting services locally to ensure they are equipped to treat large numbers of people with PTSD. Recently this has been achieved to some degree with the introduction of a range of NHS provisions, however such provisions still vary [5]. Social and welfare costs claims regarding severe disablement because of stress and PTSD in 2003-4 were £103 million, an increase of £55 million claimed five years previously. As a result, PTSD has produced a significant economic burden to the National Health Service (NHS) [6]. The effects of PTSD extend beyond the NHS, and affects quality of life and an individual's ability to function. The economic burden is felt by families and the wider society [7].

The first epidemiological research into trauma exposure used the DSM-III criteria and was carried out in America. The study included 1007 adults and results showed 31.9% of the sample had been exposed to traumatic events, with a lifetime prevalence rate of 9.2% [8]. The Fundamental Facts about Mental Health (2016), stated 31.15% of men, and 31.2% of women in England has experienced at least one traumatic event. Only 12.8% of individuals had been diagnosed by a professional, and less than half of individuals diagnosed (47.9%) were receiving treatment for their mental health [9].

### Demographic Factors

Several demographic factors have been associated with the risk of developing PTSD symptoms including age and in particular gender [10-14]. Consistently research shows women are more likely to develop PTSD [4,15]. A meta-analysis showed women were at a higher risk for developing PTSD in civilian populations [10]. Length of time since the individual has experienced the traumatic event has

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also been shown to be a risk factor for developing PTSD symptoms, with less time since the event predicting such symptoms [16].

## Psychological Factors

A number of psychological factors have been associated with the disorder, including beliefs, coping strategies and cognitive-affective reactions. Research has suggested some of the strongest predictors of PTSD relate to psychosocial factors involved in the experiencing of and adaptation to the traumatic event [10,17-19]. Cognitive models of PTSD have described psychological factors involved in the development and persistence of PTSD symptoms including appraisals, beliefs and coping strategies [1]. Previous research and the resulting models used to understand PTSD symptoms suggest resilience, self-blame and coping styles are particularly important factors when understanding both successful and problematic adaptation to traumatic experiences. These factors will now be explored in more detail.

## Resilience

Resilience has been defined as “the ability to come back from adversity, and positively adapt to change” [20]. Resilience has also been defined as the ability to “bounce back” or show better than expected functioning after a negative life event [21]. There are several terms associated with resilience in the literature including “hardiness”, “courage” and “optimism” [20,22]. Resilience is not simply the opposite of psychopathological vulnerability; rather it is now viewed as a separate concept which can be improved [23].

A resiliency model has been presented in response to trauma [24]. This model stipulates dynamic variables interacting when an individual experiences a traumatic event, and this interaction determines resilient behaviour [25]. This model is integrative and identifies interactions among several variables, and how these variables can work together to create a range of adaptive behaviours and degrees of resiliency after experiencing a traumatic event [25]. Traumatic events can influence cognitive schemas of the self and pre-existing personality including its structure, defences and ego processes [25]. Such events activate allostatic stress response patterns, which manages human stress responses. The activation of response patterns includes different areas of functioning e.g. affect modulation and utilisation of protective factors [26]. How some individuals respond after experiencing trauma is on a continuum of adaptation and resilience. At the positive end of the continuum are individuals who show optimal coping and can keep a positive outlook from their experience [25].

Researchers have found less resilient individuals have reported more PTSD symptoms [27]. It is possible that individuals who are affected by post-traumatic symptoms may at the same time see themselves as less resilient. This perception is consistent with negative self-schemas held by individuals with PTSD symptoms [27]. Researchers have reported resiliency levels have predicted PTSD symptoms in different populations, and in particular war veterans [14,28-31]. Components of resiliency have been found to be negatively associated with symptom severity in a sample of war veterans [32]. The significance of resilience has now been acknowledged by the Military, and the United States Army programme incorporates a Comprehensive Soldier Fitness (CSF) designed specially to boost resiliency [33]. The results of the CSF can be used by clinicians to teach individuals strategies to enhance resilience, and having these strategies may result in fewer PTSD symptoms [31]. Research into

resiliency-strengthening interventions has shown some promising success [34].

In terms of clinical practice resilience is now incorporated into models of well-being, and has moved from historical models of ill health. This recent shift to models of wellness and resilience enhancing models has started to inform government public health policy, and highlight preventative strategies [35,36]. The literature regarding PTSD and resilience suggests following traumatic experience resilience can be learnt [25]. Furthermore, resilience has been defined as “modifiable”, and can increase with appropriate interventions [37].

The results of previous research show resilience can predict PTSD symptoms [27,29,31]. Therefore, improving an individual’s level of resilience could reduce mental health effects, and it has been suggested resiliency can be taught and then improved [20]. Interventions using cognitive and behavioural techniques have been shown to help improve and develop resiliency [20,38]. Providing these types of interventions could help to prevent or reduce psychological symptoms of the trauma related experiences [20]. Resilience is clearly an important factor in the adaptation of individuals to traumatic events. It is becoming an increasing focus for intervention. The current study aims to refine understanding of the role played by resilience in researching its ability to predict PTSD symptoms, and examining the strength of resilience when predicting PTSD symptoms alongside other variables shown to predict PTSD symptoms.

## Self-Blame

Self-blame can be defined as the belief about causality, where an individual perceives they are responsible for the event leading to “self-criticism” and appraisals of low “self-worth” [39]. As stated above negative self-schemas can influence PTSD symptoms experienced by individuals [38]. Schemas held by individuals who have experienced a traumatic event can include information about the type of causal attributions offered for traumatic life events [40]. These perceptions around causal attributions have been identified as a potential vulnerability factor for PTSD [41].

PTSD theories have highlighted the significance of cognitive distortions including self-blame in the development and maintenance of the disorder [1]. A cognitive model that offers one of the most detailed theories regarding the maintenance and treatment of PTSD has been presented widely in the PTSD literature [17]. This model [1], suggests when individuals process the traumatic information in a way that creates a continual sense of threat, pathological responses can arise. A mechanism contributing to this sense of threat includes negative appraisals relating to the trauma or its sequelae [17].

Several appraisals can create the perception of threat, including the way an individual perceives they have behaved during the event [1]. Such appraisals can have serious implications, especially if they are of a self-blaming nature e.g. “I deserve that bad things happen to me” [17]. Other people involved in the victim’s life can be uncertain regarding how they should respond to the individual, and may believe not talking about the event will help to prevent further distress [1]. However, this lack of discussion could be interpreted by the victim that others believe they were to blame, which is likely to produce PTSD symptoms [1].

Previous studies have shown after experiencing a traumatic event; PTSD severity can be predicted by cognitive distortions [42,43]. Negative appraisals about the event can be intrusive leading to a vicious cycle where trauma related thoughts and emotions are

suppressed. This could increase cognitive intrusions relating to the traumatic event, and could intensify emotional distress [44]. Several researchers have reported that they found that self-blame cognitions predicted PTSD symptoms [45-49].

The clinical implications of the findings regarding self-blame provide numerous ideas for future research [50]. In particular, if the relationship between maladaptive cognitions and negative emotions was researched, a greater understanding could be developed to improve interventions targeting self-blame given the significant effect of this cognition including the significant effect self-blame can have on victim's adjustment post trauma [50,51]. Even though specific interventions have been developed focussing on trauma-related guilt [52], less attention has been placed on how to provide effective interventions for individuals with self-blame cognitions who have experienced, in particular, interpersonal traumas. As dysfunctional cognitions can be addressed with cognitive processing therapy and cognitive restructuring, research may indicate such therapies need to focus on self-blame [53]. There is a need for continual understanding of self-blame cognitions to develop treatment interventions for individuals with PTSD difficulties [50].

However, there remain some inconsistencies in the research regarding the effect self-blame cognitions have on PTSD symptomology, and some research with stroke victims found self-blame cognitions did not significantly predict PTSD symptoms [54]. Previous research appears to focus on a specific type of traumatic event, which may influence the effect self-blame cognitions have on PTSD symptomatology within different samples. In summary, self-schemas are important in understanding the impact of traumatic events, and self-blame appears to be a promising focus for intervention. However, the relationship remains unclear, and the current study aims to identify if there is a relationship between self-blame cognitions and PTSD symptomology in a non-specified trauma population.

## Coping Styles

Coping has been defined as a process where an individual tries to manage the demands placed upon them by stressful events. Such events are thought to be those surpassing an individual's personal resources [55]. Coping has also been defined as cognitive, affective or behavioural strategies some individual uses to manage stress generated by an experience [56].

Coping styles used after a traumatic event can influence the experience of post-traumatic symptoms. Regarding psychological adjustment they are an important part of this process, and can help to regulate symptoms experienced due to the trauma [57]. Coping styles can differ in their effectiveness, and can either increase or decrease the effects of experiencing a traumatic event [57]. Differences in coping skills of individuals who have experienced trauma can be important regarding the development, maintenance and treatment of PTSD symptoms [58].

A model of PTSD suggests PTSD symptoms can be maintained by maladaptive - avoidance based coping styles [1]. When individuals perceive a sense of threat, they can use a range of such strategies to try and control the threat [1]. Such strategies are linked with appraisals the individual's holds regarding the event/sequelae, and their beliefs about how to cope with the trauma [1]. This model states how the disorder can be maintained through maladaptive behavioural coping strategies, and these strategies include thought suppression and distraction to control symptoms [17]. Negative appraisals about

the event or its sequelae are then unable to change due to these maladaptive coping strategies. This model has stated how cognitions and coping factors can impact on PTSD, and these elements have been reliably supported by empirical research [17].

Researchers have suggested that one of the main psychological processes accountable for the maintenance and development of PTSD symptoms is experiential avoidance [59]. Treatments for PTSD try to target experiential avoidance through "re-living" the trauma. However due to the nature of the difficulties associated with PTSD, individuals can often be reluctant or unable to "re-live" such traumatic memories [60]. It is therefore argued PTSD treatments need to be developed to make them more bearable [61]. Researchers have found that only 20% of individuals were able to engage in exposure treatments [62]. Therefore, it appears apparent a key focus of effective interventions would be to support individuals to develop their coping skills in the face of trauma.

Due to the apparent importance of coping in the PTSD literature, several studies have researched the ability of coping styles to predict PTSD symptoms. A number of studies have reported how coping styles have predicted PTSD symptoms after individuals have experienced a range of traumatic events including sexual abuse, natural disasters, physical health conditions, rescue/emergency work, birth trauma and motor vehicle accidents [4,63-67]. Currently many different coping measures exist, and several coping style taxonomies have been suggested [68]. Two of these taxonomies include maladaptive and adaptive coping styles [69].

Maladaptive coping strategies are cognitive and behavioural strategies individuals use to reduce distress, however such strategies do not target the basis of the distress itself [63]. Such strategies include cognitive and behavioural disengagement, denial and substance misuse. These strategies are used to cope with the distress after experiencing a traumatic event, and can maintain the psychological symptoms of PTSD [70]. Maladaptive strategies immediately after the traumatic event can be protective, as they can protect the individual from the reality of their experience. However in the longer term these strategies can inhibit recovery as to recover from such an event individuals need to cope with the event itself, and its effects [63]. Several studies report that maladaptive coping strategies have predicted PTSD symptoms [71-73].

Adaptive coping can be defined as successful strategies and include cognitive restructuring, expressing emotions and seeking social support. Such strategies can be viewed as a protective factor against symptoms of PTSD [63]. Improved recovery is associated with such strategies, and a decrease in PTSD symptoms [74]. An adaptive method such as acceptance is an adaptive strategy which helps to reduce any individual difficulties *via* positive reframing, and having an optimistic view [75]. Researchers have reported that adaptive coping strategies have predict fewer PTSD symptoms [64,76,77].

Clinically coping has been shown to be an important factor to address in therapy, and research has suggested clinicians need to address possible effects of learnt coping strategies, reducing the reliance on maladaptive strategies and improving adaptive coping strategies [78-80]. However some researchers have found adaptive coping does not predict PTSD symptoms [81]. Whilst there appears to be a consistent and clear picture regarding the role of maladaptive coping strategies, the research on PTSD symptoms and the role of adaptive coping is mixed. The present study aims to address this inconclusiveness.

## Present Study

The research findings stated above have highlighted all the variables have been shown to predict PTSD symptoms independently, although there remains the need for clarification in some cases. Moreover, there appears to be no research that has studied the different variables in conjunction, with one another. Therefore, there is a rationale and clinical need to combine these factors in a multiple regression study to explore their possible effect and establish which factors are the strongest predictors within a general trauma population. This is the principle aim and unique element of the research, to identify which are the significant and strongest predictors of PTSD symptomology. Therefore, the present study aims to explore the relationship between self-blame cognitions, levels of resilience and coping styles as predictors of PTSD symptomatology, in a sample of individuals in the general population who have experienced a traumatic event. Based on past research age, gender and length of time since the traumatic event was also included to see what impact they may have, and to see if these variables predicted PTSD symptoms.

The following specific research question will be addressed:

1. Which variables are shown to be the strongest predictor of PTSD symptomology?

It is hypothesised that:

2. Maladaptive coping styles, adaptive coping styles, resilience and self-blame cognitions will predict PTSD symptoms.

3. More maladaptive coping, less adaptive coping, more self-blame cognitions and lower levels of resilience will predict higher levels of PTSD symptomology.

4. Age, gender and length of time since the traumatic event will predict PTSD symptomology.

## Materials and Method

### Design

A cross sectional design using internet mediated research (IMR), was used to quantitatively explore the relationship between age, gender, length of time since the traumatic event, coping styles, resilience and self-blame cognitions as predictors of PTSD symptoms using multiple regression analysis.

### Participants

In order to identify the sample size needed for the multiple regression analysis a power analysis was completed for this study. With seven variables, a G\* power calculator was used [82] to determine the sample size. With power set at 0.8 [83], and significance at 0.5, for a medium effect size (0.15) 103 participants were required. Other cross-sectional research looking at PTSD symptoms have used similar sample sizes to this study [84]. This study recruited 87 participants meaning this study is slightly underpowered.

Participants were recruited from the social media site Facebook. The research was advertised in the form of a short post followed by a link advertised on the principle investigators research page. The link was made available for other Facebook users to share. Crowdsourcing was used to share the link, with the principle investigator also sharing the link on other Facebook pages or groups where permission had been sought from an administrative representative. A sample of 87 participants were recruited to participate, and 408 individuals

accessed the link meaning 21.3% of individuals who accessed the link completed the questionnaires. 65 participants were women (74.7%), and 22 were men (25.3%). In order to participate in the study participants had to be aged eighteen or above with no upper age limit, and the mean age for the sample was 38.8 (SD=11.4, range 18-66). Participants had to be literate and fluent in English, had experienced a traumatic event/events from the qualifying list of events taken from the DSM-5 [3], and needed to be residing in the UK. Six participants did not record the nature of their traumatic event. Participants were excluded if they were currently or have previously engaged in psychology therapy related to their trauma difficulties.

### Measures

#### Brief Cope – (Carver et al. [85])

The Brief Cope was developed from the full length COPE Inventory [85] and is a 28 item self-report scale with fourteen subscales. The scales include: (1) Active Coping, (2) Planning, (3), Positive Reframing, (4), Acceptance, (5) Humour, (6) Religion, (7) Using Emotional Support, (8) Using Instrumental Support, (9) Self-Distraction, (10) Denial, (11) Venting, (12) Substance Use, (13) Behavioural Disengagement, and (14) Self-Blame. The subscales 1–8 can be combined to give totals for adaptive coping, and subscales 9–14 can be combined to give totals for maladaptive coping [86]. Previous research supports the validity of adaptive and maladaptive coping [87]. The measure is designed to assess the varying coping strategies used by individuals in response to certain situations [88]. The measure uses a 4-point Likert scale (1= “I haven’t been doing this at all to”) to (4= “I’ve been doing this a lot”). Total scores on each of the scales are calculated by summing the appropriate items for each scale. It has been reported the scale has good internal consistency, and Cronbach’s alphas ranging from .50 to .90, and .81 to .87 [86,63].

#### Posttraumatic cognitions inventory (PTCI; Foa et al. [89])

This inventory is designed to measure trauma-related thoughts and beliefs [89]. This 36-item self-report measure contains three subscales: Negative Thoughts about the Self, Negative Thoughts about the World and Self-Blame. Participants indicate on a 7-point Likert scale the extent to which various statements are representative of their thinking (1=totally disagree to 7=totally agree). Responses are anchored to a specific traumatic experience. The subscales of the PTCI have good internal reliability, with Cronbach’s alphas of .97 for Negative Thoughts about the Self, .88 for Negative Thoughts about the World and .86 for Self-Blame [89]. The self-blame subscale (5 items) was used in the current study, based on the factor loadings reported by [89]. Previous research has also used the self-blame subscale [90].

#### Connor-Davidson resilience scale (CD-RISC; Connor and Davidson [37])

The CD-RISC is designed to measure resilience, as a function of successful stress coping ability. Participants indicate on a 5-point Likert scale the extent to which various statements are true of themselves (0=“not at all true” to 4=“true nearly all of the time”). Respondents are asked to think and rate the items in relation to the past month, and with higher scores indicating greater resilience. This 25-item self-report measure contains four subscales, and yields a total score that will be used for the purpose of this study. The scale has been found to have good internal reliability, with Cronbach’s alphas of .98, for positive acceptance of change, .89 for tolerance of negative affect, .98 for belief in fate, .93 for availability of secure relationships, and .99 for the total scale [37].

**Impact of event scale – revised (IES-R; Weiss and Marmar [93])**

The IES-R is a 22 item-self report scale and is designed to measure PTSD symptomology. The measure is not for diagnosing PTSD, but it is an appropriate instrument measuring the subjective response to a specific traumatic event in an adult population [91]. The IES-R is a revised version of the original Impact of Events Scale [92], and the IES-R has added a third cluster of symptoms, hyperarousal to the avoidance and intrusion subscales [93]. Scores on the IES - R range from 0-88, with no cut off score. Research does however suggest thresholds ranging from 22 to 33 could indicate significant levels of distress [94]. Participants indicate on a 5-point Likert scale how distressing or difficult each item has been in the past seven days (0=“not at all” to 4=“extremely”). The scale provides a total score and has three subscales: intrusion, avoidance and hyperarousal. The scale has high internal reliability, with Cronbach’s alpha of .95, for the total scale, .90 for intrusion, .86 for avoidance, and .85 for hyperarousal [95].

**Procedure**

Ethical approval for this study was sought and gained from Staffordshire University’s Health Sciences ethics panel. Facebook the social media site was used to recruit participants through advertisements on the social medial site. These advertisements were in the form of a short post, and within these short post contained a URL link to an internet-based survey hosted by an online survey software programme named Qualtrics. These short posts detailed the nature and inclusion criteria for the study. The questionnaires took around 10-15 min to complete, and participants were regularly informed regarding the data collection period. Upon visiting the website, participants were presented with the list of qualifying traumatic events for this study, followed by the participant information sheet. This information sheet provided all the relevant details enabling the participant to decide if they wanted to participate, alongside a list of sources of support. After reading the information sheet the individual proceeded to a demographic information sheet, where the individual was asked to provide their age, gender and date they experienced their traumatic event. If an individual had experienced more than one traumatic event, they were asked to record the date of the event they considered being the most traumatic. The participants were then presented with the four questionnaires relating to PTSD symptoms, coping styles, resilience and self-blame cognitions. If participants had experienced more than one traumatic event they were asked to

complete the IES-R, Brief Cope and the PTCI in relation to the event they found the most traumatic. After completing the questionnaires the participant information sheet was presented again to the participants, in case they need to make note of any relevant email addresses or contact details. All responses were anonymous, and the participants were given the opportunity to contact the principle investigator to request a participant information sheet for them to retain if desired.

**Statistical analysis**

SPSS Statistics software (version 24) for Windows [96] was used to analyse the data. Initially the data were screened for missing and improbable data, and then multiple regression analyses were used to explore the relationship between the predictor variables, and their ability to predict PTSD symptoms.

**Results**

A variety of traumatic experiences were reported, and the length of time since the participants had experienced their traumatic event varied considerably (in months; M=108.09, SD=135.67). The mean score for the IES-R measure was (M=44.80, SD=22.95), adaptive coping (M=32.68, SD=7.80), maladaptive coping (M=25.08, SD=7.71), self-blame cognitions (M=2.97, SD=1.80) and resilience (M=53.34, SD=20.38).

Bivariate correlations were undertaken to examine the relationship between the predictor variables and criterion variable (Table 1). Maladaptive coping was significantly moderately positively related to the PTSD symptom score (r=0.675, p<0.001). There was a moderate significant negative relationship between total resilience and PTSD symptom score (r=-.549, p<0.001). The PTSD symptom score was weakly positively related to adaptive coping and (r=.005, p>.48) and self-blame cognitions (r=.190, p>.04). There was a weak positive relationship between the PTSD symptoms score and all the additional variables including age (r=.133, p>.11), gender (r=.133, p>.23), and length of time since the traumatic event (r=.165, p>.06). Participants rating themselves higher on maladaptive coping, adaptive coping and self-blame cognitions, and lower on resilience had more PTSD symptoms.

Normality checks were completed including homoscedasticity, multicollinearity, residuals for bias and independence of errors. The Durbin Watson test showed the residuals were independent, and the

**Table 1:** Pearson’s Correlation Matrix for the Criterion Variable (PTSD symptoms) and the Predictor Variables (Age, Gender, Length of Time since the Traumatic Event, Adaptive Coping, Maladaptive Coping, Self-Blame and Resilience).

Measure	IES-R	Age	Gender	Length time since event	Ad Cope	Mal Cope	Self-blame	Resilience
IES-R	-	.133	.081	.165	.005	.675***	.190	-.549***
Age	.133	-	-.295*	.558***	.098	.169	.013	-.081
Gender	.133	-.295*	-	-.111	.024	-.018	.142	-.161
Length time since event	.165	.558***	-.111	-	-.080	.155	.061	-.262
Ad Cope	.005	.098	.024	-.080	-	.249	-.053	.017
Mal Cope	.675***	.169	-.018	.155	.249	-	.274	-.608***
Self-blame	.190	.013	.142	.061	-.053	.274	-	-.311*
Resilience	-.549***	.110	-.161	-.262	.017	-.608***	-.311*	-

\*. Correlation is significant at the .05 level (two-tailed).

\*\* . Correlation is significant at the .01 level (two-tailed).

\*\*\*. Correlation is significant at the .001 level (two-tailed).

Note: IES-R: Impact Events Scale Revised; Ad Cope: Adaptive Coping scales of the Brief Cope; Mal Cope: Maladaptive Coping scales of the Brief Cope; PTCI: Post Traumatic Cognitions Inventory; CD-RISC: Connor Davidson Resilience Scale.

VIF and Tolerance statistics showed there was no multicollinearity between the variables. The assumptions needed for multiple regression were met, and there were no significant violations in the data. The results of the initial multiple regression analysis are shown in (Table 2). The enter method was used and initially all the variables were entered: age, gender, length of time since the traumatic event, adaptive coping, maladaptive coping, self-blame cognitions and resilience. Total PTSD symptoms was entered as the criterion variable. The model was significant ( $F(7, 79)=11.596, p<0.001$ ), and accounted for 51.4% ( $R^2$ ) of the variance, 47.1% when adjusted ( $_{adj}R^2$ ). Maladaptive coping styles was the only significant predictor of PTSD symptoms. The findings, therefore, show partial support for the study hypothesis that maladaptive coping style would predict PTSD symptoms, though adaptive coping styles, self-blame cognitions, resilience, age, gender and length of time since the traumatic event did not predict PTSD symptoms.

All the non-significant predictors were then removed to improve the precision of the model, and the multiple regression analysis was re-run with just maladaptive coping to examine the predictive power of this variable in predicting PTSD symptoms (Table 3). The model was significant ( $F(1, 85)=71.204, p<0.001$ ), and accounted for 45.6% ( $R^2$ ) of the variance, and 44.9% when adjusted.

## Discussion

### Summary of findings

The present study examined the relationship between coping styles, self-blame cognitions and levels of resilience in predicting PTSD symptoms. The aim of the research was to identify which variables predicted PTSD symptoms, and which variables were the strongest predictor within a mixed trauma sample. The study also examined the relationship between age, gender and length of time since the traumatic event in predicting PTSD symptoms. The multiple

regression analysis identified maladaptive coping was the only significant predictor of PTSD symptoms in this study. The research hypothesis was somewhat supported as it was predicted maladaptive coping would predict PTSD symptoms. However none of the other variables reached significance, and the remaining hypotheses was not supported as adaptive coping, self-blame cognitions, resilience, age, gender and length of time did not predict PTSD symptoms. These findings are consistent with the inconsistencies in the research base regarding the role of these predictors, and confirm the lack of clarity regarding the role of these predictor variables in the PTSD literature and these variables need understanding in more depth.

Age, gender and length since the traumatic event did not predict PTSD symptoms, which is inconsistent with a wealth of previous research [10-16]. However there has been some research to show these variables have not predicted PTSD symptoms [13,97]. Surprisingly gender did not predict PTSD symptoms, as women have been found to be such a consistent predictor of PTSD symptoms previously [4,10,15]. One potential explanation for this is the use of online social media to collect the responses. There has been a growth in online research in recent times, and perhaps this method of data collection allows the participant greater distance from the researcher and additional reassurance of anonymity. This type of research may enable men to be more open about their distress. It appears important to explore the use of online research and the difference between face to face research, and the possible function an online survey provides.

Resilience did not predict PTSD symptoms which is inconsistent with a number of previous studies [28-31]. However, there have been some research showing levels of resiliency did not predict PTSD symptoms [98,99]. Possible reasons for the inconsistency are twofold. The impact of military personnel and the problems with measurement. A large proportion of research into the role resilience plays and its ability to predict PTSD symptoms has been completed in

**Table 2:** Summary of Initial Regression Analysis using the enter method: Unstandardized and Standardized Coefficients, confidence intervals reported in parentheses and P-Values of variables as predictors of PTSD symptoms.

	B	SE B	$\beta$	p
<b>Constant</b>	12.9 (-23.10, 48.47)	17.98		.48
<b>Age</b>	0.13 (-2.28, 0.54)	0.21	.06	.53
<b>Gender</b>	4.93 (-3.98, 13.83)	4.47	.09	.27
<b>Length of time since event</b>	-0.00 (-0.04, 0.03)	0.02	-.01	.92
<b>Adaptive Coping</b>	-0.47 (-0.96, 0.03)	0.25	-.16	.07
<b>Maladaptive Coping</b>	1.83 (1.20, 2.48)	0.32	.62***	.001
<b>Self-blame Cognitions</b>	-0.70 (-2.83, 1.43)	1.07	-.05	.51
<b>Resilience</b>	-0.19 (-0.43, -0.05)	0.12	-.17	.12

Note:  $R^2 = .51.4$ , Adjusted  $R^2 = .47.1$

**Table 3:** Summary of Multiple Regression Analysis using the enter method: Unstandardised and Standardised Coefficients and P-Values of maladaptive coping variable as a predictor of PTSD symptoms.

	B	SE B	$\beta$	p
<b>Constant</b>	-5.61 (-18.04, 6.81)	6.25		.37
<b>Maladaptive Coping</b>	2.01 (1.54, 2.48)	0.24	.68***	.001

Note:  $R^2 = .45.6$ , Adjusted  $R^2 = .44.9$

military samples [31,32]. Therefore resiliency may be more important in military samples, and the significance of resiliency in such a population has been acknowledged by the army [31]. Interventions designed to improve resiliency such as the (CSF) [33], therefore may be more important in a military population. Previous research has also questioned the ability of the CD-RISC and its ability to successfully measure resiliency, due to the complexity of this construct and the difficulty in using a questionnaire to accurately measure such a complex concept [99].

Similar to resilience in this sample self-blame cognitions did not predict PTSD symptoms. The evidence base on self-blame cognitions is inconsistent, and these findings confirm previous inconsistencies found. Several studies have found self-blame cognitions have predicted PTSD symptoms [45-49], other researchers have found self-blame cognitions have not predicted PTSD symptoms [34,100,101]. The inconsistencies around self-blame cognitions appear to be related to context, and the specific type of trauma experience. Whilst in sexual abuse and physical assault survivors self-blame cognitions appear more pertinent [45,48,49], in physical health traumas self-blame cognitions appear to not predict PTSD symptoms [54,101].

It is possible physical health traumas could have similarities with natural disasters and viewed as uncontrollable events, rather than traumas of an interpersonal nature where an individual's behaviour or actions could be seen as possible causes of the traumatic event [101]. Researchers have reported specific forms of dysfunctional cognitions related to the traumatic event, can differ depending on the nature of the traumatic event [100]. Therefore, as the sample in the present study consisted of a mixed trauma population, this could possibly explain why self-blame cognitions did not predict PTSD symptoms.

As with previous research adaptive coping strategies did not predict PTSD symptoms [81,102], however many studies have found adaptive coping has predicted these symptoms [76,77]. Potentially the reason why an adaptive coping style did not predict a reduction in PTSD symptoms as hypothesised, is that adaptive coping styles need the availability of other factors for such coping strategies to be successfully implemented [81]. To use such active coping strategies, as being able to express how you feel and having available both social and instrumental support, requires the availability of social support and resources to use such strategies [81]. Having the availability of social support and material resources can help an individual have a sense of control over their situation [81]. Furthermore, when seeking social support which results in an unresponsive response, can lead to increased distress for the individual [103]. In the present study the researcher did not record information such as the participant's resources, and a possible lack in such resources could have explained the findings. The findings suggest adaptive coping needs to be understood in more depth, including the extent to which such coping strategies and the implementation of them requires support from others as opposed to an individual being able to implement them successfully alone.

In the initial multiple regression analysis when all the predictor variables were entered, maladaptive coping styles accounted for 51.4% of the variance in predicting PTSD symptoms. Upon all non-significant variables being removed maladaptive coping accounted for a large proportion of the variance 45.6%, highlighting the importance and predictive ability of maladaptive coping in predicting PTSD symptoms. These results show the sizable effect maladaptive coping has in predicting PTSD symptoms in this sample, and how meaningful maladaptive coping could be. The magnitude

of this finding is even more evident when comparing the variance maladaptive coping accounted for in this study with previous research. Previous researchers have found in their research 21.4% and 37% of the variance in predicting PTSD symptoms was accounted for by two predictor variables, one being maladaptive coping [104-106]. The impact maladaptive coping has in the sample is extensive, and again this is illustrated by previous research finding less variance was accounted for in their study 37.4%, and this model had four predictor variables [107]. When comparing the amount of variance maladaptive coping accounted for as a single predictor compared to other research, highlights the true effect this variable had in the present study.

The finding regarding maladaptive coping and its predictive power is consistent with previous research and theories of PTSD, linking healthy adaptation to traumatic events with variances in coping style [1]. As psychological variables are more easily modified than demographic variables, it is imperative to identify such variables as possible areas to focus on during interventions [4].

This finding is consistent with previous research demonstrating maladaptive coping styles predict PTSD symptoms [63-67]. Such maladaptive styles can be passive and concentrate on emotion-focussed attempts, and it could be expected that such a style is related to the development and maintenance of PTSD symptoms [108,109]. Maladaptive strategies in the short term can help to cope with the immediate aftermath of the traumatic event; however these strategies become dysfunctional in the long term and can prolong distress [107]. Individuals may use such strategies in the short term due to the often chaotic and uncontrollable nature of an individual's response, which relies on the applicability of such strategies to help cope and regain some level of control [72].

The use of avoidance; trying to avoid or push away certain thoughts can increase the frequency and intensity of such thoughts [110]. This can result with an individual experiencing increased distress, rather than coping effectively. If an individual continues to employ such strategies avoidance of triggers could impact upon daily functioning, which in turn could increase the experience of avoidance and intrusion symptoms [111]. Active thought suppression is another maladaptive coping strategy individuals can deploy after experiencing a traumatic event as described in a model of PTSD [1]. Often when an individual tries to suppress such thoughts in a similar way to avoiding them, this can result in an increase in distress as often it can make the thought more apparent. These thoughts can then help to maintain PTSD symptoms by creating negative emotions, and by promoting the use of maladaptive coping strategies [1]. Maladaptive strategies of self-criticism and unproductive counterfactual thinking, can contribute to the continued experience of PTSD symptoms [112].

Maladaptive coping strategies can be used when an individual still perceives there is a sense of threat evident, and the threat needs controlling [1]. Individuals can use maladaptive coping strategies to try and avoid the sense of threat and control it, and can choose from a range of strategies depending on the individual's belief about how best to cope successfully with the trauma [1]. Such control strategies can maintain PTSD symptoms by producing such symptoms, stopping individuals from changing their appraisals regarding the trauma and stopping change in the individual's memory of the event [1]. Therefore, when individuals use such maladaptive coping strategies e.g. avoidance, the research and theory detailed above demonstrates how PTSD symptoms can be produced, and more importantly maintained.

A cognitive model of PTSD describes how the sense of threat after an event can lead to the occurrence of PTSD symptoms [1]. An appraisal of the trauma and or its sequel is a crucial process maintaining a sense of threat. Such appraisals can maintain PTSD symptoms as these promote the individual to use dysfunctional coping strategies, which then exacerbates symptoms [1]. Whilst some of the findings from this research offer support to the model regarding the role coping strategies can play in the maintenance and development of symptoms, some inconsistencies remain.

### Limitations

This study was slightly under-powered for a medium effect size, and multiple regression analysis. The lower number of participants recruited for this study is likely to have limited the results. A slightly larger sample would be required to adequately investigate the true predictive power of the predictor variables to PTSD symptoms. In addition the cross-sectional nature of the design means no conclusions can be made regarding order of effects, or causality.

Concerns have been raised regarding the factorial stability of the PTCI measure. Previous research has demonstrated a lack of concurrent validity regarding the self-blame measure, questioning its ability to measure self-blame cognitions. It has been suggested the self-blame subscale should be developed considering the role the nature of the traumatic event plays, and the amount of blame could be dependent on the nature of the event and whether this influences the psychometric properties of the scale [100].

Using anonymous online social media as a method of data collection involves self-identification by individuals that they meet the inclusion/exclusion criteria. There is no way of knowing that the individual has provided true demographic information [113]. Online research requires and individual to have access to a computer, and many older individuals, individuals of a minority background and people with limited income may not have access to such resources [114]. Therefore this method of data collection could have led to a non-representative sample.

### Future Research

The findings of the present study suggest the question needs exploring in further detail, and there may be specific relationships between the variables and the nature of the traumatic event. The findings of this study and previous research [100,101], would suggest when exploring the relationship between psychological variables and PTSD symptoms, context is extremely important including the specific nature of the trauma and the participant population being researched. In regards to the experience of distress again the context appears to be important, and future research could focus on exploring the variables included in this study however with different populations where the sample consists of individuals who have experienced the same type of trauma, rather than a mixed trauma sample. Future research could then establish which factors are important in regards to the development and maintenance of PTSD symptoms in specific trauma populations.

Due to the increase in online research and the possibility individuals may be dishonest regarding their demographic information [113], future research could attempt to explore and understand the validity of online research and the extent to which people may be dishonest. Using a questionnaire based design does not access the reality and construction of the individual's experience [115]. Using this design is helpful to get an overall sense of the issues

involved, however this information still remains distant from the individual's life. Therefore, further research could attempt to explore the experience and understanding people themselves have of their traumatic event.

### Clinical Implications

Findings of the present study demonstrate the differences in coping style can predict PTSD symptoms, in particular maladaptive coping styles. Clinically it may be useful to start with identifying the individual's coping style, as this would provide information to clinicians regarding the individual's coping strategies. Upon identifying an individual's coping style/strategies if these appear to be maladaptive, an initial starting point could focus on psycho-education regarding the implications such strategies could have. Interventions could then focus on any dysfunctional strategies that either stop memory elaboration, or intensify symptoms [1]. Cognitive behavioural approaches including cognitive processing and cognitive restructuring could be used to help with such aims [1,116]. Additionally reducing the reliance of maladaptive strategies by increasing positive approaches to coping, and teaching individual's alternative ways to cope with symptoms may also reduce their distress [67,117].

The study's findings suggest in order to maximise clinical relevance, the clinician needs to take into consideration the specific nature of the individual's traumatic event. This could then provide important information regarding the type of intervention an individual would need, and the content of the intervention that should be delivered depending on the specific context and type of trauma the individual has experienced. This will ensure clinical practice is more fully based on the evidence emerging in this field.

### Conclusion

This study investigated the relationship between age, gender, length of time since the traumatic event, coping styles, self-blame cognitions and levels of resilience, in predicting PTSD symptoms a combination that had not been previously explored. Maladaptive coping was the only significant predictor of PTSD symptoms, and this finding adds to the evidence base regarding the strength of maladaptive coping in predicting such symptoms. Further research is needed with different samples, to explore the context specific nature these variables have in predicting PTSD symptoms.

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