THE INTERRELATIONSHIP BETWEEN COPING STYLES, COGNITIVE APPRAISAL, POST-TRAUMATIC STRESS DISORDER SYMPTOMS AND PSYCHOLOGICAL REACTIONS IN INDIVIDUALS WITH HAND INJURIES

by

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Abstract

The interrelationship between coping styles, cognitive appraisal, post-traumatic stress disorder symptoms and psychological reactions in individuals with hand injuries

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The following study examined the psychological reactions following hand injuries and the interrelationship of coping styles (in particular, emotion-versus problem-focused coping), post-traumatic stress disorder reactions and psychological distress in this client group, compared to a comparison group of individuals with non-traumatically induced hand deformities (primarily Dupuytren's contractures). The hypothesized positive impact of problem-focused coping and negative impact of emotion-focused coping on psychological outcome was also investigated.

A total of 25 individuals with hand injuries and 20 individuals with a hand deformity were interviewed. This involved completion of a semi-structured interview plus a range of standardized assessment scales including the COPE (coping inventory), the Post-traumatic Stress Disorder Inventory, the Impact of Event Scale and the Hospital Anxiety and Depression Scale (HAD). The majority of hand injury sufferers were seen six days to four weeks after their injury and three participants were seen at a longer duration of injury between 10 months to three years. Individuals were followed up at an average of approximately four months.

The results showed significantly higher levels of PTSD symptomatology, anxiety and negative affect (at time 1) and emotional distress (at time 2) in the hand injury group compared to the comparison group. Increased use of emotion-focused coping in the hand injury group at time 2 coincided with differences in appraisal. The hand injury group appraised their injury as more threatening than the comparison group and loss appraisals were their predominant form of appraisal at time 2, whereas challenge appraisals were predominant in the comparison group.

Positive associations emerged between both problem- and emotion-focused coping, PTSD symptoms and HAD anxiety and depression scores, although the correlations with emotion-focused coping tended to account for more common variance compared to those with problem-focused coping.

Cross-lagged panel correlations indicated a possible causal influence of emotion-focused coping on total PTSD-I scores, intrusion on the Impact of Event Scale and anxiety (providing some support for the negative impact of emotion-focused coping). Analysis also suggested a possible role of problem-focused coping in the onset of anxiety symptoms, in addition to a bi-directional relationship between problem-focused coping and total PTSD-I scores. However, the failure of these results to reach statistical significance cannot provide conclusive evidence for these effects.

The findings are discussed in relation to previous research and suggestions are made for future studies.
<table>
<thead>
<tr>
<th>List of contents</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Copyright statement</td>
<td>1</td>
</tr>
<tr>
<td>Title page</td>
<td>2</td>
</tr>
<tr>
<td>Abstract</td>
<td>3</td>
</tr>
<tr>
<td>List of Contents</td>
<td>4</td>
</tr>
<tr>
<td>List of Tables</td>
<td>5</td>
</tr>
<tr>
<td>Acknowledgements</td>
<td>6</td>
</tr>
<tr>
<td>Author's Declaration</td>
<td>7</td>
</tr>
<tr>
<td>Chapter 1: Introduction</td>
<td>8</td>
</tr>
<tr>
<td>Chapter 2: Method</td>
<td>38</td>
</tr>
<tr>
<td>Chapter 3: Results</td>
<td>56</td>
</tr>
<tr>
<td>Chapter 4: Discussion</td>
<td>85</td>
</tr>
<tr>
<td>Appendices</td>
<td>110</td>
</tr>
<tr>
<td>References</td>
<td>141</td>
</tr>
</tbody>
</table>
List of Tables

Table 1: Demographic variables
Table 2: Type of hand injury and duration of injury
Table 3: Means and standard deviations of measures of psychological distress for hand injury and comparison groups at time 1 and time 2
Table 4: Mean ratings (and standard deviations) of the amount of social support received and its helpfulness for hand injury and comparison groups
Table 5: Means and standard deviations of problem- and emotion-focused coping strategies as measured by the COPE and perceived coping skills
Table 6: Appraisal ratings (means and standard deviations) on "matters," controllability, predictability, degree of threat and whether the event was life threatening
Table 7: Contingency tables of threat, loss or challenge appraisals at time 1 and time 2 for hand injury and comparison groups
Table 8: Correlations between problem- and emotion-focused coping strategies and PTSD symptoms for hand injury and comparison groups
Table 9: Correlations between coping strategies, HAD anxiety and depression scores and PANAS (positive and negative affect) scores
Table 10 (a): Correlations between emotion-focused coping scores at time 1 and scores on measures of psychological distress at time 2, versus correlations between problem-focused coping at time 1 and these same measures at time 2
Table 10 (b): Correlations between measures of psychological distress at time 1 and emotion- and problem-focused coping at time 2
Table 11: Correlations between threat appraisal and scores on the PTSD-I, IES, VAS emotional distress, PANAS and problem- and emotion-focused coping
Table 12: Most and least helpful ways of coping reported by hand injury and hand comparison groups
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Author's Declaration

At no time during the registration for the degree of Doctor of Clinical Psychology has the author been registered for any other University award.

The contents of this bound volume are identical to the volume submitted for examination in temporary binding except for the amendments requested at the examination.

This study was conducted while the author was a Trainee Clinical Psychologist in the South West Region based in East Gloucestershire NHS Trust and the research was conducted in collaboration with Frenchay Healthcare Trust.

Signed...

Date: 30.6.15

7
Chapter One

Introduction

Review of research on PTSD, psychological functioning and coping styles in individuals with hand injuries.

1.1. Definition of post-traumatic stress disorder and psychological reactions following traumatic events.

The effects of traumatic events have been documented for several centuries now. Thus, Kraepelin, a nosologist in the nineteenth century, described a clinical condition termed "schrecknurose" (fright neuroses), characterized by "multiple nervous and psychic phenomena arising as a result of severe emotional upheaval or sudden fright which would build up great anxiety; it can therefore be observed after serious accidents and injuries, particularly fires, railway derailments or collisions" (Kraepelin, 1896, in Saigh, 1992).

Later descriptions of post-traumatic stress responses recognized the type of trauma, with labels such as "combat fatigue; shell shock; or rape trauma syndrome (Foa, Steketee and Rothbaum, 1989). The diagnostic category of post-traumatic stress disorder (PTSD) was created in 1980 and reported in the Diagnostic and Statistical Manual of Mental Disorders (DSM-III: American Psychiatric Association : APA) describing a range of behavioural, social and emotional abnormalities in individuals exposed to trauma. The DSM-III-R defines the disorder as involving "the development of characteristic symptoms following a psychologically distressing event that is outside the range of usual human experience" (APA, 1987, p. 247) and which would evoke distress in almost anyone. Examples of potential classes of trauma included are "serious threat to one's life or physical integrity; serious threat or harm to one's children, spouse or other close relatives and friends; sudden destruction of one's home or community; or seeing another person who has recently been, or is being, seriously injured or killed as the result of an accident or physical violence," although it is unclear which individual experiences qualify as critical
in nature and intensity (Muran and Motta, 1993). The diagnostic criteria for identifying the disorder include: A: persistent re-experiencing of the traumatic event in at least one of the following ways:

1. recurrent and intrusive, distressing recollections of the event
2. recurrent distressing dreams of the event
3. sudden acting or feeling as if the traumatic event were recurring (includes a sense of reliving the experience, illusions, hallucinations, and dissociative (flashback) episodes, even those that occur upon awakening or when intoxicated)
4. intense psychological distress at exposure to events that symbolize or resemble an aspect of the traumatic event, including anniversaries of the trauma;

B: persistent avoidance of stimuli associated with the trauma or numbing of general responsiveness (not present before the trauma), as indicated by at least three of the following:

1. efforts to avoid thoughts or feelings associated with the trauma
2. efforts to avoid activities or situations that arouse recollections of the trauma
3. inability to recall an important aspect of the trauma (psychogenic amnesia)
4. markedly diminished interest in significant activities
5. feeling of detachment or estrangement from others
6. restricted range of affect, e.g., unable to have loving feelings
7. sense of foreshortened future, e.g., does not expect to have a career, marriage, or children, or a long life;

C: persistent symptoms of increased arousal (not present before the trauma), as indicated by at least two of the following:

1. difficulty falling or staying asleep
2. irritability or outbursts of anger
3. difficulty concentrating
4. hypervigilance
5. exaggerated startle response
(6) physiologic reactivity upon exposure to events that symbolize or resemble an aspect of the traumatic event and D: duration of disturbance of at least one month. DSM-IV (1994) further states that in exposure to the traumatic event: (1) "the person experienced, witnessed, or was confronted with an event or events that involved actual or threatened death or serious injury, or a threat to the physical integrity of self or others and (2) the person's response involved intense fear, helplessness, or horror" (p.427-428).

Other associated features of PTSD are symptoms of depression and anxiety, which may be sufficiently severe to be diagnosed as an anxiety or depressive disorder; impulsive behaviour and symptoms of an organic mental disorder, such as poor memory.

Investigations involving a range of populations and settings have yielded strong support for the validity of PTSD as a unique psychiatric entity (for example, Muran and Motta, 1993; Saigh, 1992).

1.2. Prevalence of PTSD

Discordant estimates of the prevalence of the disorder have been found, ranging from low to high levels of psychiatric morbidity even within the same category of trauma. For example, in victims of traffic accidents, there are estimates of PTSD of approximately 10% at six months and 9% at 28 months (Malt, 1988), although higher rates of individuals suffering with symptoms relating to the coping process have been reported with 10 - 17% suffering moderate symptoms of intrusion and avoidance at six months (Brom, Kleber and Hofman, 1993) and 20% at two and a half years after the accident (Malt, 1988).

In a study of 48 British victims of physical trauma, Feinstein and Dolan (1991) report prevalence rates of PTSD of 25% at six weeks and approximately 14% at six months, higher than the rates of 1% for the total USA population and 3.5% for those exposed to physical attack (Helzer, Robins and McEvoy, 1987). Higher prevalence figures are reported from war and disaster situations. These
findings thus suggest that "exposure to a psychologically traumatic event does not inevitably lead to the development of PTSD" (Saigh, 1992, p. 22).

1.3 **Proposed psychological variables mediating between the traumatic event and subsequent outcome**

Although PTSD is common following major traumatic events, there are considerable unexplained differences in the chronicity and severity of symptoms (Joseph, Brewin, Yule and Williams, 1991). The intensity and complexity of traumatic events do not explain the development of PTSD symptoms by themselves (Foa et al., 1989). For example, Feinstein and Dolan's (1991) findings suggest that with regard to victims of accidental injury, scores on the Impact of Event scale were the single most important predictor of psychiatric morbidity (i.e. the way an individual "assimilates and deals with a traumatic event ultimately has the greatest influence in determining outcome" (p.90)). This contradicts the DSM-III-R concept of the stressor being the key aetiological factor. Likewise, Perry, Difede, Musngi, Frances and Jacobsberg's (1992) prospective study found that patients with severe burns injuries were not more likely to develop PTSD which was predicted by subjective variables such as perceived social support.

In addition to the nature, duration and complexity of traumatic stress, a number of psychological variables have been hypothesized as mediators between the event and subsequent outcome, including cognitive, personality, social, genetic and environmental factors (Scott and Stradling, 1992).

1.4 **Models of PTSD and the role of psychological variables (e.g. coping)**

Models of PTSD have emerged from various theoretical approaches, including a learning model of instrumental and classical conditioning and a cognitive behavioural formulation incorporating the "meaning" of the traumatic event and the concepts of predictability and controllability. According to psychobiological models, the negative symptoms such as numbing and reduced motivation reflect the norepinephrine depletion arising from the
inescapable stress of the trauma, and positive symptoms such as intrusive thoughts, reflect a chronic hypersensitivity of norepinephrine receptors (Van der Kolk, 1987). Kolb's (1988) conditioned emotional response model suggests that PTSD symptomatology reflects an impaired neuronal cortical network.

At present, no comprehensive theory of PTSD adequately accounts for all PTSD symptoms included in the DSM-III-R criteria for the disorder. However, attempts have been made to account for the potential role of the previously mentioned psychological variables. For example, McFarlane (1991) has proposed a model of PTSD components in which there is a reciprocal relationship between intrusive imagery and avoidance behaviour which may lead to disordered arousal, whilst the efficacy of the individual’s coping responses probably determines whether the disorder is maintained (maladaptive coping responses may fuel the feedback loop whilst adaptive coping responses may break the cycle). In addition to effective social support, adaptive coping style is also identified as a prophylactic feature in Scott and Stradling's (1992) model of PTSD comprising three vulnerability features (high levels of stress or exposure; pre-existing personality or emotional disorder and family history of psychiatric disorder). Similarly, Saigh (1992) proposes a biopsychosocial conceptualization of PTSD. Similar to that of Barlow (1988) to account for the aetiology and maintenance of anxiety) Saigh's (1992) model incorporates a complex interaction of biological, psychological and environmental events. These events consist of psychological vulnerability (including a sense that the stressful event is unpredictable or uncontrollable and which may be mediated by coping skills, social support and a history of emotional problems); exposure to adverse life events prior to and after the trauma; the extent and severity of the stressor; the activation of a true or learned alarm, and subsequent anxious apprehension and re-experiencing in response to learned alarms, producing a downward spiral of negative affect, particularly anxiety.
1.4.1 Perceived (versus actual) threat, the impact of life-threatening trauma; predictability and controllability.

It has been suggested that events perceived as life-threatening in addition to the occurrence of a trauma in a safe environment, may increase the likelihood of developing PTSD since when stimuli which previously signalled safety are associated with danger, "one's world becomes less predictable and controllable," (Foa et al., 1989, p. 166). Experimental studies have demonstrated that animals and humans prefer predictable and controllable aversive events compared to unpredictable and uncontrollable aversive events. Unpredictability of the trauma and the perception of unexercised controllability may also exacerbate post-traumatic stress reactions, particularly guilt (which might be described as a failure to exercise perceived control) (Foa et al., 1989).

The preference for signalled events may be explained by the fact they allow anticipatory coping to prepare for the stressor in some way (Lazarus and Folkman, 1984) or that warning informs a person they are safe from a stressor. Although a change from predictability to unpredictability results in pituitary-adrenal cortical activity and is very stressful, there are important individual differences in humans which might be explained by cognitive mediation.

This hypothesis that perceived controllability is a critical factor in adaptation to an extreme event is confirmed by Fairbank et al.'s (1991) study which found that repatriated prisoners of war from World War II with PTSD reported significantly less control over the impact of captivity memories than repatriated prisoners of war without PTSD.

1.4.2 The role of intrusive imagery, avoidance and other vulnerability factors.

McFarlane's (1992) large longitudinal study involving causal analysis of firefighters who had experienced extreme exposure to a bushfire disaster (followed up at 4, 11 and 29 months) identified intrusive cognitions and intrusive imagery relating to the traumatic event as the causal link between the traumatic event and the onset of PTSD and other post disaster disorders, (whilst avoidance strategies were not directly related to the disorder and were described
as "a response to the distress and pain caused by trauma, rather than a primary link to the symptoms" (p.443)).

These findings would appear to support Horowitz's (1986) information-processing model of PTSD, as resulting from an oscillating pattern of intrusive cognitions in response to a sudden traumatic event and avoidant manoeuvres to ward off this internal distress, and as a consequence of an inability to integrate the traumatic memories with pre-existing schemata. However, intrusive imagery and associated distress were found to predict only 20% of the variance of PTSD, thus implicating the role of other vulnerability factors underlying the onset of symptoms. Using a discriminate function analysis to compare individuals with high intrusion levels who were not disordered after the fire versus those with high intrusion levels who were disordered, vulnerability factors of a family history of psychiatric illness and neuroticism predicted the progression from distress to the disorder in 67% of cases. Thus, genetic or personality-linked variables may also be key predisposing factors in the development of disordered arousal in PTSD.

Feinstein and Dolan (1991) studied 48 patients who had undergone a range of accidental injuries (ranging from motor-bike accidents to assault). Potentially life-threatening trauma and high subjective ratings of the severity of trauma were significantly more common among individuals classed as "psychiatric cases" (as assessed by high scores on the Clinical Interview Schedule (Goldberg, Cooper, Eastwood, Kedward and Shepherd, 1970)) compared to non-cases, at initial assessment, but not at a six week or six month follow up, thus indicating no lasting impact of these variables on long-term distress. However, discriminant function analysis involving a range of variables including age, sex and social class, showed that scores on the Impact of Event Scale (Horowitz, Wilner and Alvarez, 1979) were the single most important predictor of general psychiatric morbidity and PTSD at six weeks and six months. These findings thus provide additional support for the importance of the individual's subjective response to a traumatic event rather than the severity of the stressor in the pathogenesis of post-traumatic symptomatology.
Likewise, Malt and Olafsen's (1992) study of 109 accidentally injured adults found that ratings of intrusion, avoidance and anxiety were more strongly correlated with psychopathology than "objective" danger or injury severity. Also, the personal meaning and secondary appraisal of the trauma seemed to determine appraisal of the severity of the situation (rather than the severity of the physical injury or "objective" threat to life), thus confirming that personal meaning of the trauma is more effective in predicting later negative outcome than the PTSD criterion of an "objective" stressor (p. 131). Moreover, they found that the majority of individuals showed minimal intrusion according to the Impact of Event Scale, indicating that "intrusive cognitions are not a universal feature of acute response to accidental injury." (p. 129).

Criticisms of this approach to trauma which emphasizes personal perception have, however, been made. Kreitler and Kreitler (1988) state that such an approach fails to promote possibilities of intervention and fails to consider the predisposing role of personality factors in shaping an event into the experience of trauma. This approach also fails to specify the relationship between anxiety and trauma which the authors suggest depends on the individual's meaning assignments to events (which seem to be modifiable and produce a reduction in anxiety experienced).

1.4.3 Social support

There are reports of an inverse relationship between an individual's social resources (both in terms of quantity and quality of support derived from social relationships) and psychological impairment. Billings and Moos (1981) suggest that such social resources may thus be another moderating variable between a stressful event and psychological functioning. Social withdrawal may also increase PTSD intensity (Solomon, Mikulincer and Avitzur, 1988a). Help-seeking behaviour has been found to buffer the detrimental effects of negative life events on PTSD whilst a deterioration of social network appears to be associated with PTSD (Solomon, Mikulincer and Flum, 1988b). On the other hand, social withdrawal from all interaction may be an effective short-term
strategy for coping with chronic daily stressors such as work overload (Repetti, 1992). In spite of these findings, the direction of causality between resources and PTSD remains unknown.

1.5 Definitions of stress, appraisal and coping

Stress may be conceptualized as a transactional relationship between the person and the environment which is "appraised by the person as exceeding his or her resources and as endangering his or her well-being" (Folkman, 1984, p. 840) and mediated by the two processes of appraisal and coping (Folkman and Lazarus, 1980).

Cognitive appraisal can be defined as "the process of categorizing an encounter and its various facets with respect to its significance for well-being" (Lazarus and Folkman, 1984, p. 31) and which is focused on meaning or significance to the individual. Research has shown that cognitive appraisal is a central concept in mediating thought, feeling and action to an encounter (Lazarus and Folkman, 1984).

Primary appraisal (the evaluation of the significance of a transaction relating to well-being) has been distinguished from secondary appraisal (the evaluation of different coping strategies and options (Folkman, 1984)). Primary appraisals may lead either to an evaluation that the situation is benign or to a stress-related appraisal. A stress-related appraisal may be perceived as harm or loss (where some injury or damage to the person has been sustained including damage to self-esteem); threat (concerning an anticipated harm or loss) or challenge (which focuses on the potential for gain or growth in an encounter and characterized by pleasurable emotions).

Coping refers to "cognitive and behavioural efforts to master, reduce, or tolerate the internal and/or external demands that are created by the stressful transaction" (Folkman, 1984, p. 849). This definition thus recognizes that coping is process oriented (focusing on what the individual thinks and does in a specific encounter) and is contextual (influenced by the individual's appraisal of the demands in the encounter and the resources for managing them) and
does not assume what constitutes successful and unsuccessful coping, thus overcoming the confounding present when coping is defined in terms of the outcome it is used to explain (Folkman, 1984).

1.5.1 Functions of coping: Emotion- versus problem-focused coping

Two widely recognized major functions of coping are to regulate emotions or distress (emotion-focused coping) and to manage the problem that is causing the distress (problem-focused coping) (Folkman and Lazarus, 1980, p. 223). An individual's coping pattern has been defined as "the combined proportion of problem- and emotion-focused coping used in a specific episode" (Folkman and Lazarus, 1980, p. 219) and coping styles as "clusters of patterns or profiles." (p. 229).

Folkman and Lazarus' (1980) study of 100 males and females aged between 45 to 64 years who were asked to indicate how they coped with a variety of minor and major life events using a checklist of both problem-focused strategies (such as "made a plan of action and followed it") and emotion-focused strategies (for example, "accepted sympathy and understanding from someone") found both forms of coping were used in over 98% of a total of 1,300 stressful encounters.

Although coping efforts are made in response to stress appraisals, appraisal and coping seem to continuously influence each other throughout a stressful encounter. An appraisal of harm/loss, threat, or challenge thus "stimulates coping efforts that change the person-environment relationship by altering the relationship itself (problem-focused coping) and / or by regulating emotional distress (emotion-focused coping)" (Folkman and Lazarus, 1980, p. 223-224).

A second distinction within the transactional model of stress, is between appraisal (resulting in an attempt at coping) and reappraisal (a changed appraisal on the basis of new information from the environment, which may resist or nourish pressures from the person, and /or information from the person's own reactions (Lazarus and Folkman, 1984, p. 38)). The identification of appraisal as a determinant of coping, or coping as a determinant of appraisal,
is thus provisional, depending upon where one interrupts the ongoing
dynamic relationship between the two” (Folkman and Lazarus, 1980, p. 224).

Coping strategies may be used to change the meaning of a situation thereby
enhancing the individual's sense of control and may thus be difficult to
distinguish from appraisal (Folkman, 1980, p. 845). However, emotion-focused
coping strategies differ qualitatively from problem-focused strategies in that
they are used to control distressing emotions, whilst problem-focused coping is
used to control the person-environment relationship via problem-solving,
decision making and / or direct action.

Since heightened emotions will be expected to interfere with the cognitive
activity required for problem-focused coping, problem-focused coping is likely
to be accompanied by emotion-focused coping (Folkman, 1984).

1.5.2 Clinical significance of type of coping strategy employed

There is evidence to suggest a negative impact of emotion-focused coping on
psychological outcome in contrast to a positive impact of problem-focused
coping.

In a mixed gender adult community sample, Billings and Moos (1981) observed
that more use of problem-focused strategies and fewer emotion-focused
strategies (particularly avoidance coping) were associated with less
psychological and physical distress (as assessed by indices of anxiety and
depression and physical symptoms) even when life change events were
accounted for. Compared to a matched group of nondepressed persons,
depressed persons have been found to be less likely to use problem-solving
responses and more likely to use emotion-focused coping (Billings, Cronkite
and Moos, 1983). Emotion-focused strategies have been positively associated
with PTSD intensity (Solomon et al., 1988a) in a longitudinal study of Israeli
soldiers followed up two and three years after participation in the 1982 Lebanon
war. Emotion-focused coping strategies (in particular, acceptance and escape-
avoidance coping behaviours) have also been noted to be more frequent in war
veterans with PTSD compared to those without PTSD (Blake, Cook and Keane,
1992). Fairbank, Hansen and Fitterling (1991) also found that compared to repatriated prisoners of war without PTSD, those with PTSD used more self-isolation and wishful thinking in relation to coping with memories of events from World War II. In addition, Fairbank et al. (1991) found that well-adjusted prisoners of war used emphasizing the positive, distancing and problem-focused coping more frequently than other coping strategies to deal with memories to World War II but not recent stressors.

Similarly, Nezu and Carnevale (1987) found that Vietnam veterans with PTSD reported fewer problem-focused coping reactions than veterans with adjustment problems but no PTSD. Solomon et al. (1988b) also reported that a greater number of negative life events are correlated with more emotion-focused coping in Israeli soldiers followed up one and two years after the 1982 Lebanon war. The choice of coping strategies remained a significant predictor of PTSD even after the impact of these negative events was controlled for. Although direction of causality could not be determined, they hypothesize a "cycle of maladjustment" where life events encourage the use of emotion-focused coping, which in turn might promote more negative life events and more severe PTSD (p. 306).

However, an important concern in coping research is one of circularity, since use of specific coping styles may either be a cause or a result of psychological distress (and / or the number of life events). Coping style may also be an associated feature of PTSD (Blake et al., 1992).

1.5.3 Use of emotion-focused coping and explanation for its maladaptiveness

A number of suggestions have been made regarding the use of and maladaptiveness of emotion-focused coping. According to Lazarus (1981) the development of a psychological illness following a stressful event is mediated by threat appraisal (in addition to coping responses) which is followed by negative emotions. In turn, these emotions may prevent the use of problem-focused coping by directing coping towards excessive emotional regulation and
away from problem-solving. The adaptational outcome of such coping may thus be poorer, reinforcing the basis for feeling threatened (Folkman, 1984).

Clinical evidence for this stems from Solomon, Mikulincer and Berbenishty's (1989) study in which appraisal of greater threat (in addition to more negative emotions and use of more emotion-focused coping) was one factor which predicted the severity of PTSD in casualties of the 1982 Lebanon War.

In contrast, the person who feels challenged is likely to generate fewer negative emotions that require attention and is therefore in a position to engage in problem-focused coping efficiently (Folkman, 1984). The tendency to use emotion-focused coping might also be related to the appraisal that little can be done to alleviate distress. Alternatively, the actual distress may predispose a person to focusing on their inner state (Solomon et al., 1988b).

The maladaptiveness of emotion-focused coping strategies (such as mental or behavioural disengagement and denial) might be accounted for by Foa et al.'s (1989) hypothesis that such avoidance tactics are not adaptive since they fail to allow emotional processing to occur. In the absence of repeated exposure to the fear producing material, the fear structure in PTSD (which involves a network in memory that includes information about the feared stimulus such as the situation; verbal, physiological and behavioural responses (Lang, 1977)) is thus unable to be modified to allow the integration of corrective information.

Intrusion is likely to interfere with processing by preventing new information inconsistent with that contained in the fear structure from being effectively incorporated and may also give rise to behavioural and cognitive avoidance (Creamer, Burgess and Pattison, 1990). Effective cognitive processing will thus only take place when levels of cognitive arousal (as measured by scores on the intrusion subscale of the Impact of Event Scale) and avoidance are low enough to allow the fear structure to be activated (Creamer et al., 1990).

The results of unsatisfactory emotional processing may then result in symptoms of post-traumatic stress disorder. Thus, Rachman (1980) states: "The central, indispensable index of unsatisfactory emotional processing is the
persistence or return of intrusive signs of emotional activity (such as obsessions, nightmares, pressure of talk, phobias, inappropriate expressions of emotion, that are out of context or out of proportion, or simply out of time). Indirect signs may include an inability to concentrate on the task at hand, excessive restlessness, irritability..." (p. 51). This has been confirmed by Perry et al. (1992) in burns patients who found significant associations between avoidant thoughts on the Impact of Event Scale and PTSD.

1.5.4 Causal attributions

Causal attributions made by victims about their traumatic experiences have also been hypothesized to explain individual variation in reactions to traumatic events. According to Brewin (1988), such causal attributions (beliefs a person holds about the causes of an event) influences how they respond to that event. The perceived causes of an event have been differentiated on the dimensions of internality (internal causes referring to personal characteristics) versus external causes (environmental factors); stability (stable causes remaining the same over time) versus unstable causes (which change) and controllability (the extent to which a cause is perceived to be under personal control) (Weiner, 1986). Internal (as opposed to external), stable (as opposed to unstable) and global (as opposed to specific) attributions regarding negative events are believed to constitute a risk factor for severe helplessness behaviour (including sadness, anxiety, lowered self-esteem and cognitive deficits) and depression (Abramson, Seligman and Teasdale, 1978). This learned helplessness attributional style has been found to be significantly related to measures of PTSD in addicted patients (McCormick, Taber and Kruedelbach, 1989) who propose that this link is due to the individual’s expectations regarding the uncontrollability of the present and future circumstances.

1.5.5 The impact of controllability

The link between causal attributions, coping responses, psychological outcome and PTSD is an interesting one. Negative outcomes do not therefore inevitably
follow uncontrollable events since reappraisal and cognitive coping may alter the personal meaning of the situation to ameliorate distress (Folkman, 1984). Beliefs about control and appraisals of control may alter the extent to which a situation is appraised as threatening or challenging and can ultimately influence coping. Thus, an appraisal of threat with the resultant distressing emotions may impede problem-focused coping efforts, leading to poor resolution of the problem, whilst a challenge appraisal should facilitate effective problem-focused coping, thereby promoting a more successful outcome.

Another principle of effective coping is the ability to appraise when a situation is uncontrollable and abandon attempts to directly alter the situation and resort to emotion-focused coping to enhance acceptance. Poor outcome is likely to follow appraisal of an event as uncontrollable when it is in fact controllable (since the individual will fail to engage in adaptive problem-focused coping that could end the threatening situation) and appraisal of an uncontrollable event as controllable (when engagement in problem-focused coping is unlikely to resolve the problem) (Folkman, 1984).

1.6 Research on the relationship between coping styles and causal attributions in PTSD

In an attempt to integrate theories derived from attributional models and Lazarus and Folkman's (1984) stress-coping model, Mikulincer and Solomon (1989) found that Israeli soldiers' attributions of negative events to stable and uncontrollable causes were associated with an increased use of emotion-focused coping and a reduced frequency of problem-focused coping. Using a statistical technique based on classic path analysis, they found no direct association between causal attribution and combat-related psychopathology (as measured by the self-report checklist-90: SCL-90: Derogatis, 1979): an association which appeared to be mediated by coping strategies. Individuals with a tendency to attribute negative events to more internal, unstable and controllable causes were more likely to use problem-focused coping than subjects who made an
external, stable, uncontrollable attribution. Stable / uncontrollable attributions were also associated with more emotion-focused and less problem-focused coping. An attribution of negative events to uncontrollable causes may thus increase emotion-focused coping, which in turn may increase the severity of psychological distress. As Mikulincer and Solomon (1989) hypothesize, "coping strategies appear to be direct antecedents of combat-related psychopathology" (p. 280).

The importance of coping strategies was confirmed by Solomon et al.'s (1988a) study of Israeli soldiers who suffered a combat stress reaction during the 1992 Lebanon war, in which the impact of locus of control as a contributor to the variance in PTSD intensity was cancelled out by the contribution of coping strategies and social support.

Coping therefore seems to act as an intervening link between causal attribution and combat-related psychopathology. One limitation of these findings however, as acknowledged by Mikulincer and Solomon (1989), is that there is no definite evidence regarding the direction of causality between causal attribution and coping strategies. Although attribution may influence the selection of coping strategies, prior coping might also affect attribution for particular events. Alternatively, there may be a circular relationship between coping and attribution. As Lazarus, DeLongis, Folkman and Gruen (1985) state: "The only way these interlocking variables or systems can be separated is by studying their temporal relations cross-sectionally in slices of time, as first one variable and then another takes on the role of antecedent." (p.778).

1.7 Methodological problems in coping theory and research

There are a number of important methodological issues in coping theory and research. Although no single universally accepted definition of coping exists, there seems to be "an emerging initial consensus among theoreticians, clinicians, and researchers alike that cognitions constitute an important component of the individual's adaptation to extreme threatening and traumatic events" (Fairbank et al., 1991).
1.7.1 Assessment and conceptualization

A primary issue relates to the difficulties in assessing coping processes which should describe the person's actions and thoughts as they occur in specific naturalistic encounters (Lazarus, 1981, p.201). Folkman and Lazarus (1980) suggest the best way of assessing coping is to describe how people actually cope in specific stressful encounters.

Assessment will inevitably face the issue of self-report versus observational and inferential sources of knowledge which can only be addressed by correlating self-report coping styles with inferential, observer-based sources.

Coping has been conceptualized in several different ways. One is in terms of defensive or ego processes (with the aim of reducing tension and restoring equilibrium); as a personality trait (assuming peoples' behaviours and cognitions are consistent across situations, which fails to reflect the multidimensional and shifting nature of coping processes); as a situation-oriented approach (which tends also to be situation-specific) and as a transactional process as already described (emphasizing the changing process of coping over time in response to appraisals of the person-situation interaction: Lazarus and Folkman, 1984). However, even the transactional model might be criticized since the "environment" is really dependent on the individual's appraisal. This approach has also been criticized for its circularity, due to an overreliance on perception and a lack of emphasis on environmental aspects (Hobfoll, 1989), although as Lazarus et al. (1985) state, some confounding of psychological variables of stress is inevitable since "no environmental event can be identified as a stressor independently of its appraisal by the person" (p.776).

One related difficulty is that coping is "a constellation of many acts and thoughts engendered by a complex set of demands that may stretch out over time" (Lazarus, 1981,p.201), rather than a single act. An individual's characteristic coping style therefore involves a combination of many acts and thoughts rather than a single one. Ideally, a pattern description of a person's thoughts and actions should be gained to enable comparison of one person or
group with themselves (intra-individual) and with others (normative). The resultant ipsative-normative data enables an analysis of coping with varying stressful transactions.

There are also ambiguities in the definition of coping processes such as "denial" and "avoidance" which are often incorrectly assumed to reflect the same process and which may fail to be recognized as frequently transient concepts.

1.7.2 Circularity
Another important consideration in coping research is one of circularity, since use of specific coping styles may either be a cause or result of psychological distress. Thus, stress cannot be regarded as causal in maladaptive responses because of the range of coping processes it generates which, in turn is a product of inept coping as it is of environmental demands. As Hobfoll (1989) states: "Demand is that which is offset by coping capacity. Yet coping capacity is that which offsets threat or demand" (p.515).

The transactional perspective of dysfunction also requires recognition of the role of environmental influences in adaptation and maladaptation (Lazarus, 1980, p.208) and should study three perspectives: social, psychological and physiological levels simultaneously. In addition, there is limited knowledge of the process measures of coping and other transactional concepts such as threat and challenge.

1.7.3 Potential influences on choice of coping strategies
1. Appraisal
In addition to the increased use of emotion-focused coping in threatening or harmful situations appraised as having little potential for change, it has been hypothesized that emotion-focused coping will increase in situations that have to be accepted and under conditions of no control, whilst problem-focused coping is more common in situations appraised as having the potential for change by action, in situations where something constructive could be done and where more information was needed (Folkman and Lazarus, 1980).
2. Gender

Gender differences have been reported in terms of more use of problem-focused coping in men compared to women at work and in situations that have to be accepted and requiring more information (Folkman and Lazarus, 1980). Ptacek, Smith and Zanas (1992) report both more use of problem-focused coping in men and greater emotion-focused responses in women. Likewise, Billings and Moos (1981) found women were more likely to use avoidance coping. Others, for example, Hamilton and Fagot (1988), report no difference between men and women in either coping strategy, although they analyzed coping by asking subjects how they coped with a given situation and then coding them as expressive (self-soothing) or instrumental (problem-solving) rather than using the Ways of Coping Checklist.

3. Context

The context of the event is another key potential influence on coping, with findings that problem-focused coping is used more at work, whilst emotion-focused coping is used to deal with health stressors, although problem-focused coping is also used in these episodes (Folkman and Lazarus, 1980).

Education and income also appear to correlate positively with use of active-behavioural coping and with behaviours that are effective in alleviating distress (Billings and Moos, 1980; Fleishman, 1984; Pearlin and Schooler, 1978). Emotion-focused coping has also been related to certain personality variables such as self-denial (Fleishman, 1984).

1.7.4 Intra-versus inter-individuality, stability and variability in coping strategies

Intra-individual differences in coping patterns present a further problem in coping research and people tend to be more variable than consistent in their coping patterns (Folkman and Lazarus, 1980). Variability may arise from the context in which coping occurs and in personal characteristics such as beliefs about the world, goals, coping resources and skills (Folkman, 1992).
The aim of coping assessment is to achieve both reliability (precision, multidimensionality and variability of the coping process) without sacrificing validity (Folkman, 1992). Several self-report multidimensional coping assessment tools now exist, allowing empirical analysis of cross-situational coping efficacy, including the Ways of Coping Inventory developed by Folkman and Lazarus (1985) and the COPE (Carver, Scheier and Weintraub, 1989). Such situation-oriented assessments minimize possible biases arising from memory distortions or personal theories and can allow the transactional theory of coping to be tested.

1.7.5 Other sources of bias in coping research

One disadvantage of assessing specific thoughts and behaviours to cope with problems is that specific coping items may serve multiple functions and thus load on more than one factor scale (Stone and Kennedy-Moore, 1992). An alternative approach adopted by Carver et al. (1989) is to assess coping constructs (such as distraction) which are at a higher level of abstraction and which would hopefully enhance internal consistency and be amenable to factor analysis. Reports of the type and amount of coping may also be biased by the individual’s opportunity to cope with the problem and the duration from when the problem first occurs to when coping is first reported (an issue which remains to be addressed in coping research). An individual’s knowledge of how successfully an event was resolved (“encounter resolution”) may induce further bias and requires prospective designs to overcome. Differences in the type of coping stages experienced (such as the preparatory, acute or recovery stages); variation in the ceiling levels of coping scores referring to different types of problems and between-subject variability in meanings of the coping assessment response key (where subjects are asked to rate the extent they used each strategy (from "not at all" to "a lot") may also lower reliability or induce measurement of error in terms of frequency, duration or usefulness.

A further issue relating to coping research is that the usual standards for internal consistency (the traditional test of reliability) need to be revised to
accommodate for human variability in the choice of coping strategies of the same type. Folkman (1992) thus considers reducing the standard Chronbach alpha coefficient from 0.90 to 0.70. The internal validity of coping measures has also been criticized (Stone and Kennedy-Moore, 1992) due to use of factor analysis to define categories of coping items which eliminates possibly important items that fail to load on a single factor. However, such categories are at least derived from empirical methods and from theory. There are therefore many methodological issues to consider in attempting to analyze individuals' coping strategies. As Folkman (1992) concludes, what is ultimately needed in coping research is "reliable and valid measures to describe a process that is inherently subtle, dynamic and complex." In addition, a combined microanalysis of coping processes and macroanalysis of styles of coping should help yield the most satisfactory analysis of short- and long-term outcome (Lazarus and Folkman, 1984).

1.8 Prevalence of hand injuries

Hand injury is a significant source of morbidity in the working population due to its frequency and high average number of return visits compared to other types of injury. Hand injury is possibly a person's most frequently injured part (Haese, 1985). In a study of over 4,000 occupational injuries in the United States in 1988, hand and finger injuries accounted for 30% of all episodes of work-related injuries treated: 20% resulting from a crushing motion and nearly 10% from fractures or amputations (Oleske and Hahn, 1992). The average cost per injury has been estimated at £474 in Ireland (O'Sullivan and Colville, 1993). Despite these high incidence rates, there is little published research on the psychological status of individuals sustaining such injuries.

1.8.1 Psychological significance of hand injuries

The hand serves not only as "a functional unit necessary for daily activities, but also as a sensory unit supplementing and complementing the other sensory
organs such as the eyes, ears and nose," a nonverbal means of communicating certain feelings and emotions (Cohney, 1978) and is a tool for using written and printed symbols (Mendelson, Burech, Polack and Kappel, 1986).

Cone and Hueston (1974) state: "The hand is an exquisite sensory organ, an important part of an individual's self-concept, and often the vehicle of expression, attachment and contact between himself and his environment." Injuries or loss of part of a hand or both hands are thus psychologically significant and can produce "severe psychological sequelae" (Cohney, 1978) because of subsequent functional loss and changes in self-image. Hand injuries are often accompanied by "real or threatened losses, or both, related to function as well as social acceptance" (Grunert, Smith, Devine, Fehring, Matloub, Sanger and Yousif, 1988c, p.177) and defence mechanisms such as denial (allowing individuals to reintegrate their disability and reformulate their self-image, but whilst perpetuating their frustration in attempting to adjust). The individual's earning capacity and family security are also often threatened (Cone and Hueston, 1974).

However, as Campbell, Gow and Hooper (1992) state: "the physical impairment is usually overestimated while the psychological aspect is given little consideration" (p.203) and Cohney (1978) considers hand deformities following injury to have "no less a psychological impact on the patient and his relatives than a deformity of the face..."(p.578).

1.8.2 Specific characteristics of hand injury

Hand injuries have also been distinguished from other types of injury in that the person typically watches the injury occur; the injury is immediately seen after its occurrence; the hand injury is constantly in public view and thus a conspicuous injury; the hands are seen by the person more than any other body part and are an ongoing reminder of having sustained an injury (Grunert and Maksud, 1993).

Moreover, since hand function is important in heightening tactile experience and conveying emotion in sexual intimacy, sexual dysfunction (categorized as
either impotence, reduced sexual desire and marked rejection of sexual contact by the partner) has been reported in 19% of 120 individuals with severe hand injuries, the majority of whom had amputations of one or more digits (Grunert, Devine, Matloub, Sanger and Yousif, 1988b).

1.8.3 Factors that may influence psychological reactions to hand injury (subjective reports)

The reaction to hand injury has been likened to the pattern of grief and mourning, characterized by an initial denial and disbelief, with associated numbness and absence of emotion. This is followed by depression and disorganization (involving a sense of emptiness, agitation and despair, childlike helplessness, anger and blaming and distorted memory or amnesia). During restitution and rehabilitation, the person develops a more optimistic view of themselves, their hand injury (which may now be seen as a challenge) and their future. A final phase of overcompensation may arise with increased activity and performance (Cone and Hueston, 1974). Similar psychological reactions of grief and depression, numbness (or blunting of physical and mental feeling); distress and pining for the lost limb; fear (for example, about future work); tension, insomnia and loss of appetite are present in individuals who have lost a limb (Parkes, 1971).

Cone and Hueston (1974) suggest that adaptation to hand injury is determined by the person’s personality organization, the meaning of the hand to the individual, racial and cultural expectations about loss and treatment, available social support and the person’s ability to mobilize it, age (people during their development phases being better able to cope with changes in body image), prior unresolved losses and secondary psychological gain in which gratification of pathological needs produces maladaptive behaviour.

Furthermore, it is suggested that surgical and functional outcome are influenced by the nature of the injury (Cone and Hueston, 1974). An injury sustained when people are unconscious or if they are not allowed to see the injured hand, will promote denial, whilst if the injury is perceived as
stemming from their own actions they will make a better rehabilitation than if they project the blame onto an employer. Guilt or hostility may often be associated with pain.

Traumatic finger or hand amputations also affect personal body image and may lead to a feeling of being incomplete or feelings of alienation or dissociation (Mendelson et al., 1986). Grant (1980) reports that the loss or mutilation of a hand seriously compromises the individual's inner image, causing reverberations throughout the psyche.

According to Nerenz and Leventhal (1983) a sense of alienation or detachment of the mind from the body ("depersonalization") may be one of the emotional reactions arising from a discrepancy between seeing and thinking (for example, feeling pain in the arm but knowing the arm is amputated). This representation of an illness problem is believed to involve both abstract (conceptually processed) and concrete (schematically processed) mechanisms which direct and guide coping and which may be acute, cyclic or chronic representations. These representations may relate to the self either as in total (the self is the disease, the disease is self); encapsulated (a component of the self is diseased) or risk (the self faces a constant threat of acute outbursts of illness).

All the affective reactions experienced after severe hand trauma are associated with a loss of "personal invulnerability" (Grunert and Maksud, 1993, p. 75), as people often believe the accident is due to factors beyond their control, disturbing a belief that the world is a safe place.

Fear of ridicule because of the disfigured hand and fear of difficulties in dating are also reported in people with hand injuries (Sheehan and Wathen, 1982) for whom their injury may also have spiritual implications.

Psychological symptoms following severe hand injury do not appear to be maintained by litigation (Grunert, Matloub, Sanger, Yousif and Hettermann, 1991). Moreover, anatomical defects of hand injuries are not always proportional to the functional and psycho-social repercussions (Seye, Bassene, Camara and Pouye, 1987), thus questioning the nature of other mediating variables which affect outcome.
Despite these high incidence rates and the psychological significance of hand injuries, there is little published research to date on the role of coping styles in the psychological functioning of individuals with hand injuries.

1.8.4 Empirical investigations of psychological reactions following hand injuries

Whilst general descriptions of the individual’s reactions to physical injuries provide useful information, detailed scientific studies are important to highlight how individuals can be helped to cope with their disabilities.

Tsoi, Leung and Chow’s (1982) study of 20 semi-skilled Chinese workers with hand injuries caused by industrial accidents, found a significantly lower self-esteem in individuals who had suffered more severe disability compared to those who had suffered less disability. However, family support proved to be an important qualifying variable and was more lacking for the severe hand injury group who were also under family pressures. Moreover, there was no follow-up of the interviews (which occurred within one month of being discharged from hospital) thus precluding any causal relationships to be made.

In a study of 67 individuals with work-related hand injuries resulting in amputation, significant functional loss and cosmetic scarring (or both) Grunert et al. (1988c) report a high incidence of psychological symptoms within the five days following injury, with 94% displaying one or more PTSD symptoms, most commonly nightmares (occurring in 92% of patients); flashbacks (88%); affective lability (84%); preoccupation with phantom limb sensation (13%); concentration/attention problems (12%); cosmetic concerns (10%); fear of death (5%) and denial of amputation (3%). At a two month follow-up, a fairly high proportion (63%) of patients still had flashbacks and 48% of patients still reported affective lability, whilst nightmares, fear of death, denial and concentration/attention problems reduced significantly. Only cosmetic concerns and preoccupation with phantom limb sensations increased, each rising to 17%.
Flashbacks are reported to be fairly pronounced and ritualized during the two months following the injury (Grunert, Devine, Matloub, Sanger and Yousif, 1988a) and have been reported as the most frequently maintained symptom. Thus, Grunert, Hagarten, Matloub, Sanger, Hanel and Yousif (1992b), found flashbacks in 50% of occupationally injured patients and 25% of nonoccupationally injured patients at a six month follow-up, whilst in Grunert, Devine, Matloub, Sanger, Yousif, Anderson and Roell's (1992a) study of 170 patients, these symptoms continued to be significantly debilitating at 18 months after injury, falling from an initial 80% within five days of the injury to 39% at 18 months.

Flashbacks are frequently accompanied by affective disturbances such as anxiety and depression. Thus, in Grunert et al.'s (1992a) study, generalized anxiety was fairly prominent in nearly half (48%) within five days post injury, declining steadily to 31% at three months, 20% at six months and 5.9% at 18 months, whereas depression was more frequent and persistent, initially occurring in 62% of individuals, 45% at three months, 28% at six months, remaining in 14% of individuals at 18 months. Although follow-up data were provided in this study, assessment consisted of a "semistructured psychological evaluation" and no objective standardized assessment techniques are mentioned, thus questioning the reliability and validity of these results. Moreover, whilst frequent, successive follow-up data are provided, no conclusions about the cause-effect relationship were made.

These symptoms of guilt, depression, anger and anxiety, behavioural changes and sleep disturbance, appear to be characteristic symptoms following distressing events such as accidents which may continue for months or even years and are comparable to symptoms of PTSD (Brom et al., 1993).

1.8.5 Causal attributions

Grunert et al. (1992b) analyzed individuals' perceived causes of their injury in terms of four categories: causes due to a specific attribute of the individual; transient or situational factors; specific attributes outside the individual (for
example, lack of machinery guards) and transient or situational factors outside the individual. These categories varied on two dimensions: whether the cause was internal (causes the individual could alter) or external (causes requiring some changes in the environment and thus perceived as beyond personal control in terms of prevention); stable (likely to result in future injury) or unstable. More individuals in the occupationally injured group (over 80% of individuals) attributed their injury to external factors (such as lack of safeguards). Attributions to personal error reduced from 46% at the initial screening to 6% at a six month follow-up; whilst causal ratings for nonoccupationally injured adults barely changed from an initial 71% attributing injuries to personal error or fatigue. According to Grunert et al. (1992b) this high proportion of individuals with occupational injuries attributing their injury to external factors suggests that they "believe they had very little control over the circumstances that resulted in their injuries..."(p.199). However, it seems possible that the findings in the occupational injuries group may, alternatively, be accounted for by individual attempts to gain financial compensation. Moreover, no attempt was made in the above studies to correlate causal attributions or degree of avoidance, flashbacks, anxiety, depression or other psychological variables with psychological adjustment or outcome.

Grunert et al. (1992b) also assessed avoidance, revealing reactions towards individuals' working environments in which they were injured in approximately 68% of non-occupationally injured adults initially and in 61% six months later; compared to 48% in the occupationally injured group at an initial interview and 83% at six months although, again, no standardized instrument such as the Impact of Event Scale (IES) was employed.

1.8.6 Other psychological variables

Whilst there is a paucity of published research to date on the role of coping styles in the psychological functioning of patients with hand injuries, a retrospective study by Lee, Ho, Tsang, Cheng, Leung, Cheng and Lieh-Mak
(1985) interviewed Chinese male factory workers with hand injuries two to three years after their hand injury. Their findings differentiated between an "adjusted" group (associated with an internal locus of control, more active involvement in social activities and a higher level of expressed satisfaction) and "a less well adjusted" group (with correlates between high GHQ scores and external locus of control, less social activities and dissatisfaction with social life). The patient group showed significantly higher scores on the GHQ and were more externally oriented compared to a control group of male workers. Lee et al. (1985) suggest that locus of control can be considered as "a coping resource to moderate the outcome of one's struggles with life's stresses" (p.495). Nevertheless, since no pre-injury data were available, it is possible that the patient group was more poorly adjusted prior to their injuries which could have contributed to their injuries. A further follow-up might also highlight the possible existence of different stages of adaptation post-injury.

1.8.7 Coping styles in general accident victims

A more detailed, longitudinal investigation of coping strategies and the interrelationship with injury and personality variables was conducted by Malt (1992) on 20 hospitalized male accident victims (of unspecified cause but excluding head injury) using standardized assessment schedules, including the Ways of Coping Checklist and Impact of Event Scale (measuring intrusion and avoidance symptoms relating to the accident). A stronger relationship between emotion-focused coping and psychopathology (depression) and emotional adjustment, than between coping and injury severity emerged, whilst emotion-focused coping showed the strongest relationship to psychopathology at the time of the injury. Correlations were also found between emotion-focused coping during hospitalization and at follow-up but no such correlation was found for problem-focused coping, indicating that "the emotional coping efforts are fixed patterns of behavioral responses that are used across different situations" (Malt, 1992, p.143). Avoidance and intrusion were also significantly related with emotion-focused coping and avoidance coping was positively
related to greater symptom complaints. Several items were found to predict complications (coping failure) including the items: "I bargain or compromise to get something positive from the situations"; "I hope a miracle would happen..." "I refuse to believe it has happened," "I get mad at the people or things that caused the problem" and "I make a plan of action and follow it." These coping efforts were described as "too active coping efforts" in situations where "one just has to accept fate." Malt (1992) concludes: "It is probably flexibility that identifies the good coper. The poor coper applies the same coping efforts across different situations." (p.144).

From the longitudinal nature of Malt’s (1992) study and the use of objective assessment interviews, the results thus appear to be reasonably valid. These findings may also have cross-sample validity, since Folkman, Lazarus, Dunkel-Schetter, DeLongis and Gruen (1986) identified similar coping efforts to be associated with poor outcome in daily living, in particular, confrontive coping (including strategies such as "I expressed my anger to the person who caused the problem" or "stood my ground and fought for what I wanted") as opposed to planful problem-solving (including strategies such as "I made a plan of action and followed it") which was associated with satisfactory outcomes. However, no causal relationships can be concluded from the above analysis which can only be addressed by cross-lagged panel analysis. This issue of causality is important in deciding how to intervene in maladaptive appraisal-coping outcomes.

1.8.8 Implications for investigating the interactions between coping styles, PTSD reactions and psychological distress

Knowledge about the interactions between coping styles, PTSD reactions and psychological distress in this client group may have important therapeutic implications in identifying potentially adaptive or maladaptive coping strategies and appropriate psychological interventions necessary for optimal rehabilitation.
Appropriate information might be obtained regarding potential psychological reactions after a hand injury. Such information should provide reassurance about the normality of such physical or psychological symptoms, help diminish secondary symptoms such as worry about these reactions (Brom et al., 1993) and minimize avoidance enabling exposure to fear-provoking stimuli. Additional help might consist of recommendations regarding potentially adaptive or maladaptive ways of coping or combinations of coping strategies, as well as advice to avoid identified negative coping strategies and to utilize positive coping strategies to enable the most beneficial outcome. Alternatively, since distress seems to interfere with the use of the proposed adaptive problem-solving strategies, help might focus on working through those distressing emotions underlying the use of emotion-focused coping to enable use of more adaptive strategies.

In addition, relevant risk factors such as specific circumstances surrounding the event, social support and appraisal, may generate useful information for medical and nursing staff. By indicating those individuals most at risk of developing severe emotional reactions, prompt psychological assistance can be sought to minimize the likelihood of serious disorders from developing.
2.1 Outline of the present study

Evidence therefore exists from studies of various stressor types that psychological distress following physical trauma is better accounted for by reference to personal meaning than to a fright-model inherent in the post-traumatic stress criteria of DSM-III-R. Accordingly, the present study was designed to extend the analysis of previous studies of hand injuries and general accident victims, by investigating the psychological reactions and coping strategies employed in a group of individuals with hand injuries and the interrelationship between coping strategies, PTSD symptoms, psychological functioning and cognitive appraisal, in addition to the proposed distinction between emotion- and problem-focused coping in relation to outcome.

An attempt was made to expand the research of previous studies of hand injuries by testing whether the hypothesized positive impact of problem-focused coping and the negative impact of emotion-focused coping on psychological outcome, evident in post-war veterans (Solomon et al., 1988a; Blake et al., 1992; Fairbank et al., 1991 and Nezu and Carnevale, 1987) and the negative impact of emotion-focused coping and avoidance coping in accident victims (Malt, 1992) applies to individuals with traumatic injuries to the hand. It was also hoped to extend the analysis of Mikulincer and Solomon (1989) by addressing the direction of causality between coping and psychological variables, necessitating a longitudinal study. To increase the implications for clinical work, a mixture of quantitative and qualitative analysis was intended to examine salient issues such as the presence or absence of ameliorating factors (such as social support).

In order to investigate the impact of hand trauma, a comparison group consisting of individuals with a hand deformity arising primarily from Dupuytren's contractures, from carpal tunnel syndrome (in one individual) and from rheumatoid arthritis (which was not affecting any other area of the body) and nerve compression in another two individuals. These individuals
were thus comparable in terms of the body site of injury and dysfunction but differing in that their problems were not induced by traumatic injury.

**Dupuytren's disease: nature and aetiology**

Dupuytren's disease is a fibroproliferative disorder commonly resulting in flexion deformities affecting the metacarpophalangeal and proximal interphalangeal joints of the fourth and fifth rays (Mitra and Goldstein, 1994) which may produce variable degrees of disability from an inability to extend the ring metacarpophalangeal joint to a completely closed hand (Scott, 1978). There is strong evidence of a genetically-determined predisposition to the condition which may be an autosomal dominant trait (whereby individuals with a high diathesis for the disease are young men between 20-30 years of age in whom nodules develop early and in several locations and those with a low diathesis tend to be older men of 50-70 years of age in whom nodules develop late with a lower need for surgery and a lower rate of recurrence (Mitra and Goldstein, 1994)). However, whilst some reports have suggested that identical twins will develop identical contractures, Lyall's (1993) report of two pairs of identical twins in which only one twin has the disease, suggests that a genetic background is inadequate of itself without an additional environmental trigger.

### 2.2 Aims

1. To investigate the interrelationship of coping styles, cognitive appraisal, PTSD symptoms and psychological functioning in individuals with hand injuries compared to a comparison group of individuals with hand deformities.

2. To analyze the direction of effect between variables and explore the types of coping styles used by individuals with and without PTSD.
2.21 **Hypotheses**

1. Individuals who have sustained traumatic hand injuries will exhibit greater psychological distress (as shown by significantly more PTSD symptoms (on the PTSD-I, Watson, Juba, Manifold, Kucala and Anderson, 1989), intrusion and avoidance on the IES (Horowitz et al., 1979), anxiety and depression on the Hospital Anxiety and Depression Scale (HAD, Zigmond and Snaith, 1983) and negative affect on the Positive and Negative Affect Scales (PANAS, Watson, Clark and Tellegen, 1988) compared to individuals in the comparison group with hand deformities.

2. A coping style characterized by greater use of emotion-focused strategies and an under-reliance of problem-focused techniques, will be related to greater psychological distress in individuals with hand injuries than a coping style characterized by a predominant use of problem-focused strategies and less use of emotion-focused coping (as shown by a stronger, positive relationship between mean emotion-focused coping scores on the COPE (Carver et al., 1989) and post-traumatic stress disorder symptoms (on the PTSD-I, Watson et al., 1989), intrusion and avoidance on the IES, (Horowitz et al., 1979), anxiety and depression scores on the HAD (Zigmond and Snaith, 1983) and negative affect scores on the PANAS (Watson et al., 1988).

3. Emotion-focused coping leads to greater psychological distress than problem-focused coping. This will be shown by a positive and stronger correlation between emotion-focused coping (COPE) scores at time 1 and scores on the PTSD-I, IES, HAD and Negative Affect Balance scale at time 2 compared to the correlation between problem-focused coping (COPE) scores at time 1 and these same scales at time 2, in addition to a larger correlation between mean emotion-focused coping (COPE) scores at time 1 and scores on the PTSD-I, IES, HAD and Negative Affect scales at time 2 compared to that between scores on the PTSD-I, IES, HAD and Negative Affect scales at time 1 and emotion-focused coping (COPE) scores at time 2.
4. Appraisal of greater threat will be positively related to both psychological distress and emotion-focused coping but negatively related to the use of problem-focused coping (Lazarus and Folkman, 1984), as proven by a positive correlation between mean ratings of the perceived threat of the individual's experience and scores on the PTSD-I, IES, HAD, overall ratings of "emotional disturbance," Negative Affect scale and emotion-focused coping (COPE) scores and a negative correlation between perceived threat ratings and problem-focused coping (COPE) scores.

5. Subjective ratings of coping efficacy will be positively related to use of problem-focused coping techniques, as measured by visual analogue self-ratings on coping and mean problem-focused coping (COPE) scores.
2.2 Design

A combined between-subjects analysis (in analyzing the effects of the independent variables of trauma versus non-trauma and coping strategies, on the dependent variables of psychological distress and symptomatology) and within-subjects analysis (in assessing the changes in coping strategies used, distress and symptomatology over time).

Individuals were interviewed at two time intervals: time 1 and time 2. Follow-up interviews at time 2 were undertaken at an average of 4.6 months for the hand injury group and 4.2 months for the comparison group.

The design of the study was thus longitudinal and correlational.

A cross-sectional sample of individuals with hand injuries was chosen, including varying intervals since the initial injury (the majority of individuals being interviewed between six days to four weeks post-injury); two at seven to eight weeks and four at a longer duration over 10 months (two at 10-11 months; one at two and a half years and one at three years).

2.3 Participants

Participants for the study consisted of a "hand trauma" group of 20 individuals who had sustained a hand injury and a comparison group of 20 individuals with a non-traumatically induced deformity of the hand (primarily due to Dupuytren's contractures (in 17 individuals); carpal tunnel syndrome (one individual); rheumatoid arthritis affecting the hands (one individual) and deformity due to nerve compression (in another individual). An additional five individuals with hand injuries were interviewed producing a total of 25 individuals with a hand injury. Participants in the two groups were matched for sex (with three females and 22 males in the hand injury group and two females and 18 males in the comparison group). An attempt was also made to match for age. However, most of the comparison group consisted of individuals over the age of 60 (ranging from 42 to 77 with a mean of 60.8 (S.D. 9.8) years, whereas the hand injury group consisted of individuals ranging from 19 to 61 with a mean of 38.9 (S.D. 13.3).
The critical variable for control was for the traumatic injury. Thus, the comparison group were roughly comparable in terms of site of injury and dysfunction. They were also receiving care from the same team of professionals although one person in the comparison group had been operated on by another Consultant. All were Caucasian in origin.

Educational, occupational and marital status was also established at the outset of the study. There was little difference in the number of years of education (11.2 for the hand injury group (S.D. 1.8), versus 10.6 (S.D. 2.0) for the comparison group). The marital and occupational status of each group are shown in Table 1.

<table>
<thead>
<tr>
<th>Marital status</th>
<th>Hand injury group (N=25)</th>
<th>Comparison group (N=20)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Married</td>
<td>14</td>
<td>18</td>
</tr>
<tr>
<td>Divorced</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Single</td>
<td>8</td>
<td>1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Employment status</th>
<th>Hand injury group</th>
<th>Comparison group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Driver</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Machine operator</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>Joiner/carpenter</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>Other manual work</td>
<td>6</td>
<td>2</td>
</tr>
<tr>
<td>Engineer</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Housewife</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Office work</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>Teacher</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Retired</td>
<td>1</td>
<td>8</td>
</tr>
<tr>
<td>Student</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Unemployed</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Other professional</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>
Nineteen individuals of the hand injury group were employed (with one housewife) and 11/20 sustained injuries in the workplace. The remaining injuries occurred at home or in the garden including one caused by a firework explosion and another caused by a bomb explosion. There was a predominance of manually skilled workers in both groups although more individuals were retired in the comparison group.

Inclusion criteria were that participants were over the age of 18 years; had no history of severe psychiatric illness, neurological disease including dementia, alcoholism or head injury. The hand injury group consisted only of persons who had suffered from an amputation (or partial amputation) of a thumb or one or more fingers, the hand or arm (in three individuals). Individuals with crush, avulsion or nerve injuries, or individuals with Dupuytren's disease who had no or minimal dysfunction were not included. One individual with Dupuytren's disease was excluded from participation due to having sustained a recent hand injury and one individual with a hand injury was excluded due to suffering from a mental illness for several years.

All individuals (in both groups) were right handed. One individual in each group was ambidextrous but wrote with the right hand. The dominant hand was affected in 12/25 of the hand injury group and 10/20 of the comparison group.

Many individuals with Dupuytren's contractures had already undergone unsuccessful repair of their condition in the past or successful repair of the other hand.

Table 2 categorizes the type of injury and length of time since injury in the hand trauma group, showing that the most severe injury involved partial or complete amputation of the arm (the whole arm in one person and below the elbow in another). The most prevalent injury involved amputation of one or more fingers (in 12 individuals), followed by partial amputation of one or more fingers (six individuals). Three individuals sustained an amputated hand: in one case the hand was successfully replanted.
Table 2  

Type of hand injury and duration of injury  

(N=25)

<table>
<thead>
<tr>
<th>Type of injury</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Amputation of arm</td>
<td>2</td>
</tr>
<tr>
<td>Amputation of hand</td>
<td>2</td>
</tr>
<tr>
<td>Amputation and replantation of hand</td>
<td>1</td>
</tr>
<tr>
<td>Amputation of one or more fingers (includes some partial replantations)</td>
<td>12</td>
</tr>
<tr>
<td>Amputation and replantation of thumb</td>
<td>2</td>
</tr>
<tr>
<td>Partial amputation of one or more fingers</td>
<td>6</td>
</tr>
</tbody>
</table>

Length of time since injury

<table>
<thead>
<tr>
<th>Length of time since injury</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>6 days - 4 weeks</td>
<td>18</td>
</tr>
<tr>
<td>7-8 weeks</td>
<td>3</td>
</tr>
<tr>
<td>10-11 months</td>
<td>2</td>
</tr>
<tr>
<td>2 1/2 years</td>
<td>1</td>
</tr>
<tr>
<td>3 years</td>
<td>1</td>
</tr>
</tbody>
</table>

As shown in Table 2, the majority of individuals were initially seen six days to four weeks after their injury. An additional three participants were seen at a much longer duration of injury (two at 10-11 months, one at two and a half years and another at three years) both due to an anticipated lack of availability of individuals and as a matter of clinical interest.

Duration of hand condition in the comparison group were of one year (four individuals); two years (five individuals); three years (one individual); four years (one individual); five years (two individuals); eight years (one individual); 10 years (two individuals); 13 and 14 years (each one individual) and 20 years (two individuals), with a mean duration of 6.3 years (S.D. 6.2).

At the first interview (time 1), five individuals with hand injuries had received psychological advice from a Clinical Psychologist (whom one had seen several times and the others only once). One had been prescribed anti-depressant
medication two weeks after the injury (which had been discontinued by the
time of participation in this study four weeks post-injury).
Several individuals in both groups also received regular or intermittent
physiotherapy and/or occupational therapy between interviews at time 1 and
time 2.

2.4 Procedure
2.41 Pilot study
Preliminary discussions were undertaken with several people with hand
injuries and with both Dupuytren’s disease and rheumatoid arthritis.
After obtaining ethical approval for the study from Frenchay Research Ethical
Committee and Cheltenham and District Health Authority (in case additional
comparison participants were needed), aspects of the questionnaire were
pilotted on one person with a hand condition and one person with a hand
injury and the entire interview was pilotted on another individual with a hand
injury. This led to a rephrasing of the word “threatening” (of which one
person was uncertain of the meaning) to “threatening or unnerving” in
question 4 of the semi-structured interview. No other ambiguities were
highlighted and piloting confirmed that the interview took an appropriate
time (45 minutes) to complete.

2.42 Main study
Timing and location
Participants were interviewed between the beginning of May 1994 and February
1995. Individuals with hand injuries and deformities at Time 1 were
consecutively recruited from the Hand Clinic or from the inpatient ward at
Frenchay Hospital. The hand clinic is the largest of its type in the area,
including a team consisting of a hand and plastic surgeon, physiotherapists and
occupational therapists, with a catchment area including Avon,
Gloucestershire, Hereford and Worcester, Somerset and the South West region.
Most interviews took place on a Friday or Thursday on the same day as the Hand Clinic and either in a private clinic room within the Hand Therapy department or on the inpatient ward.

Individuals were initially recruited as they attended the Outpatients department (or after consultation with the ward staff about present inpatients with hand injuries or Dupuytren's contractures).

Case notes of attenders to the Hand Clinic that day were reviewed and details of possible appropriate participants recorded.

**Explanation of the study**

An introduction and verbal explanation of the nature of the study was then given to these individuals (on attending the Clinic). They were asked whether they would be willing to participate in the study, explaining briefly that it involved a study of coping reactions in people who have suffered from injuries to the hand compared to people who suffer from some other condition affecting the hand.

For those interested in taking part, the nature of the study was explained (as per Information sheet, Appendix 1, which adhered to Ethical Committee guidelines) and an opportunity was given for any further questions to be answered before a decision as to whether to take part in the study or not was reached. Reassurance regarding complete anonymity was given.

On obtaining verbal consent, written informed consent to participate was obtained (see Appendix 2: Consent form). For most individuals the first interview was made to coincide with their outpatient appointment to see the Consultant. Two of those with hand injuries were seen whilst on the ward receiving inpatient care, but only after a week's postoperative interval had elapsed to ensure recovery from the effects of the general anaesthetic.

As expected, most of those with Dupuytren's contractures were in the process of undergoing surgical repair of the condition which typically involved a local anaesthetic block in the arm.
Although it was hoped to interview all individuals with Dupuytren's contractures prior to any recommended surgery, due to a shortage of numbers, eight were seen as inpatients, one was seen pre-operatively and seven post-operatively (ensuring a day interval had elapsed following the local anaesthetic).

Whilst this might seem to confound the comparison for dysfunction, the post-operative procedure involved gradual rehabilitation, physiotherapy and the hand being placed in a splint at night for six to nine months. In addition, following surgical repair some residual dysfunction typically remains and those who had undergone surgical repair in the previous month or more, still had dysfunction of one or more fingers.

Three potential participants with a hand deformity and one person with a hand injury declined to take part in the study.

Content of interviews

Participants were asked the "additional information" (see Appendix 3) following which they were asked questions from a semi-structured interview (see Appendix 4) and the following questionnaires: the PTSD Interview (PTSD-I, Watson et al., 1991: Appendix 5); the Impact of Event Scale (IES, Horowitz et al., 1979: Appendix 6); the Hospital Anxiety and Depression scale (HAD, Zigmond and Snaith, 1983: Appendix 7); followed by a single question assessing how much what had happened to them as a result of their hand injury or hand condition had disturbed their overall emotional state from "not at all" to "extremely" on a visual analogue scale of 0-100 (Appendix 8); the Positive and Negative Affect schedule (PANAS, Watson et al., 1988: Appendix 9); the COPE inventory (Carver et al., 1989) and questions on completion of the COPE (Appendix 10).

The PTSD-I was completed according to the effects of the hand injury or hand condition by substituting the words "hand injury" or "hand condition" for "stressor" for each item (even though nine individuals in the hand injury
group and seven of the hand comparison group reported previously distressing events such as divorce or a child being involved in an accident).

Opportunity was also allowed for additional comments in between questions on the semi-structured interviews.

This initial interview lasted approximately 50-60 minutes. Questions were introduced using the same standardized statements (as outlined in the above Appendices). Questions were read aloud and responses recorded by the interviewer. All individuals were able to complete the visual analogue scales and most completed the HAD and PANAS scales independently except for those individuals who had difficulty in writing due to their dominant hand being affected.

Each of the 53 items on the COPE inventory was typed (in black lowercase letters measuring 4 mm x 2 mm) onto white index cards measuring 127mm x 76 mm which were then presented individually to enable statements to be read one at a time.

The interviewer remained present throughout this time and provided sensitivity to each participant's possible distress in asking questions. Consequently, for several individuals in distress over their hand injury, interviews lasted up to 90 minutes. At the end of each interview, participants were given the opportunity to ask any questions and were thanked for their time and help.

Follow-up interview

An attempt was made to conduct all second interviews at a four to six month interval and by face-to-face contact. However, contacting some individuals either by telephone or letter to make a suitable further appointment proved difficult, whilst others had difficulty in attending the Department or in taking time off work. Since individuals were already familiarized with the questionnaires and after discussing this issue with two experienced clinicians, it seemed sensible to obtain the second interviews via postal returns. Participants were interviewed (or questionnaires obtained) between three and six months
after initial interview except for one participant in each group who completed the interview at seven months. Follow-up interviews or questionnaires were made at an average of 4.6 months (S.D. 1.0, range 3-7 months) for the hand injury group and 4.2 months (S.D. 1.1, range 3-7 months) for the comparison group. Face-to-face interviews were conducted for 13 of 25 participants in the hand injury group, and 11 completed questionnaires via postal return, whilst in the hand comparison group, 13 individuals were interviewed face-to-face and four completed questionnaires via postal return.

One person in the comparison group was unable to complete further questionnaires due to time pressures and another individual with Dupuytren's contractures was not on the telephone and was unable to be contacted by letter despite several attempts. A third individual in the comparison group and two individuals with hand injuries failed to return the questionnaires. Thus, at time 2 data were available from 23 individuals in the hand injury group and 17 individuals in the comparison group.

Face-to-face interviews were conducted in the same room in Frenchay hospital with the exception of one individual in each group (who were interviewed on an inpatient ward at the hospital where they had undergone a further operation for their hand conditions) and one individual with a hand injury (who was interviewed in his present accommodation at a residential unit).

Follow-up interviews involved the same measures and procedure as used at time 1 with the exception of a shortened version of the preliminary information to be obtained (see Appendix 12). For individuals who completed the questionnaires by postal return, questions for the COPE were typed out on a sheet (see Appendix 13) instead of using card presentation.

Participants were again thanked for their time and help.

2.5 Measures

1. Semi-structured interview

The semi-structured interview was devised to assess the individual's subjective appraisal of how much their hand injury/hand condition mattered to them;
their control over the accident/onset; the degree of threat; predictability; impact on self-confidence; social support received and its helpfulness on a scale of 0-10 and other factors perceived to be relevant by the individual.

2. PTSD symptoms

(i) PTSD Interview (PTSD-I: Watson et al., 1991)

The PTSD-I (Watson et al., 1991) has been supported as a measure of post-traumatic stress disorder consisting of 17 items (responded to on a 7 point Likert-type scale from 1 (no or never) to 7 (extremely or always) that correspond closely to DSM-III-R criteria. These items are subdivided into three categories (trauma re-experiencing; avoidance of stimuli associated with the trauma and increased arousal). A cut-off score is provided within each category, plus an overall current and lifetime PTSD diagnosis and PTSD-I severity score.

The interview has robust test-retest reliability (total score $r = .95$; diagnostic agreement = 87%; internal consistency (alpha = .92); very high sensitivity ($= .89$), specificity ($= .94$), overall hit rate ($= .92$) and kappa = .84, with the Diagnostic Interview Schedule as a criterion (Watson et al., 1991).

Compared with 11 other representative psychometric PTSD measures, the PTSD-I has shown the highest average validity statistics as defined by kappa and overall hit rates (Watson, 1990). It seems to offer better convergent validity than the MMPI (Mississippi Scale for Combat-related PTSD, Keane, Caddell and Taylor, 1988) and it is also a versatile and efficient stress disorder measure (Watson et al., 1991).

The scale was modified slightly by rephrasing the wording in the first question of the summary section (A-1(b)) from "very uncommon and so horrible" to "sudden unusual, distressing event" and by including an additional question (A-1-(a)) about the degree of distress at the time of the hand injury/hand condition being made known to them.
(ii) Impact of Event Scale (IES) (Horowitz et al., 1979).

The Impact of Event Scale (Horowitz et al., 1979) has been devised to assess subjective distress for any life event and was used as an additional measure of post-traumatic distress. The scale consists of 20 items: nine items of intrusion (re-experiencing the event) and 11 episodes of avoidance (numbing and withdrawal) which are each assigned weights of 0 (negative endorsement), 1 (rarely), 3 (sometimes) or 5 (often), according to how frequently the events occurred within the preceding week.

These subscales have empirical validity (as shown by the emergence of coherent clusters); high split-half reliability of the total scale ($r = .86$); and high internal consistency of the subscales according to Cronbach’s Alpha (intrusion = .78; avoidance = .82); and test-retest reliabilities of .87 for the total stress scores; .89 for the intrusion subscale and .79 for the avoidance subscale, and supported sensitivity in assessing subjective distress after various life events (Horowitz et al., 1979).

The recommended cut-off point of over 19 on either intrusion or avoidance scores was used.

3. Psychological distress

(i) Anxiety and depression

Anxiety and depression was assessed by the Hospital Anxiety and Depression Scale (Zigmond and Snaith, 1983). The scale provides separate measures from an anxiety scale and a depression scale each of seven items which are selected to be relatively unaffected by concurrent physical illness.

For each construct a score above 10 indicates a probable disorder of relevant mood whilst 8-10 is "borderline."

The scale is readily completed and has been shown to have high internal consistency and satisfactory part-total correlation of all items (Snaith and Taylor, 1985) and to be a valid measure of the severity of anxiety and depression (Zigmond and Snaith, 1983).
(ii) **Visual Analogue Scale (VAS)**

A 0-100 mm visual analogue scale was used to assess disturbance of the individual's overall emotional state.

Such scales have been shown to have good discriminant ability and social validity (Bech, Malt, Dencker, Ahlfors, Elgen, Lewander, Lundell, Simpson and Lingjaerde, 1993).

(iii) **Positive and negative affect**

These two factors were measured by two 10-item mood scales rated on a 5-point scale from very slightly or not at all (=1) to extremely (=5) comprising the Positive and Negative Affect Schedule (PANAS, Watson et al., 1988).

Positive affect (PA) reflects the extent to which a person feels enthusiastic, active and alert (with high PA being a state of high energy, full concentration and pleasurable engagement) whereas negative affect (NA) is a general dimension of subjective distress and unpleasurable engagement subsuming aversive mood states such as anger, contempt, disgust, guilt, fear and nervousness (low NA being a state of calmness and serenity).

The two scales have been shown to be highly internally consistent (with high alpha reliabilities from .86 for PA and .87 for NA in an adult sample) and of .85 for PA and .91 for NA in a psychiatric inpatient sample. The scales also show validity with excellent convergent and discriminant correlations with lengthier measures of the underlying mood factors. They appear to be largely uncorrelated and were stable at appropriate levels over a two-month time period (suggesting that "even momentary moods are, to a certain extent, reflections of one's general affective level" (Watson et al., 1988, p. 1065).

Individuals were asked to indicate to what extent they had been feeling that way during the past week.

4. **Coping**

Coping strategies were assessed by the COPE, multi-dimensional coping inventory of Carver et al. (1989). This 53-item inventory consists of five scales...
(of four items each) measuring aspects of problem-focused coping (active
coping, planning, suppression of competing activities, restraint coping, seeking
of instrumental support); five scales of emotion-focused coping (seeking of
emotional social support, positive re-interpretation, acceptance, denial, turning
to religion) and three scales that measure less useful coping responses (focus on
and venting of emotions, behavioural disengagement, mental disengagement),
plus one item relating to alcohol-drug use. These latter three scales were also
labeled as "emotion-focused" by their similarity with items on the Ways of
Coping Checklist described by Folkman et al. (1986). Appendix 14 shows the
COPE scales and items categorized according to trait format and problem-
or emotion-focused strategies.

This inventory was chosen in view of the limitations of the Ways of Coping
Checklist (Folkman and Lazarus, 1985) which lacks a clear focus on some items
which are ambiguous and on which the scales were empirically rather than
theoretically guided. The COPE includes both theoretically- and empirically-
based scales and makes additional distinctions within the category of problem-
focused coping.

Alpha reliabilities for each scale have been found to be acceptably high at eight
weeks with a mean of .71 (S.D. = .12) with only one scale (mental
disengagement) falling below .6 and test-retest reliabilities at eight weeks are
relatively stable ranging from .46 to .86, mean .61 (S.D. = .11). Higher alpha
reliabilities were reported when rating specific behavioural situations than
general tendencies. With only two exceptions, items intended to comprise
separate scales were also found to load separately from each other as distinct
factors, whilst associations between personality dimensions including trait
anxiety and internality and other measures of coping styles (monitoring and
blunting) demonstrate both convergent and discriminant validity (Carver et al.,
1989).

Preliminary instructions were modified to a situational format and time-
limited version, where participants were asked to indicate the extent to which
they had used each statement to recently deal with the reaction to their hand
(on a scale of 1 to 4: 1 = I have not been doing this at all; 2 = I have been doing this a little bit; 3 = I have been doing this a medium amount and 4 = I have been doing this a lot).

Items were also converted to the situational form by rephrasing each item in present perfect tense ("I have been ..." rather than "I am").

5. Final semi-structured interview: appraisal of harm, threat or challenge; coping capacity and perceived helpful/unhelpful coping strategies.

Appraisal of the hand injury/onset of the hand condition was assessed by asking individuals how they would describe its occurrence:
(a) As a threat or danger or a source of worry as to how things would turn out;
(b) As loss of or harm to something of value to them or
(c) As a challenge or opportunity.

Another 0-100 mm VAS was used to assess how they felt they were generally coping with their hand injury/hand condition from "I am not coping at all" to "I am coping extremely well."

Respondents were also asked to describe the three most and least helpful methods of coping with their hand injury/hand condition.

2.6 Ethical considerations

The research was designed to comply with the ethical principles enunciated in the District Ethics Committee and in the Declaration of Helsinki (1993).

Participants were aware they were taking part in a research programme. Confidentiality of personal health information was preserved during the conduct of the research and it was ensured that no participant was identifiable from the results.

One participant who appeared to be experiencing considerable distress at the second follow-up interview was referred to a Clinical Psychologist for further help.
Chapter Three: Results

3.0 Data analysis

Preliminary scoring

Problem- and emotion-focused coping scores were first computed by calculating a mean and standard deviation for each of the 14 scales for each participant, plus a total mean and standard deviation for problem- and emotion-focused coping scores.

Computer analysis

Complete data for time 2 were obtained from 23 hand injury participants and 17 individuals in the hand comparison group.

Data were analyzed using the SPSS Macintosh computerized statistical package. Due to the use of multiple t-tests, Mann-Whitney U tests and correlations, results are according to the probability level of significance of 0.01.

All t-tests are two-tailed. Independent t-tests were used to compare differences in individual measures (due to unequal sample sizes) and the pooled variance estimate was chosen to yield a weighted average of sample variances. However, where preliminary analysis of skewness within either group showed a non-normal distribution, the Mann-Whitney U test was used. Wilcoxon's signed-ranks (matched pairs) test was used to assess within group differences.

Although data from the semi-structured interviews were ratings (on scales of 0-10) since they were numeric, they were treated as interval data in order to analyze interaction effects using multivariate analysis of variance).

Kendall's tau correlation coefficients were employed to analyze correlations between variables where the data were of non-normal distributions or showed kurtosis.

Previous stressful life events

During the 12 months prior to the first interviews, a slightly greater proportion of participants in the hand injury group experienced a stressful life event (such as divorce, separation, bereavement, job change or job loss, loss of social
contacts, financial or legal difficulties). Thus, 48% of the hand injury group compared to 35% of the hand comparison group reported having experienced one or more stressful life events during this interval. In both groups these events included primarily family illness, bereavements and financial difficulties. During the interval between time 1 and time 2, a relatively greater proportion of people in the hand comparison group (47%) had experienced one or more stressful life events compared to 30% of the hand injury group. In the hand injury group these events included three people who had changed or lost their job due to their injury. Two other life events (financial problems and moving house) related to the hand injury, whereas in the hand comparison group, life events were not directly related to the hand condition and tended to include bereavement, family or personal illness and stress at work.

3.1 Results analysis

3.1.1 Psychological distress at time 1 and time 2 in hand injury and comparison groups

Differences in psychological distress measures between the hand injury and comparison groups were calculated by independent t-tests. Separate t-tests rather than multivariate analysis of variance were used to examine group differences on the three PTSD-I categories due to the presence of different scales within each category.

The means and standard deviations of subjective ratings of distress (from 1-7), total scores of the categories of trauma re-experiencing (TR), avoidance (A), increased arousal (IA), total PTSD-I scores, intrusion (I) and avoidance (A) on the IES, anxiety and depression on the HAD, positive and negative affect on the PANAS, ratings of emotional distress (ED, on the VAS scale of 0-100) and impact on self-confidence (SC, on a 0-10 rating scale) are shown in Table 3.
Table 3  Means and standard deviations of measures of psychological distress for hand injury and comparison (C) groups at time 1 and time 2.

<table>
<thead>
<tr>
<th></th>
<th>Time 1</th>
<th></th>
<th>Time 2</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Injury (n=25)</td>
<td>C (n=20)</td>
<td>Injury (n=23)</td>
<td>C (n=17)</td>
</tr>
<tr>
<td></td>
<td>M (SD)</td>
<td>M (SD) z (or t)</td>
<td>M (SD)</td>
<td>M (SD) z (or t)</td>
</tr>
<tr>
<td>PTSD-I</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Distress</td>
<td>5.68 (1.44)</td>
<td>2.65 (1.87) z=-4.48**</td>
<td>5.87 (1.46)</td>
<td>2.47 (1.33) z=-4.78**</td>
</tr>
<tr>
<td>TR.</td>
<td>10.00 (5.85)</td>
<td>5.20 (1.67) z=-3.58**</td>
<td>9.35 (4.56)</td>
<td>4.47 (1.66) z=-4.27**</td>
</tr>
<tr>
<td>A.</td>
<td>16.32 (8.96)</td>
<td>9.45 (3.00) z=-3.18*</td>
<td>15.43 (8.61)</td>
<td>8.59 (2.37) z=-3.31**</td>
</tr>
<tr>
<td>I A.</td>
<td>14.92 (7.58)</td>
<td>9.55 (6.46) z=-3.51**</td>
<td>14.52 (7.48)</td>
<td>7.94 (2.94) z=-3.55**</td>
</tr>
<tr>
<td>Total</td>
<td>41.48 (19.15)</td>
<td>24.50 (8.65) z=-3.70**</td>
<td>39.30 (18.05)</td>
<td>21.24 (5.62) z=-4.11**</td>
</tr>
<tr>
<td>PTSD.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IES</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I</td>
<td>9.56 (6.91)</td>
<td>5.20 (8.31) z=-2.53 n.s.</td>
<td>7.26 (6.93)</td>
<td>2.00 (2.37) z=-2.93*</td>
</tr>
<tr>
<td>A</td>
<td>9.00 (8.64)</td>
<td>3.55 (5.62) z=-2.91*</td>
<td>6.74 (7.23)</td>
<td>2.12 (3.22) z=-2.82*</td>
</tr>
<tr>
<td>HAD</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anxiety</td>
<td>5.32 (3.15)</td>
<td>2.75 (2.57) t=2.95*</td>
<td>5.13 (3.84)</td>
<td>3.35 (3.08) t=1.57 n.s.</td>
</tr>
<tr>
<td>Dep.</td>
<td>2.96 (2.84)</td>
<td>2.50 (2.24) t=0.59 n.s.</td>
<td>2.87 (3.61)</td>
<td>2.17 (2.30) t=0.69 n.s.</td>
</tr>
<tr>
<td>PANAS</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PA</td>
<td>33.28 (6.82)</td>
<td>32.80 (5.51) z=-.07 n.s.</td>
<td>34.26 (8.37)</td>
<td>35.29 (6.92) z=-.33 n.s.</td>
</tr>
<tr>
<td>NA</td>
<td>20.36 (7.80)</td>
<td>14.65 (6.51) z=-2.92*</td>
<td>17.96 (7.58)</td>
<td>14.59 (5.20) z=-1.63 n.s.</td>
</tr>
<tr>
<td>E.D.</td>
<td>36.16 (25.45)</td>
<td>18.85 (30.47) z=-2.43 n.s.</td>
<td>34.52 (28.55)</td>
<td>11.82 (17.98) z=-2.84*</td>
</tr>
<tr>
<td>S.C.</td>
<td>3.36 (4.06)</td>
<td>1.80 (2.63) z=-1.14 n.s.</td>
<td>3.30 (3.20)</td>
<td>1.64 (3.04) z=-2.09 n.s.</td>
</tr>
</tbody>
</table>

TR :- trauma re-experiencing; A :- avoidance; IA :- increased arousal; I :- intrusion; A :- avoidance

Significance

*p<.01; **p<.001;  n.s. not significant.
PTSD symptoms

(i) PTSD Interview

These PTSD-I variables were analyzed by Mann-Whitney U tests due to the presence of non-normal distributions in either the hand injury or comparison group.

As predicted in hypothesis 1, individuals in the hand injury group exhibited significantly more PTSD symptoms than individuals in the comparison group. This was the case in terms of subjective ratings of distress on the PTSD-I (with a mean of 5.68 in the hand injury group versus 2.65 in the comparison group (z=-4.48; m1=25, m2=20; p<.001)); trauma reexperiencing (z=-3.58; m1=25, n2=20; p<.001); avoidance (z=-3.18; n1=25,n2=20; p<.001); increased arousal (z=-3.51; n1=25,n2=20; p<.001) and total PTSD-I severity scores (z=-3.70; m1=25, m2=20; p<.001).

As can be seen from Table 3, there was only a minimal reduction in these PTSD-I scores for the hand injury group at time 2 and mean subjective distress ratings increased slightly (from 5.68 to 5.87).

These group differences remained significant at time 2 and were even greater than at time 1 as shown by the larger z scores.

Multiple analysis of variance was computed to examine the presence of an interaction effect between groups and the three categories of trauma re-experiencing, avoidance and increased arousal on the PTSD-I. This demonstrated no within subject interaction effect of the three PTSD categories with groups either at time 1 (F (2,86) = 0.61, p>.05) and at time 2 (F (2, 76) =0.84, p>.05).

Diagnosis of PTSD and categories of PTSD symptoms.

At time 1, 11 individuals (44%) of the hand injury group met the criteria for DSM-III-R for trauma re-experiencing (as denoted by at least one "4" or higher response to items B1, B2, B3 and /or B4, Watson et al., 1991). Five individuals (20%) satisfied the criteria for avoidance (as defined by at least three "4" or higher responses to items C1, C2, C3, C4, C5, C6 and or C7) and 9 (36%) met the
criteria for increased arousal (as defined by at least two "4" or higher responses to items D1 through to D6).

At time 2, eight individuals (34%) with hand injuries met the criteria for DSM-III-R for trauma re-experiencing (one of whom had not met the criteria at time 1); five (22%) met the criteria for avoidance (again one of whom, the same individual who had not met the criteria at time 1) and six (26%) met the criteria for increased arousal (including another person who had not satisfied the criteria at time 1).

Two individuals with hand injuries (8%) met the DSM-III-R criteria for a current and lifetime PTSD diagnosis both at time 1 and time 2. Both were males and sustained their injuries between 2 1/2 to 3 years ago. One had undergone amputation and replantation of the hand, the other had suffered the amputation of two fingers after being crushed beneath falling rubble. Another individual met the criteria for a current PTSD diagnosis at time 1 but not at time 2.

Two people (10%) of the comparison group reached the DSM-III-R criteria for trauma re-experiencing (one at time 1, the other at time 2) and two for increased arousal (both at time 1). No person in the comparison group met the criteria for a current or lifetime PTSD diagnosis.

(ii) Intrusion and avoidance on the IES.

Intrusion scores (as assessed by the IES) were significantly higher in the hand injury group compared to the comparison group at time 2 (z=-2.93; m=23, n2=17); p<.01) whilst at time 1, this difference failed to reach significance (z=-2.53; m=25, n2=20; p>.01).

A slight decline in mean intrusion scores occurred from time 1 to time 2, with a mean decline of 2.30 for the hand injured group and of 3.20 for the comparison group. Similarly, a mean decline of 2.24 in avoidance scores occurred between time 1 and time 2 in the hand injury group and of 1.43 in the comparison group.
Avoidance scores on the IES were also significantly greater in the hand injury group (with a mean of 9.00) compared to the comparison group (with a mean of 3.55) at time 1 \((z=-2.91; n_1=25, n_2=20; p<.01)\) as well as at time 2 \((z=-2.82; n_1=23, n_2=17; p<.01)\).

On the intrusion scale, two individuals in the hand injury group \((8\%)\) scored above the cut-off point of over 19 both at time 1 and time 2. On the avoidance scale, three individuals with hand injuries \((12\%)\) scored beyond this cut-off point at time 1 compared to two individuals \((8\%)\) at time 2 (one of whom obtained an avoidance score of only 5 at time 1, 10 days after the occurrence of their injury).

Three individuals \((15\%)\) in the comparison group scored over 19 on the intrusion scale at time 1 although no one scored above this cut-off point at time 2. On the avoidance scale, no person in the comparison group scored beyond the cut-off point at either time 1 or time 2.

(iii) Anxiety and depression

As shown in Table 3, mean depression scores on the HAD were slightly higher in the hand injury group compared to the hand comparison group at both time intervals. However, more noticeable differences between the two groups are evident on the anxiety scale, with the hand injury group scoring significantly higher than the comparison group at time 1 \((t (43) = 2.95, p<.01)\) but not at time 2 \((t (38) = 1.57, p>.01)\).

On the HAD anxiety scale, one person in the hand injury group scored over the recommended cut-off point of over 10 for a probable disorder of relevant mood at time 1 and three people at time 2 \((13\%)\). One person also scored above this cut-off point on the depression scale at time 2 (obtaining a score of 15). This same individual met the criteria for a current PTSD diagnosis on the PTSD-I.

No individual in the comparison group scored beyond 10 on the HAD anxiety or depression scales either at time 1 or time 2. One person who scored 10 on the anxiety scale at time 2 related his anxiety to caring for an ill relative.
(iv) Positive and negative affect
Whilst there was very little difference between the two groups in mean positive affect scores on the PANAS at either time interval, the hand injury group achieved significantly higher negative affect balance scores on the PANAS at time 1 (with a mean of 20.36) compared to the comparison group (with a mean of 14.65) at time 1 (z = -2.92; n1 = 25, n2 = 20; p < .01). No significant difference emerged between the two groups at time 2 (z = -1.63; n1 = 23, n2 = 17; p > .01), when the negative affect score in the hand injury group decreased from time 1 by a mean of 2.4.

(v) Emotional distress
As shown in Table 3, in accordance with hypothesis 1, the hand injury group also reported higher ratings of emotional distress relating to their hand condition compared to the hand comparison group. Despite the high standard deviations in both groups, these group differences were significant at time 2 (z = -2.84; n1 = 23, n2 = 17; p < .01) but failed to reach significance at time 1 (z = -2.43; n1 = 25, n2 = 20; p < .01).

Whilst there was minimal decrease in these ratings between time 1 and time 2 within the hand injury group, mean ratings for the comparison group declined from 18.85 to 11.82 at time 2.

(vi) Self-confidence
The hand injury group reported that their self-confidence had been lowered significantly more than did the comparison group at time 2 (z = -2.09; n1 = 23, n2 = 17; p < .01) but not at time 1.

3.1.2 Social support
Table 4 show means (and standard deviations) of ratings of the amount of social support received and ratings of its helpfulness as a means of coping.
Significantly higher mean ratings of social support were obtained for the hand injury group compared to the comparison group at time 1 (z = -3.06; n1 = 25,
n2=20; p<.01). Social support was also rated significantly higher by the hand injury group at time 2 although not to a significant extent (z=-1.27; n1=25, n2=20; p>.01).

Social support was rated significantly more highly by the hand injury group with regard to its helpfulness at time 1 (z=-2.59; n1=25, n2=20; p<.01). Again, this difference failed to reach significance at time 2 (z=-0.23; n1=23, n2=17; p>.01) when the mean ratings for the comparison group rose slightly.

In the hand injury group, ratings of the amount of social support received and its helpfulness were only slightly less at time 2 than at time 1.

Table 4  Mean ratings (and standard deviations) of the amount of social support received and its helpfulness for hand injury and comparison (C) groups.

<table>
<thead>
<tr>
<th></th>
<th>Time 1</th>
<th>Time 2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Injury (n=25)</td>
<td>C (n=20)</td>
</tr>
<tr>
<td>Social support</td>
<td>M (SD) 9.64 (1.11)</td>
<td>M (SD) 6.05 (4.54)</td>
</tr>
<tr>
<td>Helpfulness</td>
<td>8.96 (1.80)</td>
<td>5.30 (4.69)</td>
</tr>
<tr>
<td></td>
<td>z -3.06*</td>
<td>z -2.59*</td>
</tr>
<tr>
<td></td>
<td>n1=25; n2=20; p&lt;.01</td>
<td>n1=23; n2=17; p&gt;.01</td>
</tr>
</tbody>
</table>

Significance

*p<.01; n.s. not significant.

3.1.3 Differences in problem- and emotion-focused coping

Means and standard deviations for the measures of problem- and emotion-focused coping (as assessed by the COPE) and mean ratings of coping ability on the VAS scale of 0-100 are presented in Table 5 across both time intervals. Compared to the comparison group, the hand injury group reported more use of problem-focused coping at time 2 and of emotion-focused coping at time 1.
although these differences failed to reach significance \( z = -2.49; n_1 = 23, n_2 = 17; p > .01 \) and \( z = -2.14; n_1 = 25, n_2 = 20; p > .01 \), respectively). At time 2, however, use of emotion coping was significantly more in the hand injury group \( z = -2.89; n_1 = 23, n_2 = 17; p < .01 \).

Between-group differences in the use of problem-focused coping at time 1 failed to reach significance. Standard deviations in the comparison group were also slightly higher at this time interval.

Use of problem-focused coping decreased somewhat from time 1 to time 2 in the hand injury group, whilst the comparison group showed a more marked decline in the use of problem-focused coping at time 2 (with a mean difference of 1.78).

**Table 5**  Means and standard deviations of problem- and emotion-focused coping strategies as measured by the COPE and perceived coping ability (according to the VAS).

<table>
<thead>
<tr>
<th>Time 1</th>
<th>Time 2</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Injury</strong> (n=25)</td>
<td><strong>C</strong> (n=20)</td>
</tr>
<tr>
<td>M (SD)</td>
<td>M (SD)</td>
</tr>
<tr>
<td>Problem focused</td>
<td>8.31 (1.96)</td>
</tr>
<tr>
<td>Emotion focused</td>
<td>7.91 (1.74)</td>
</tr>
<tr>
<td>Perceived coping</td>
<td>75.83 (19.90)</td>
</tr>
</tbody>
</table>

Significance *p < .01; n.s. not significant.
Both groups showed minimal decline in the use of emotion-focused coping from time 1 to time 2.

Wilcoxon's signed-ranks tests revealed more use of problem-focused coping compared to emotion-focused coping within the hand injury group at time 1 although this was not statistically significant ($z=-2.17; n=25; p>.01$). At time 2, their use of problem- and emotion-focused coping was almost equal ($z=-0.40; n=25; p>.01$).

The comparison group showed a greater mean difference in the use of problem-focused coping (which was more prevalent) compared to emotion-focused coping at time 1. This difference was not statistically significant ($z=-1.27; n=20; p>.01$) although, as previously mentioned, variance was higher at time 1. An interesting shift in the use of coping strategies occurred at time 2, when problem-focused coping was less prevalent than emotion-focused coping, but not to a significant level ($z=-1.50; n=17; p>.01$).

**Use of specific problem- and emotion-focused scales**

Closer inspection of the most predominantly used specific coping scales, revealed differences between the two groups. At time 1, 30% of individuals in the comparison group relied on active coping (a problem-focused strategy) or active coping combined with acceptance (an emotion-focused strategy) as their most frequently used scale. Active coping was not a predominant strategy used by any person in the hand injury group, for whom acceptance was the most frequently used scale. At time 2, acceptance alone was the most frequently used coping scale for a greater proportion (56%) of the hand injury group compared to 29% of the comparison group. In the comparison group, active coping, planning and suppression of competing activities (problem-focused strategies), as well as religion and positive re-interpretation and growth (emotion-focused strategies) also emerged as the most heavily used scales for at least one individual.
Perceived coping ability

According to the VAS rating, the hand injury group perceived themselves to be coping with their hand condition less well than the comparison group at time 1 (z=-2.74; n1=25, n2=20; p<.01). This difference between the two groups almost reached significance at time 2 (z=-2.23; n1=23, n2=17; p>.01).

Whilst the hand injury group overall also reported coping better with their hand injury at time 2 compared to time 1, (with a mean difference of 7.04), perceived coping in the comparison group showed minimal change.

3.14 Appraisal of importance, controllability, predictability and threat

Appraisal ratings (means and standard deviations) on "matters," control over the accident or onset (both at the time of the accident ("then") and present control over the hand condition), predictability ("predict"), degree of threat and Yes/No responses to whether the event was felt to be life-threatening both at the time of the accident and now are shown in Table 6.

Whilst mean ratings for the extent to which the hand injury group rated their condition as "mattering" to them exceeded that for the comparison group, this difference was not significant either at time 1 (z=-1.21; n1=25, n2=20; p>.01) or at time 2 (z=-0.79; n1=23, n2=17; p>.01).

Interestingly, ratings of perceived control over the accident (or onset of the hand condition) at the time of its occurrence or onset were also marginally higher in the hand injury group compared to the comparison group. However, this difference was not significant either at time 1 (z=-1.78; n1=25, n2=20; p>.01) or at time 2 (z=-1.17; n1=23, n2=17; p>.01).

There was no significant difference between the two groups in perceived control over their hand condition at the present time, nor in ratings of how predictable / unpredictable the accident or onset was either at time 1 or time 2.
Table 6  Appraisal ratings (means and standard deviations) on "matters," controllability, predictability, degree of threat and whether the event was life threatening.

<table>
<thead>
<tr>
<th></th>
<th>Time 1</th>
<th>Time 2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Injury (n=25)</td>
<td>Injury (n=23)</td>
</tr>
<tr>
<td></td>
<td>C (n=20)</td>
<td>C (n=17)</td>
</tr>
<tr>
<td></td>
<td>M (SD)</td>
<td>M (SD)</td>
</tr>
<tr>
<td></td>
<td>z</td>
<td>z</td>
</tr>
<tr>
<td>Matters</td>
<td>7.24 (2.63)</td>
<td>7.04 (2.57)</td>
</tr>
<tr>
<td></td>
<td>5.95 (3.69)</td>
<td>5.88 (3.40)</td>
</tr>
<tr>
<td></td>
<td>-1.21 n.s.</td>
<td>-0.79 n.s.</td>
</tr>
<tr>
<td>Control</td>
<td>&quot;then.&quot; 3.28 (4.26)</td>
<td>2.69 (3.86)</td>
</tr>
<tr>
<td></td>
<td>1.25 (2.83)</td>
<td>1.24 (3.03)</td>
</tr>
<tr>
<td></td>
<td>-1.78 n.s.</td>
<td>-1.17 n.s.</td>
</tr>
<tr>
<td>Present control</td>
<td>5.36 (3.21)</td>
<td>5.60 (2.59)</td>
</tr>
<tr>
<td></td>
<td>5.25 (4.20)</td>
<td>6.64 (4.01)</td>
</tr>
<tr>
<td></td>
<td>-1.73 n.s.</td>
<td>-1.30 n.s.</td>
</tr>
<tr>
<td>Threat</td>
<td>7.16 (3.68)</td>
<td>6.74 (3.58)</td>
</tr>
<tr>
<td></td>
<td>1.55 (3.00)</td>
<td>1.35 (2.81)</td>
</tr>
<tr>
<td></td>
<td>-4.16**</td>
<td>-3.96**</td>
</tr>
<tr>
<td>Predict</td>
<td>1.56 (2.82)</td>
<td>1.83 (2.81)</td>
</tr>
<tr>
<td></td>
<td>0.95 (2.16)</td>
<td>2.82 (4.30)</td>
</tr>
<tr>
<td></td>
<td>-0.90 n.s.</td>
<td>-2.80 n.s.</td>
</tr>
<tr>
<td>Life threat</td>
<td>13 (52%) 12 (48%)</td>
<td>9 (39%) 14 (61%)</td>
</tr>
<tr>
<td></td>
<td>0 20 (100%)</td>
<td>0 17 (100%)</td>
</tr>
<tr>
<td>then</td>
<td>Life threat</td>
<td>Life threat</td>
</tr>
<tr>
<td></td>
<td>8 (32%) 17 (68%)</td>
<td>7 (30%) 16 (70%)</td>
</tr>
<tr>
<td></td>
<td>0 20 (100%)</td>
<td>0 17 (100%)</td>
</tr>
</tbody>
</table>

Significance

**p<.001;  n.s. not significant.
Ratings of how threatening the hand injury (or hand condition) was at the time of its occurrence (or onset) were, however, significantly higher in the hand injury group at both time 1 (z=-4.16; n1=25, n2=20; p<.001) and at time 2 (z=-3.96; n1=23, n2=17; p<.001). These ratings of threat decreased only slightly in the hand injury group at time 2.

Whilst 52% of individuals in the hand injury group reported feeling that their injury was life-threatening at the time of its occurrence, this figure reduced to 39% when individuals responded to the same question at time 2.

Only 32% of individuals still perceived this event to be life-threatening at the time of the initial interview. This figure barely decreased to 30% when individuals were asked the same question at time 2.

Closer inspection of the results highlighted three individuals who reported their injury as life-threatening at time 2 but who had responded negatively to this question at time 1.

No one in the comparison group at either time interval rated their condition as life-threatening.

**Interaction effects**

Multivariate analysis of variance of the appraisal factors of "matters," control at the time of the hand accident (or onset of the hand condition), present control, predictability and threat, showed a significant within-subject groups by appraisal effect at time 1 (F (4, 172) = 4.81, p=.001) and at time 2 (F (4, 152) = 6.45, p<.001).

A plot of group means for these factors showed a greater mean difference between the two groups for threat (at both time 1 and time 2) than for the other variables of appraisal. In addition, an interaction between time 1 and time 2 occurred for present control and predictability. At time 2 these scores increased from time 1 in the comparison group to a greater extent than in the hand injury group.
3.1.5 **Appraisal of hand injury (or hand condition) as a threat, loss or challenge**

Chi-square analysis was performed between the hand injured and comparison groups according to appraisal of their hand condition as a threat, loss or challenge. No significant difference was observed at time 1 ($X^2 (2) = 1.61, p>.05$), using the standard Pearson Chi-square value).

At time 2, however, significant differences in appraisal emerged ($X^2 (2) = 12.33, p<.01$).

Table 7 shows a contingency table of the results of these threat, loss or challenge appraisals at time 1 and time 2.

### Table 7 Contingency tables of threat, loss or challenge appraisals at time 1 and time 2 for hand injury and comparison (C) groups.

<table>
<thead>
<tr>
<th>Time 1.</th>
<th>Group</th>
<th>Threat</th>
<th>Loss</th>
<th>Challenge</th>
<th>Row total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Injury</td>
<td>8</td>
<td>11</td>
<td>6</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(25%)</td>
<td>(34%)</td>
<td>(22%)</td>
<td>(56.8%)</td>
</tr>
<tr>
<td></td>
<td>C</td>
<td>7</td>
<td>5</td>
<td>7</td>
<td>19</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(13%)</td>
<td>(26%)</td>
<td>(23%)</td>
<td>(43.2%)</td>
</tr>
<tr>
<td></td>
<td>Row total</td>
<td>15 (34%)</td>
<td>16 (36%)</td>
<td>13 (30%)</td>
<td>44</td>
</tr>
<tr>
<td>Time 2.</td>
<td>Group</td>
<td>Threat</td>
<td>Loss</td>
<td>Challenge</td>
<td>Row total</td>
</tr>
<tr>
<td>---------</td>
<td>-------</td>
<td>--------</td>
<td>------</td>
<td>-----------</td>
<td>-----------</td>
</tr>
<tr>
<td></td>
<td>Injury</td>
<td>6</td>
<td>12</td>
<td>5</td>
<td>23</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(20%)</td>
<td>(43%)</td>
<td>(22%)</td>
<td>(59.0%)</td>
</tr>
<tr>
<td></td>
<td>C</td>
<td>3</td>
<td>1</td>
<td>12</td>
<td>16</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(12%)</td>
<td>(6%)</td>
<td>(31%)</td>
<td>(41.0%)</td>
</tr>
<tr>
<td></td>
<td>Row total</td>
<td>9 (23%)</td>
<td>13 (33%)</td>
<td>17 (44%)</td>
<td>39</td>
</tr>
<tr>
<td>Column</td>
<td>25</td>
<td>19</td>
<td>44</td>
<td>39</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>56.8</td>
<td>43.2</td>
<td>100.0</td>
<td>100.0</td>
<td></td>
</tr>
</tbody>
</table>

Loss appraisals were more prevalent in the hand injured group (comprising a total of 52% of individuals in this group compared to 32% at time 1), whilst challenge appraisals were the predominant form of appraisal in the comparison group (comprising a total of 75% compared to 35% at time 1). The proportion of individuals in the hand comparison group who attributed their condition as a loss decreased from 30% at time 1 to 6% at time 2. Threat appraisals in the comparison group also reduced by almost half (from 35% to 18%).

69
3.1.6 Correlations between coping strategies and psychological distress

(i) PTSD symptoms

Correlations (according to Kendall’s tau-b coefficient) between problem-focused and emotion-focused coping and the PTSD-I symptoms are presented in Table 8 for the hand injury and comparison groups separately.

Hand injury group

Contrary to hypothesis 2, in the hand injury group both problem- and emotion-focused coping strategies were positively correlated with the PTSD-I categories of trauma re-experiencing (TR), avoidance (A), increased arousal (IA) and total PTSD-I scores at time 1 and time 2.

At time 1, the significance levels of these associations were similar for both problem- and emotion-focused coping. However, the size of the correlation between trauma re-experiencing and emotion-focused coping ($r=.69$, $p<.001$), accounts for 47.6% of common variance compared to that with problem-focused coping ($r=.51$, $p<.001$), which reflects only 26% of common variance. Likewise, the correlation between increased arousal and emotion-focused coping ($r=.45$, $p<.01$) accounts for 20.3% of common variance, more than twice that between increased arousal and problem-focused coping ($r=.35$, $p<.01$, which only explains 12.3% of common variance).

In contrast, at time 2, increased arousal showed a stronger correlation with problem-focused coping ($r=.43$, $p<.01$) than with emotion-focused coping ($r=.32$, $p>.01$), whilst trauma re-experiencing was again more strongly associated with emotion-focused coping ($r=.54$, $p<.01$) than with problem-focused coping ($r=.28$, $p>.01$).

Avoidance was also more strongly correlated with emotion-focused coping ($r=.55$, $p<.001$) than it was with problem-focused coping ($r=.40$, $p<.01$).

Subjective ratings of distress were more positively associated with problem-focused coping than with emotion-focused coping at time 2.

However, despite these statistically significant correlations, their size is relatively small and even the largest correlation of $r=.69$ accounts for only 47.6% of the variance in common.
Table 8  Correlations between problem- and emotion-focused coping strategies and PTSD symptoms for hand injury and comparison groups

<table>
<thead>
<tr>
<th>Hand injury group</th>
<th>Time 1</th>
<th></th>
<th>Time 2</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Problem-focused</td>
<td>Emotion-focused</td>
<td>Problem-focused</td>
<td>Emotion-focused</td>
</tr>
<tr>
<td>PTSD-I</td>
<td>$r$ (n=25)</td>
<td>$r$ (n=25)</td>
<td>$r$ (n=23)</td>
<td>$r$ (n=23)</td>
</tr>
<tr>
<td>Distress</td>
<td>.18 n.s.</td>
<td>.24 n.s.</td>
<td>.38 n.s.</td>
<td>.13 n.s.</td>
</tr>
<tr>
<td>TR.</td>
<td>.51**</td>
<td>.69**</td>
<td>.28 n.s.</td>
<td>.54*</td>
</tr>
<tr>
<td>A.</td>
<td>.50**</td>
<td>.60**</td>
<td>.40*</td>
<td>.55**</td>
</tr>
<tr>
<td>IA.</td>
<td>.35*</td>
<td>.45*</td>
<td>.43*</td>
<td>.32 n.s.</td>
</tr>
<tr>
<td>Total PTSD</td>
<td>.55**</td>
<td>.60**</td>
<td>.45**</td>
<td>.51**</td>
</tr>
<tr>
<td>IES scores</td>
<td>.48**</td>
<td>.46**</td>
<td>.33 n.s.</td>
<td>.20 n.s.</td>
</tr>
<tr>
<td>A.</td>
<td>.45**</td>
<td>.50**</td>
<td>.29 n.s.</td>
<td>.23 n.s.</td>
</tr>
<tr>
<td>Comparison group</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PTSD-I</td>
<td>$r$ (n=20)</td>
<td>$r$ (n=20)</td>
<td>$r$ (n=17)</td>
<td>$r$ (n=17)</td>
</tr>
<tr>
<td>Distress</td>
<td>.19 n.s.</td>
<td>.28 n.s.</td>
<td>.11 n.s.</td>
<td>.16 n.s.</td>
</tr>
<tr>
<td>TR.</td>
<td>.29 n.s.</td>
<td>.16 n.s.</td>
<td>.19 n.s.</td>
<td>.10 n.s.</td>
</tr>
<tr>
<td>A.</td>
<td>.38 n.s.</td>
<td>.22 n.s.</td>
<td>.21 n.s.</td>
<td>.17 n.s.</td>
</tr>
<tr>
<td>IA.</td>
<td>.26 n.s.</td>
<td>.17 n.s.</td>
<td>.01 n.s.</td>
<td>.39 n.s.</td>
</tr>
<tr>
<td>Total PTSD</td>
<td>.41*</td>
<td>.29 n.s.</td>
<td>.05 n.s.</td>
<td>-.23 n.s.</td>
</tr>
<tr>
<td>IES scores</td>
<td>.25 n.s.</td>
<td>.37 n.s.</td>
<td>.32 n.s.</td>
<td>.03 n.s.</td>
</tr>
<tr>
<td>A.</td>
<td>.32 n.s.</td>
<td>.25 n.s.</td>
<td>.18 n.s.</td>
<td>-.03 n.s.</td>
</tr>
</tbody>
</table>

Significance

* $p<.01$;  ** $p<.001$;  n.s. not significant.  
$r$ = Kendall's tau-b coefficient.
(ii) IES scores
There was little difference between problem- and emotion-focused coping in their correlations with either intrusion (I) or avoidance (A) scores on the IES at time 1 (each of these correlations had a significance level below .001). At time 2, neither coping strategy was significantly associated with intrusion or with avoidance scores.
Whilst the findings from the PTSD-I scores therefore tend to support the hypothesis of stronger relationships between emotion-focused coping and PTSD symptoms than those between problem-focused coping and PTSD symptoms, the results from the IES scores fail to support this hypothesis.

Comparison group
(i) PTSD-I symptoms
In contrast to the hand injury group, the only significant associations in the comparison group at time 1 were between problem-focused coping and total PTSD-I scores (r=.41, p<.01). Although emotion-focused coping showed a positive association with increased arousal at time 2, this was not significant (r=.39, p>.01) and accounts for only 15% of common variance.

(ii) IES scores
No significant correlations emerged between problem- or emotion-focused coping and intrusion or avoidance on the IES.

(iii) HAD anxiety and depression scores
Hand injury group
Correlations between problem- and emotion-focused strategies, HAD anxiety and depression scores and positive and negative affect scores are shown in Table 9 for both participant groups.
In the hand injury group, both problem- and emotion-focused coping strategies showed significant positive associations with anxiety and depression scores at time 1 and at time 2. The size of these correlations was only slightly greater for
emotion-focused coping (ranging from 17.6% to 18.5%) compared to problem-focused coping (ranging from 13% to 16%).

Table 9 Correlations between coping strategies, HAD anxiety and depression scores and PANAS (positive and negative affect) scores

<table>
<thead>
<tr>
<th>Hand injury group</th>
<th>Time 1</th>
<th></th>
<th>Time 2</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Problem-focused</td>
<td>Emotion-focused</td>
<td>Problem-focused</td>
<td>Emotion-focused</td>
</tr>
<tr>
<td>HAD anxiety</td>
<td>.40*</td>
<td>.43*</td>
<td>.39*</td>
<td>.42*</td>
</tr>
<tr>
<td>HAD depression</td>
<td>.36*</td>
<td>.42*</td>
<td>.31*</td>
<td>.52**</td>
</tr>
<tr>
<td>Positive affect</td>
<td>-.06 n.s.</td>
<td>-.04 n.s.</td>
<td>-.05 n.s.</td>
<td>-.14 n.s.</td>
</tr>
<tr>
<td>Negative affect</td>
<td>.35*</td>
<td>.39*</td>
<td>.14 n.s.</td>
<td>.35*</td>
</tr>
<tr>
<td>Comparison group</td>
<td>r (n=20)</td>
<td>r (n=20)</td>
<td>r (n=17)</td>
<td>r (n=17)</td>
</tr>
<tr>
<td>HAD anxiety</td>
<td>.53**</td>
<td>.48*</td>
<td>-.10 n.s.</td>
<td>-.13 n.s.</td>
</tr>
<tr>
<td>HAD depression</td>
<td>.60**</td>
<td>.41*</td>
<td>.07 n.s.</td>
<td>.00 n.s.</td>
</tr>
<tr>
<td>Positive affect</td>
<td>.19 n.s.</td>
<td>-.03 n.s.</td>
<td>.02 n.s.</td>
<td>.33 n.s.</td>
</tr>
<tr>
<td>Negative affect</td>
<td>.21 n.s.</td>
<td>.48*</td>
<td>-.04 n.s.</td>
<td>-.24 n.s.</td>
</tr>
</tbody>
</table>

Significance

*p<.01;  **p<.001;  n.s. not significant.

r = Kendall’s tau-b coefficient.

However, depression was more strongly correlated with emotion-focused coping at time 2, accounting for 27% of common variance (r=.52, p<.001) than
with problem-focused coping ($r = .31, p < .01$), accounting for only $9.6\%$ of common variance.

(iv) PANAS scores

Whilst negative affect showed significant correlations with both problem- and emotion-focused coping at time 1, only emotion-focused coping was significantly correlated with negative affect at time 2 ($r = .35, p < .01$). Although the size of this relationship still only reflects $12.3\%$ of common variance, this is greater than the correlation between problem-focused coping and negative affect ($r = .14, p > .01$) which accounts for less than $2\%$ of common variance. These findings therefore provide some support for the stronger relationship between emotion-focused coping and HAD depression scores and negative affect compared to these same correlations with problem-focused coping.

Comparison group

(iii) HAD anxiety and depression scores

For the comparison group, significant correlations between problem- and emotion-focused coping were only found at time 1. As can be seen from Table 9, anxiety was more strongly correlated with both problem-focused coping ($r = .53, p < .001$) compared to emotion-focused coping ($r = .48, p < .01$). Likewise, depression was also more strongly correlated with problem-focused coping ($r = .60, p < .001$) compared to emotion-focused coping ($r = .41, p < .01$).

(iv) PANAS scores

Findings in the comparison group also contrasted with the hand injury group with respect to correlations between coping and positive and negative affect scores. Emotion-focused coping was positively correlated with negative affect at time 1 ($r = .48, p < .01$). At time 2, emotion-focused coping and positive affect showed a positive association although this was not significant ($r = .33, p > .01$).
Correlations between emotion- versus problem-focused coping at time 1 and scores on measures of psychological distress at time 2

Correlations between emotion- versus problem-focused coping scores at time 1 and scores on total PTSD-I, intrusion and avoidance on the IES, anxiety and depression on the HAD and PANAS (positive and negative affect scores) at time 2 are displayed in Table 10 (a) for the hand injury group.

Hand injury group

As predicted in hypothesis 3, the correlation between emotion-focused coping and total PTSD-I scores (r=.49, p < .001) was stronger than that between problem-focused coping and total PTSD-I scores (r=.40, p > .01). However, converting these values to Fisher's z statistic showed no significant difference between the two correlations (z = .11, p > .01).

Compared to problem-focused coping, emotion-focused coping was also more positively correlated with intrusion and depression although these correlations were not significant (r = .31, p > .01 and r = .36, p > .01, respectively).

Contrary to expectation, both types of coping strategy at time 1 were equally correlated with anxiety scores at time 2.

Correlations between measures of psychological distress at time 1 and emotion- and problem-focused coping at time 2 are presented in Table 10 (b).

Cross-lagged panel analysis to investigate direction of causality of correlations with emotion-focused coping

Direction of effect was examined using cross-lagged panel correlations (Parry and Watts, 1989). It was predicted that correlations between emotion-focused coping at time 1 and measures of psychological distress at time 2 would also be larger than correlations between these measures at time 1 and emotion-focused coping at time 2.
Table 10 (a) Correlations between emotion-focused coping scores at time 1 and scores on measures of psychological distress at time 2, versus correlations between problem-focused coping at time 1 and these same measures at time 2

<table>
<thead>
<tr>
<th>Hand injury group</th>
<th>Emotion-focused coping (time 1)</th>
<th>Problem-focused coping (time 1)</th>
<th>Difference (Fisher’s z)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>( r )</td>
<td>( r )</td>
<td>( z )</td>
</tr>
<tr>
<td>Total PTSD-I</td>
<td>( .49^{**} )</td>
<td>( .40^{*} )</td>
<td>( .11 ) n.s.</td>
</tr>
<tr>
<td>IES intrusion</td>
<td>( .31 ) n.s.</td>
<td>( .18 ) n.s.</td>
<td>( .44 ) n.s.</td>
</tr>
<tr>
<td>IES avoidance</td>
<td>( .17 ) n.s.</td>
<td>( .27 ) n.s.</td>
<td>( .29 ) n.s.</td>
</tr>
<tr>
<td>HAD anxiety</td>
<td>( .44^{*} )</td>
<td>( .46^{*} )</td>
<td>( .08 ) n.s.</td>
</tr>
<tr>
<td>HAD depression</td>
<td>( .36 ) n.s.</td>
<td>( .19 ) n.s.</td>
<td>( .59 ) n.s.</td>
</tr>
<tr>
<td>Positive affect</td>
<td>( -.02 ) n.s.</td>
<td>( .02 ) n.s.</td>
<td>( 0.0 ) n.s.</td>
</tr>
<tr>
<td>Negative affect</td>
<td>( .16 ) n.s.</td>
<td>( .15 ) n.s.</td>
<td>( 0.03 ) n.s.</td>
</tr>
</tbody>
</table>

Table 10 (b) Correlations between measures of psychological distress at time 1 and emotion- and problem-focused coping at time 2

<table>
<thead>
<tr>
<th>Hand injury group</th>
<th>Emotion-focused coping (time 2)</th>
<th>Problem-focused coping (time 2)</th>
<th>Difference (Fisher’s z)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>( r )</td>
<td>( r )</td>
<td>( z )</td>
</tr>
<tr>
<td>Total PTSD-I</td>
<td>( .42^{*} )</td>
<td>( .39 ) n.s.</td>
<td>( .11 ) n.s.</td>
</tr>
<tr>
<td>IES intrusion</td>
<td>( .09 ) n.s.</td>
<td>( .32 ) n.s.</td>
<td>( .77 ) n.s.</td>
</tr>
<tr>
<td>IES avoidance</td>
<td>( .18 ) n.s.</td>
<td>( .09 ) n.s.</td>
<td>( .28 ) n.s.</td>
</tr>
<tr>
<td>HAD anxiety</td>
<td>( .38 ) n.s.</td>
<td>( .27 ) n.s.</td>
<td>( .39 ) n.s.</td>
</tr>
<tr>
<td>HAD depression</td>
<td>( .35 ) n.s.</td>
<td>( .09 ) n.s.</td>
<td>( .87 ) n.s.</td>
</tr>
<tr>
<td>Positive affect</td>
<td>( -.19 ) n.s.</td>
<td>( -.06 ) n.s.</td>
<td>( .41 ) n.s.</td>
</tr>
<tr>
<td>Negative affect</td>
<td>( .24 ) n.s.</td>
<td>( .06 ) n.s.</td>
<td>( .58 ) n.s.</td>
</tr>
</tbody>
</table>

Significance \( ^{*}p<.01; \) \( **p<.001; \) n.s. not significant.

\( r = \) Kendall’s tau-b coefficient.
Larger correlations are evident between emotion-focused coping at time 1 and total PTSD-I scores at time 2 ($r = .49$, $p < .001$) versus total PTSD-I scores at time 1 and emotion-focused coping at time 2 ($r = .42$, $p < .01$); and between emotion-focused coping at time 1 and anxiety at time 2 ($r = .44$, $p < .01$) versus emotion-focused coping at time 2 and anxiety at time 1 ($r = .38$, $p > .01$).

Emotion-focused coping at time 1 was more strongly associated with intrusion scores at time 2 ($r = .31$, $p > .01$), than between intrusion at time 1 and emotion-focused coping at time 2 ($r = .09$, $p > .01$).

However, none of these differences between correlations were significantly different according to Fisher's $z$ statistic. The trend of these results are therefore in the hypothesized direction but fail to provide conclusive proof of the negative causal influence of emotion-focused coping on psychological distress.

**Direction of causality of correlations with problem-focused coping**

Regarding problem-focused coping, one noticeable result was that problem-focused coping at time 1 was positively correlated with anxiety scores at time 2 ($r = .46$, $p < .01$), whilst the correlation between anxiety at time 1 and problem-focused coping at time 2 was not significant ($r = .27$, $p > .01$). This suggests that contrary to the hypothesis, problem-focused coping may play a role in the onset of anxiety symptoms in addition to emotion-focused coping.

The positive correlation between problem-focused coping at time 1 and total PTSD-I scores at time 2 ($r = .40$, $p < .01$) was almost equal to that between total PTSD-I scores at time 1 and problem-focused coping at time 2 ($r = .39$, $p > .01$), suggesting a bi-directional relationship or feedback effect between coping and post-traumatic symptomatology.

**Comparison group**

No significant correlations between either emotion-focused coping nor problem-focused coping at time 1 and measures of psychological distress at time 2 were detected in the comparison group.
The largest correlations were noted between total PTSD-I scores at time 1 and emotion-focused coping at time 2 (r=.41, p>.01) and between depression scores at time 1 and problem-focused coping at time 2 (r=.39, p>.01). These correlations are presented in Appendix 15, Table 1. These results thus fail to support the causal influence of either coping strategy on symptomatology in this non-traumatized group, but suggest that the experience of psychological symptoms may influence coping.

3.1.8 Correlations between threat appraisal and measures of psychological distress

Correlations between threat appraisal, PTSD-I scores, IES scores, emotional distress, positive and negative affect and problem- and emotion-focused coping strategies are presented in Table 11 for both participant groups.

Hand injury group

(i) PTSD-I and IES scores

As hypothesized, ratings of perceived threat of the hand injury were positively correlated with ratings of distress on the PTSD-I both at time 1 (r=.49, p<.01) but not at time 2 (r=.39, p>.01).

The intensity of perceived threat was also positively correlated with trauma re-experiencing (TR) at time 2 (r=.55, p<.001). As shown in Table 11, there are many other positive correlations between perceived threat and PTSD-I and IES scores at around the value of .24 to .30. However, these reflect only a small proportion (less than 10%) of common variance.

(ii) HAD anxiety and depression and VAS ratings of emotional distress

Correlations between HAD anxiety or depression and threat were not significant at either time 1 or time 2, although VAS ratings of emotional distress experienced were positively correlated with threat at time 2 (r=.53, p<.001).
Table 11 Correlations between threat appraisal and scores on the PTSD-I, IES, VAS emotional distress, PANAS (positive and negative affect) and problem- and emotion-focused coping

<table>
<thead>
<tr>
<th></th>
<th>Hand injury group</th>
<th></th>
<th>Comparison group</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Time 1</td>
<td>Time 2</td>
<td>Time 1</td>
<td>Time 2</td>
</tr>
<tr>
<td>PTSD-I</td>
<td>r (n=25)</td>
<td>r (n=23)</td>
<td>r (n=20)</td>
<td>r (n=17)</td>
</tr>
<tr>
<td>Distress</td>
<td>.49*</td>
<td>.39 n.s.</td>
<td>.13 n.s.</td>
<td>.20 n.s.</td>
</tr>
<tr>
<td>TR.</td>
<td>.24 n.s.</td>
<td>.55**</td>
<td>.13 n.s.</td>
<td>-.10 n.s.</td>
</tr>
<tr>
<td>A.</td>
<td>.23 n.s.</td>
<td>.35 n.s.</td>
<td>.17 n.s.</td>
<td>.12 n.s.</td>
</tr>
<tr>
<td>IA.</td>
<td>.19 n.s.</td>
<td>.01 n.s.</td>
<td>.26 n.s.</td>
<td>.32 n.s.</td>
</tr>
<tr>
<td>Total PTSD</td>
<td>.28 n.s.</td>
<td>.27 n.s.</td>
<td>.17 n.s.</td>
<td>.21 n.s.</td>
</tr>
<tr>
<td>IES</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I.</td>
<td>.17 n.s.</td>
<td>.30 n.s.</td>
<td>-.15 n.s.</td>
<td>.42 n.s.</td>
</tr>
<tr>
<td>A.</td>
<td>.20 n.s.</td>
<td>.30 n.s.</td>
<td>.14 n.s.</td>
<td>.12 n.s.</td>
</tr>
<tr>
<td>HAD anxiety</td>
<td>.11 n.s.</td>
<td>.23 n.s.</td>
<td>.12 n.s.</td>
<td>.06 n.s.</td>
</tr>
<tr>
<td>HAD depression</td>
<td>.17 n.s.</td>
<td>.28 n.s.</td>
<td>.07 n.s.</td>
<td>.00 n.s.</td>
</tr>
<tr>
<td>Emotional distress</td>
<td>.32 n.s.</td>
<td>.53**</td>
<td>-.11 n.s.</td>
<td>.28 n.s.</td>
</tr>
<tr>
<td>Positive affect</td>
<td>.14 n.s.</td>
<td>.53**</td>
<td>.35 n.s.</td>
<td>-.23 n.s.</td>
</tr>
<tr>
<td>Negative affect</td>
<td>.17 n.s.</td>
<td>.10 n.s.</td>
<td>-.08 n.s.</td>
<td>.17 n.s.</td>
</tr>
<tr>
<td>Coping</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Problem-focused</td>
<td>.22 n.s.</td>
<td>.02 n.s.</td>
<td>.33 n.s.</td>
<td>-.30 n.s.</td>
</tr>
<tr>
<td>Emotion-focused</td>
<td>.19 n.s.</td>
<td>.28 n.s.</td>
<td>.06 n.s.</td>
<td>-.27 n.s.</td>
</tr>
<tr>
<td>Significance</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>*p&lt;.01; **p&lt;.001; n.s. not significant</td>
<td>r = Kendall's tau-b coefficient.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(iii) Positive and negative affect
Interestingly, positive affect showed a positive correlation with threat at time 2 (r=.53, p<.001) but not at time 1, whilst correlations with negative affect and threat were not significant either at time 1 or time 2.
(iv) Problem- and emotion-focused coping

Threat intensity was more positively correlated with use of emotion-focused coping at time 2 compared to problem-focused coping although this association was not significant ($r=0.28$, $p>0.01$) and accounts for only 7.8% of common variance.

Comparison group

(i) PTSD-I and IES scores

In contrast to the hand injury group, in the comparison group there were no significant correlations between threat and individual PTSD symptoms on the PTSD-I nor with the total PTSD-I score. Intrusion scores on the IES and perceived threat of the hand condition were positively correlated at time 2 (although not to a significant extent: $r=0.42$, $p>0.01$) reflecting 17.6% of common variance, but not at time 1 ($r=-0.15$, $p>0.01$). Avoidance on the IES and threat were not correlated at either time 1 or time 2.

(ii) HAD anxiety and depression and VAS ratings of emotional distress

As can be seen from Table 11, neither HAD anxiety and depression scores nor ratings of emotional distress were significantly correlated with threat at either time of assessment.

(iii) Positive and negative affect

Whilst positive affect and threat were negatively correlated (in the expected direction) at time 1, this was not significant ($r=0.23$, $p>0.01$). Moreover, positive affect showed a non-significant but positive relationship with threat at time 1 ($r=0.35$, $p>0.01$). Negative affect and threat were not significantly correlated, thus failing to support the original hypothesis in this client group.

(iv) Problem- and emotion-focused coping

No clear associations were found between either problem- or emotion-focused coping and threat.
3.1.9 VAS ratings of coping efficacy and objective coping measures

In the hand injury group, VAS ratings of coping efficacy were not significantly correlated with problem-focused coping at time 1 \((r=.12, p>.01)\) nor at time 2 \((r=-.03, p>.01)\). Negative correlations between VAS coping ratings and emotion-focused coping were not significant at time 1 \((r=-.17, p>.01)\) nor at time 2 \((r=-.20, p>.01)\).

In the comparison group, VAS ratings of coping efficacy were neither correlated with problem-focused coping at time 1 \((r=-.19, p>.01)\) nor at time 2 \((r=-.16, p>.01)\). However, use of emotion-focused coping showed a tendency towards a negative correlation with VAS ratings of coping efficacy at time 1 \((r=-.35, p>.01)\). These results fail to confirm the hypothesis of a relationship between subjective ratings of coping efficacy and problem-focused coping (hypothesis 5).

3.2 Analysis of most and least helpful ways of coping

The frequency of items reported by individuals as either the first, second or third most and least helpful ways of coping are summarized in Table 12 (showing methods endorsed by at least two people) and a complete outline of these items is shown in Table 2 (Appendix 16).

Helpful coping strategies

In the hand injury group, support from (or talking to) family or friends was the most frequently reported helpful coping strategy.

Trying to think positively or look on the positive side was the most frequently endorsed helpful strategy for the hand comparison group in addition to physiotherapy advice or exercises.

Holding a determined approach (including statements such as "I've got to go for it," or "things won't beat me") was also reported as helpful by five individuals in the comparison group at time 2.

Thinking "there's no point in worrying" was reported to be helpful by at least two individuals in both the hand injury and comparison groups at time 1.
Least helpful strategies

Fewer individuals in either group reported on the least helpful coping strategies. Meeting new people and being asked repetitive questions was the most frequently described least helpful strategy for the hand injury group at time 1. At time 2, the most frequently reported least helpful strategy changed to "people being sarcastic or making jokes about my hand."

Only one person in the hand comparison group commented on either of these issues.

Table 12 Most and least helpful ways of coping reported by hand injury (HI) and hand comparison (HC) groups

<table>
<thead>
<tr>
<th>1. Most helpful ways of coping</th>
<th>Time 1</th>
<th>Time 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Support from or talking to family/friends</td>
<td>HI 10</td>
<td>HC 2</td>
</tr>
<tr>
<td>Trying to think positively/looking on the positive side</td>
<td>HI 4</td>
<td>HC 3</td>
</tr>
<tr>
<td>Thinking &quot;there's no point in worrying&quot;</td>
<td>HI 3</td>
<td>HC 2</td>
</tr>
<tr>
<td>Holding a determined approach (e.g. &quot;I've got to go for it,&quot; &quot;Things won't beat me&quot;)</td>
<td>HI 0</td>
<td>HC 3</td>
</tr>
<tr>
<td>Physiotherapy advice and exercises</td>
<td>HI 3</td>
<td>HC 4</td>
</tr>
<tr>
<td>Keeping busy, returning to work and resuming a normal life</td>
<td>HI 2</td>
<td>HC 1</td>
</tr>
<tr>
<td>Taking up a new activity</td>
<td>HI 0</td>
<td>HC 1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2. Least helpful ways of coping</th>
<th>Time 1</th>
<th>Time 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meeting new people and being asked repetitive questions</td>
<td>HI 4</td>
<td>HC 0</td>
</tr>
<tr>
<td>People being sarcastic or making jokes about my hand</td>
<td>HI 0</td>
<td>HC 1</td>
</tr>
</tbody>
</table>
3.3 Summary of results

1. Individuals with hand injuries reported significantly higher levels of distress and PTSD symptoms (including trauma re-experiencing, avoidance and increased arousal on the PTSD-I) and obtained significantly higher scores on the intrusion subscale of the Impact of Event Scale (at time 1) and on the avoidance subscale (at both time 1 and time 2); the HAD anxiety scale (at time 1); VAS ratings of emotional distress (at time 2) and negative affect on the PANAS (at time 1) compared to the comparison group.

No between-group differences were found between perceived control over the hand injury (or hand condition) nor in ratings of predictability.

2. Prevalence rates of 8% for a current (and lifetime) diagnosis of PTSD were found in the hand injury group at both time 1 and time 2.

3. Significant differences in threat, loss or challenge appraisals were found at time 2. Loss appraisals were more prevalent in the hand injury group, whilst challenge appraisals were the predominant form of appraisal in the comparison group.

4. The hand injury group reported significantly more use of emotion-focused coping at time 2. Their use of problem- and emotion-focused coping was also greater than for the comparison group at time 1, although not to a significant extent.

5. Correlations were found between both problem- and emotion-focused coping and symptoms of PTSD. However, increased arousal was more strongly correlated with problem-focused coping than with emotion-focused coping only at time 2, whilst trauma re-experiencing and avoidance were most strongly correlated with emotion-focused coping at both time 1 and time 2.

The relationship between depression and emotion-focused coping was also greater than with problem-focused coping at time 2.

6. As hypothesized, correlations between emotion-focused coping at time 1 and measures of psychological distress at time 2 were stronger than those between problem-focused coping at time 1 and psychological distress at time 2 in terms of total PTSD-I scores, intrusion on the Impact of Event Scale and HAD
depression scores. However, these differences between correlations were not statistically significant.

7. Larger correlations were observed between emotion-focused coping at time 1 and both total PTSD-I scores and anxiety at time 2, compared to correlations between total PTSD-I scores at time 1 or anxiety and emotion-focused coping at time 2. Again, these differences between correlations failed to reach significance.

8. Surprisingly, a positive association was found between problem-focused coping at time 1 and anxiety at time 2, plus a bi-directional relationship between problem-focused coping and total PTSD-I scores.

9. Ratings of perceived threat of the hand injury (or onset of the hand condition) were significantly greater in the hand injury group than in the comparison group. Perceived threat was also positively correlated with trauma re-experiencing at time 2, ratings of distress on the PTSD-I at time 1, VAS ratings of emotional distress at time 2 and positive affect at time 2 (but not with anxiety scores).

10. Social support from family or friends was the most frequently endorsed helpful coping strategy in the hand injury group at time 1. At time 2 this was preceded by thinking positively. Trying to think positively and holding a determined approach were the most frequently reported helpful strategies in the comparison group.
Chapter Four: Discussion

In support of previous studies of the psychological impact of hand injuries (Cohney, 1978; Grunert et al., 1988c), the results from the present study highlighted significant psychological distress in hand injury victims.

The present results extend the validity of the findings of Grunert et al. (1992a) and Grunert et al. (1988c) by comparison with a group of individuals with non-traumatically induced hand deformities. Objectivity was also increased by the use of standardized assessment techniques.

4.1 Differences in psychological functioning between individuals with hand injuries and the comparison group

As hypothesized, the results highlighted significantly more PTSD symptoms in terms of trauma re-experiencing, avoidance and increased arousal (on the PTSD-I: Watson et al., 1991) as well as intrusion and avoidance on the Impact of Event Scale (Horowitz et al., 1979).

4.1.1 Diagnosis of PTSD

Almost half (44%) of the hand injury group met the DSM-III-R criteria for trauma re-experiencing at time 1 compared to 10% in the comparison group. These percentages (which reduced to 34% in the hand injury group and remained at 10% in the comparison group at time 2) are not as high as the figures of 88% reported by Grunert et al. (1988c) within five days following injury and of 63% at a two month follow-up. However, this category of trauma re-experiencing also includes other symptoms such as reminders and upsetting memories of the event and unpleasant dreams, preventing any direct comparison.

The prevalence figures for avoidance of 20% at initial interview and 22% at a four to six month follow-up according to the PTSD-I (and 12% at initial interview and 8% at four to six month follow-up as measured by the cut-off point on the Impact of Event Scale) are also less than Grunert et al.’s (1992b) figures of 68% at initial interview and 61% at six months in non-occupationally injured adults, and 48% at initial interview and 83% at six
months in an occupationally injured group. This difference may partly relate to the fact that the latter figures were not based on standardized instrument scales. Nevertheless, it is interesting to note that the prevalence rate of avoidance in the present study increased by 2% at time 2, less than the 35% increase in Grunert et al.'s (1992b) occupationally injured sample. This may suggest a more severe avoidance reaction in Grunert et al.'s (1992b) study. Despite the decline in increased arousal in the hand injury group (from 36% to 26% at time 2), this still represents a fair proportion of individuals who were suffering from disturbed autonomic arousal several months after the injury. A rather surprising finding was that a greater proportion of individuals in the hand comparison group obtained an intrusion score beyond the cut-off point of 19 on the Impact of Event Scale, compared to the hand injury group at time 1 (15% versus 8% respectively). It was noted that these affected individuals in the comparison group were distressed either by their hand deformity or discomfort which was considerably improved at time 2. Thus, no person in the comparison group scored beyond this cut-off point at time 2, whilst the proportion of individuals with hand injuries experiencing an intrusion score above this cut-off point failed to decrease.

Initial mean intrusion and avoidance scores on the Impact of Event Scale were similar to those found by Brom et al. (1993) in victims of serious traffic accidents, although the results in this study at a mean follow-up of 4.6 months (with an intrusion score of 7.26 and an avoidance score of 6.74) are higher than the means of 4.2 for intrusion and 3.3 for avoidance at a six month follow-up found by Brom et al. (1993). Thus, as with road traffic accident victims, the subsequent emotional distress of a hand injury in terms of disturbing intrusive thoughts and imagery should not be dismissed.

4.1.2 Prevalence of PTSD

Despite the lack of available studies with which to compare overall estimates of the prevalence rates of PTSD in hand injury victims, the prevalence rates of 8% for a current (and lifetime diagnosis) for PTSD in the hand injured individuals
at both time 1 and time 2, are similar to the 10% figures reported by Malt (1988) in victims of traffic accidents at six months. These prevalence rates are, however, higher than the rates of 3.5% for individuals in the USA exposed to physical attack (Helzer et al., 1987), but less than the rates of 25% at six weeks and 14% at six months reported by Feinstein and Dolan (1991) in victims of physical trauma.

Interestingly, the two male individuals with hand injuries who met the criteria for both a current and lifetime diagnosis of PTSD sustained their injuries between two and a half and three years ago and were both non-occupationally related. In terms of functional loss and appearance, one individual who had suffered amputation and replantation of the hand had regained partial functioning but normal appearance. He reported experiencing no psychological symptoms until nine months after the injury when he suffered from flashbacks reminiscent of the noise of machinery that caused the injury. The other individual had suffered the amputation of two fingers after being crushed beneath falling rubble and had only partial use of the affected hand. Both still perceived that the event had been life-threatening but could not be differentiated from other hand injury victims in terms of the extent of the injury, functional loss sustained nor physical appearance. Their use of both problem- and emotion-focused coping strategies were slightly above the group mean scores at both time 1 and time 2, but their use of specific coping scales showed no obvious deviations from remaining individuals in the group. Their predominant specific coping strategies varied from positive re-interpretation and growth (an emotion-focused strategy) at time 1 to planning and seeking instrumental social support (both problem-focused strategies) at time 2. The other person used mainly acceptance (an emotion-focused strategy) at time 1 and active coping (a problem-focused strategy) at time 2. It is thus interesting that for both individuals, their predominant coping scale was initially an emotion-focused strategy. This may reflect attempts to deal with disturbing negative emotions.
These findings show that PTSD symptoms are not limited to those traumatic events outlined in DSM-III-R (as is recognized in DSM-IV) and that severe PTSD symptoms following traumatic hand injuries may persist up to three years. Moreover, since other individuals existed with more severe injuries and greater functional loss who failed to exhibit as severe post-traumatic stress symptoms, this might provide evidence for the role of psychological variables including the "meaning" of the traumatic event and the way the individual assimilates and processes the event, rather than the severity of the stressor as the key aetiological factor (Feinstein and Dolan, 1991; Perry et al., 1992). These findings might further support those of Seye et al. (1987) that the anatomical defect of hand injuries are not always proportional to the functional and psycho-social repercussions. The fact that both still perceived their injury as life-threatening at the time of its occurrence is consistent with Foa et al.'s (1989) hypothesis of an increased likelihood of developing PTSD when the event is perceived as life-threatening. Closer analysis also revealed that these two individuals achieved the highest avoidance scores on the Impact of Event Scale (one also achieving the highest intrusion score). This may further support Horowitz's (1986) information processing model of PTSD as resulting from an oscillating pattern of intrusive cognitions in response to a sudden traumatic event and avoidant manoeuvres to ward off this internal distress. Confirmation of this hypothesis would obviously require a much larger sample of hand injury victims in order to include sufficient sufferers of PTSD.

Cone and Hueston (1974) suggest that the occurrence of an injury whilst people are unconscious is likely to promote denial. This could account for the persistent distress in one of these affected persons who reported losing consciousness for at least several days after the accident. Alternatively, it might be argued that losing consciousness should reduce the likelihood of developing PTSD due to limited memories of the traumatic event.
4.1.3 Flashbacks

A range of triggers to flashbacks or increased feelings of anxiety were identified in this study including olfactory stimuli (the smell of grass, evoking reminders of a lawnmower) and auditory stimuli including the sound of a hairdryer (reminiscent of a chainsaw) and loud bangs on television (reminiscent of a firework explosion).

Delayed experience of flashbacks was reported by two individuals (four to five months after their injury). In addition, whilst Grunert et al. (1992a) found that debilitating flashbacks may continue up to 18 months after injury, one person in the present study continued to experience significantly distressing flashbacks at two and a half years post injury.

4.1.4 Anxiety and depression

Contrary to expectation and the findings of Grunert et al. (1992a) of frequent and persistent depression in individuals with hand injuries, depression scores on the HAD (Zigmond and Snaith, 1983) were not significantly higher than in the comparison group. However, the use of the HAD standardized scale for the assessment of depression in this study may partly account for this disparity. Also, despite the lack of a statistically significant difference in depression scores, two individuals with hand injuries were diagnosed as suffering from clinical depression and prescribed anti-depressant medication by their GP (one, two weeks after their injury and the other, two and a half years after the accident).

In addition, only one person in the comparison group compared to five in the hand injury group achieved a score of seven or above on the HAD scale either at time 1 or time 2. These findings may therefore support depressive symptoms as an additional post-traumatic reaction.

Moreover, significantly higher HAD anxiety scores were noted at time 1 in the hand injury group compared to the comparison group. Whilst only one person scored over the recommended cut-off point of 10 on the anxiety subscale for a probable disorder of mood at time 1 and three people (13%) at time 2, (less than that reported by Grunert et al. (1992a) of 31% at three months and 20% at six
months), no individuals in the comparison group scored beyond this cut-off point in the present study.

4.1.5 Emotional distress and impact on self-confidence
In further support of the hypothesized impact of hand injuries on psychological functioning, significantly higher ratings of emotional distress relating to the hand condition was reported by the hand injury group at the second follow-up (when ratings reduced only minimally). The failure of these ratings to reach statistical significance at initial interview, may be attributable to variability which was especially high in the comparison group.

The hand injury group also reported their self-confidence to be lowered more than did the comparison group, particularly at second follow-up. Although these differences were not significant, they are consistent with the impact of a hand injury on self-image (Cohney, 1978).

Whilst no significant differences were found between the two groups in terms of positive affect scores on the PANAS, significantly higher negative affect in the hand injury group at time 1 provides further indication of the adverse effects of a traumatic hand injury on mood state.

4.2 Potential confounding variables
Despite these statistically significant group differences, caution is required in interpreting the findings due to a number of factors.

4.2.1 Recent environmental stressors
At time 1, 48% of the hand injury group compared to 35% of the comparison group reported having experienced one or more stressful life event during the previous 12 months. This could either reflect reality (in which case this may have contributed to the greater psychological morbidity in the hand injury group) or may be a "reporting bias" from the increased likelihood of remembering unpleasant events after recently experiencing a traumatic event. However, this pattern was reversed during the interval between time 1 and time 2, when a relatively greater proportion of people in the comparison group
(47%) reported experiencing one or more stressful life event compared to 30% in the hand injury group.

4.2.2 The role of social support
Although the hand injury group consisted of more single people, the extent of social support received and its helpfulness were rated significantly higher by individuals with hand injuries compared to the comparison group at time 1 (failing to reach significance at time 2). In view of the proposed inverse relationship between social resources and psychological impairment (Billings and Moos, 1981), the present results are thus unlikely to be biased towards the comparison group by an ameliorating effect of social support.

4.2.3 Demographic variables including age
The two groups were comparable in terms of the body site of injury, handedness and whether the dominant or non-dominant hand was affected. Although they were also matched in terms of gender and years of education, the comparison group was significantly older than the hand injury group. It might be argued that less psychological distress would be expected in the comparison group (in which eight people were retired) than in the injury group (in which only one person was retired) since the threat of work loss and financial difficulties would be less in this group. On the other hand, this effect might be partly balanced by the influence of aging on physical health, including sensory loss (Woods and Britton, 1985), whilst the psychological effect of a hand injury on body image may also be more frequent in the younger age group (Cohney, 1978).

4.3 The role of coping strategies
4.3.1 Differences in use of problem- versus emotion-focused coping
Compared to the comparison group, the hand injury group reported significantly greater use of emotion-focused coping at time 2. Their use of both problem- and emotion-focused coping was greater than for the comparison
group at time 1, although not to a significant extent. This increased use of emotion-focused coping may relate to individuals appraising their situation as something having to be accepted (Folkman and Lazarus, 1980). Support for this hypothesis is gained from the greater proportion of individuals in the hand injury group compared to the comparison group whose predominant specific coping scale was acceptance at time 2.

The present findings might indicate greater engagement in both forms of coping strategies following experience of a stressful encounter (Folkman and Lazarus, 1980). This finding also parallels Folkman's (1984) suggestion that since heightened emotions are likely to interfere with the cognitive activity required for problem-focused coping, problem-focused coping is likely to be accompanied by emotion-focused coping.

A further interesting shift within the hand injury group occurred between time 1 (when there was a non-significant tendency for more use of problem-focused coping compared to emotion-focused coping) and time 2 (when use of problem-focused coping reduced and both types of coping strategies were almost equally employed). This greater use of problem-focused coping at time 1 might be accounted for by more active attempts to change things (including active exercises) and the need to make plans for the future, which, after a long interval following the hand injury were required less.

4.3.2 Associations between psychological distress and problem- versus emotion-focused coping

Contrary to expectation, measures of psychological distress were not all positively and more strongly correlated with emotion-focused coping compared to problem-focused coping. Some measures correlated with both emotion- and problem-focused coping, whilst other associations were in the opposite direction to what was expected. However, even where significant associations were observed, none rose above $r = 0.69$, accounting for no more than 47.6% of the variance in common.
Thus, in the hand injury group both emotion- and problem-focused coping were positively correlated with the PTSD-I categories of trauma re-experiencing, avoidance, increased arousal and total PTSD-I scores at time 1. These correlations with emotion-focused coping did, however, account for more common variance than those with problem-focused coping, particularly for trauma re-experiencing and increased arousal at time 1. At time 2, increased arousal was, surprisingly, more strongly correlated with problem-focused coping than emotion-focused coping, whilst trauma re-experiencing and avoidance remained most strongly correlated with emotion-focused coping. These latter findings are consistent with the proposed function of emotion-focused coping as an attempt to control distressing emotions (Folkman, 1984), thereby preventing use of problem-focused coping (Lazarus and Folkman, 1984) and with Malt's (1992) findings of a significant relationship between avoidance and emotion-focused coping in male accident victims. Such avoidance may reflect an intrapsychic way of processing the trauma and thus resemble a form of coping.

Significant relationships were found between both intrusion and avoidance on the Impact of Event Scale and emotion-focused coping at time 1. However, the size of these relationships was similar for problem-focused coping, in contrast to the findings of Malt (1992) where emotion-focused coping showed the highest correlations.

Also contrary to the hypothesized relationship between emotional distress and emotion-focused coping, subjective ratings of emotional distress in the hand injury group tended to be more positively associated with problem-focused coping at time 2 than with emotion-focused coping. Perhaps such distress did not involve sufficient intrusive cognitive activity to disrupt problem-solving. Whilst the correlations between emotion-focused coping and intrusion and avoidance on the Impact of Event Scale at time 2 were weaker than for trauma re-experiencing and avoidance according to the PTSD-I, the category of trauma re-experiencing on the PTSD-I comprises a more global assessment than intrusion on the Impact of Event Scale (including intrusive, upsetting...
memories of the event, recurrent unpleasant dreams, sudden acting or feeling as if the event was recurring and distress at exposure to reminders of the trauma). The PTSD-I is also a more finely graded rating scale from 1 (no or never) to 7 (extremely or always) compared to the Impact of Event Scale where items are rated on a scale of not at all (=0), rarely (=1), sometimes (=3) or often (=5). Compared to the Impact of Event Scale, the PTSD-I also differentiated the two groups more clearly on the categories of trauma re-experiencing and avoidance in terms of mean scores obtained at both times of assessment, resulting in significant between-group differences.

The tendency at time 2 for avoidance on the PTSD-I in the comparison group to be correlated with problem-focused coping to a greater extent than with emotion-focused coping seems contradictory, but might be reconciled by an alternating behavioural strategy between cognitive avoidance and active problem-solving.

As expected, however, emotion-focused coping correlated with increased arousal at time 2 more than with problem-focused coping.

These findings in the comparison group may be a reflection of the different type of hand condition. The tendency for a more positive association between avoidance and emotion-focused coping observed in the hand injury group and in Malt’s (1992) sample of male accident victims may only hold for victims of traumatic events.

4.3.3 The relationship between problem- and emotion-focused coping, HAD anxiety and depression and positive and negative affect

As was the case with individual PTSD-I categories in the hand injury group, both problem- and emotion-focused coping were positively associated with HAD anxiety and depression scores and accounted for similar proportions of common variance, thus failing to support the hypothesized negative impact of emotion-focused coping in accident victims (Malt, 1992). One difference, in support of the hypothesis, was the stronger correlation between depression and emotion-focused coping (at time 2) reflecting 27% of common variance,
compared to that with problem-focused coping, accounting for only 9.6% of common variance. Also, in partial support of the hypothesis, whilst negative affect (as assessed by the PANAS) was positively associated with both problem- and emotion-focused coping at time 1, this association was noticeably larger with emotion-focused coping at time 2.

Contrary to what might be expected, positive affect showed no positive relationship with problem-focused coping, suggesting no obvious beneficial influence of problem-focused coping on mood state.

The finding in the comparison group of a stronger correlation between both anxiety and depression and problem-focused coping than with emotion-focused coping confirms the diverging pattern of results in this non-traumatized group.

4.3.4 Evidence for the maladaptiveness of emotion-focused coping

As hypothesized, in the hand injury group correlations between emotion-focused coping at time 1 and measures of psychological distress at time 2 were stronger than those between problem-focused coping at time 1 and psychological distress at time 2, with respect to total PTSD-I scores, intrusion on the Impact of Event Scale and depression on the HAD scale. The failure of these differences between correlations to reach statistical significance might be attributable to large variation in PTSD-I scores and the small numbers of participants involved (due to the nature of the research and time restraints to conduct the study). A similar study with larger numbers involved might produce significant effects. Thus, the trend of these results is in the expected direction and provides tentative but not conclusive evidence for the maladaptiveness of emotion-focused coping compared to problem-focused coping (Solomon et al., 1988a and Malt, 1992).

Contrasting results in the comparison group (where no significant correlations emerged between either coping strategy at time 1 and measures of distress at time 2) are important, suggesting that the impact of emotion- versus problem-focused coping may be exclusive to traumatized individuals.
4.3.5 The circularity issue
Despite these positive associations between emotion-focused coping and PTSD-I symptoms (at both time 1 and time 2), anxiety and depression scores and negative affect, it must be remembered that none of these correlations explained more than 47.6% of the common variance. Additional factors therefore need to be included to account for the development of post-traumatic symptoms. These results may reflect the transactional perspective of dysfunction which requires consideration of social, psychological and physiological influences (Lazarus, 1980). Moreover, an important methodological problem relates to the circularity issue, since coping styles may either be a cause or a result of psychological distress. An attempt was made to address this problem (as recommended by Mikulincer and Solomon, 1989) by the use of cross-lagged panel analysis to assess the cause-effect relationship between two variables measured concomitantly at two points in time. Since the majority of individuals in the hand injury group were interviewed within the first eight weeks of their injury, this should enable the assessment of any causal link between coping and symptoms of psychological distress, particularly PTSD.

4.3.6 Direction of causality regarding emotion-focused coping
The finding of larger correlations between emotion-focused coping at time 1 and both total PTSD-I scores and anxiety at time 2 compared to correlations between either total PTSD-I scores at time 1 or anxiety and emotion-focused coping at time 2, is suggestive of a causal influence of emotion-focused coping on these variables. The same causal influence of emotion-focused coping on intrusion is suggested by the positive (although non-significant) association with emotion-focused coping at time 1 and intrusion scores on the Impact of Event Scale in the absence of a positive association between intrusion at time 1 and emotion-focused coping at time 2. Again, however, the present findings provide no conclusive evidence for the negative causal effect of emotion-focused coping, since none of these correlations were statistically different.
4.3.7 Direction of causality regarding problem-focused coping

The above findings in the hand injury group are complicated by the positive association between problem-focused coping at time 1 and anxiety at time 2. Another unexpected finding was the bi-directional relationship between problem-focused coping and total post-traumatic symptomatology. This would appear to contradict the hypothesis that problem-focused coping has a purely positive impact on psychological outcome.

These findings might be reconciled by the simultaneous influence of both emotion- and problem-focused coping on anxiety and post-traumatic symptoms, given that emotion-focused coping is likely to accompany problem-focused coping in most stressful encounters (Folkman and Lazarus, 1980). In spite of these attempts to overcome the issue of circularity, the potential interaction with additional variables such as threat, loss or challenge appraisal and concomitant environmental demands must be recognized.

Examination of these correlations at an additional follow-up and with a larger sample size, would help clarify this pattern of results, particularly since the relative impact of cognitive, environmental characteristics may change with time.

4.3.8 Perceived coping ability

As might be expected, individuals with hand injuries also differed from the comparison group in that they perceived themselves to be coping less well with their hand condition than the comparison group at time 1 and (to a nonsignificant degree) at time 2. This could be due both to a difference in coping resources employed and to the greater frequency of overriding intrusive activity and a downward spiral of negative affect including anxious thoughts (Saigh, 1992).
4.3.9 The relationship between subjective ratings of coping efficacy and problem-focused coping

Contrary to the initial hypothesis, no positive association was found in this study between subjective ratings of coping efficacy and the use of problem-focused coping as assessed by the COPE (Carver et al., 1989). However, the correlation between emotion-focused coping and VAS ratings of coping efficacy showed a tendency towards an inverse relationship in the comparison group. This is consistent with the proposed negative impact of emotion-focused coping on psychological outcome (Billings and Moos; Solomon et al., 1988a; Blake et al., 1992; Fairbank et al., 1991 and Nezu and Carnevale, 1987).

4.4.0 Other potential mediating variables on coping

Differences in appraisal of hand injury/hand condition along the dimensions of "matters," predictability and threat

Whilst the hand injury group reported their condition as mattering to them more than did the comparison group at both time intervals, these differences were not significant. Similarly, no significant between-group differences were found in ratings of how predictable or unpredictable the accident or onset was. These variables of importance or predictability thus seem unlikely to account for differences in experience of psychological reactions between the two groups. However, as might be expected, significantly higher perceptions of how threatening the hand injury (or hand condition) was at both times of assessment, support the differential effects of a hand trauma compared to a non-traumatic hand condition.

In view of Foa et al.'s (1989) hypothesis of an increase in PTSD symptoms associated with events perceived as life-threatening, the finding that over half the hand injury group reported feeling that their injury was life-threatening at the time of its occurrence is important. Since none of the comparison group perceived their condition as life-threatening, this factor may explain some of the differences in post-traumatic symptomatology in the hand injury group. Feinstein and Dolan (1991) likewise suggested that high scores on the Impact of
Event Scale might be accounted for by the fact that 60% of their sample rated their event as life-threatening (similar to the proportion of 52% of individuals at time 1 in the present study).

4.5 The relationship between appraisal of the hand injury/hand condition as threatening and measures of psychological distress

In support of the original hypothesis, perceived ratings of how threatening the hand injury was at the time of its occurrence were positively related to trauma re-experiencing at time 2 and to ratings of distress on the PTSD-I (although this relationship was only significant at time 1 and still accounted for only 24% of the common variance). Whilst threat was also positively associated with VAS ratings of emotional distress at time 2, positive correlations of threat intensity and intrusion and avoidance on the Impact of Event Scale at time 2 accounted for only 9% of common variance. These findings suggest that the positive relationship between threat and PTSD symptoms (noted by Solomon et al. (1988) in war casualties) is not as marked in individuals with hand injuries and may be greatest after several months rather than weeks following the injury.

The lack of a significant association between perceived threat and HAD anxiety scores is surprising in view of the proposed negative emotions (including anxiety and depression) that accompany threat appraisals and direct coping away from problem-solving (Folkman, 1984). Perceived threat was, however, more positively associated with depression at time 2, although the size of this relationship accounted for only a small proportion (7.8%) of common variance. The positive association at time 2 between threat and positive affect (rather than negative affect) is also contrary to what was predicted. Perhaps this relates to a simultaneous increase in vigilance and alertness (subsumed by the positive affect scale on the PANAS (Watson et al., 1988) which includes the items "alert," "inspired" and "attentive").

The more positive association between threat intensity and emotion-focused coping than problem-focused coping at time 2 is in the direction of the findings of Solomon et al. (1989). However, this association is unremarkable in size,
accounting for only 7.8% of common variance, thus providing only weak support for Folkman's (1984) notion that perceived threat, with the resultant distressing emotions directs coping towards excessive emotional regulation, impeding problem-focused coping efforts.

Findings in the comparison group were again distinguishable from those in the hand injured group by the lack of any significant correlations between threat and either PTSD-I symptoms or depression. The unexpected tendency for threat to be positively correlated with positive affect and with problem-focused coping at time 1 might also be explained by a related increase in both alertness and positive attempts to resolve the situation by active problem-solving. This relationship between threat and problem-focused coping reversed at time 2, when threat showed a tendency towards a negative association with both positive affect and both forms of coping. Although there was little change in mean perceived ratings of threat between time 1 and time 2, it is possible that the nature of the threat changed to a more negative appraisal at time 2. Alternatively, this pattern of results may reflect the negative long-term effects of perceiving a hand condition as threatening, resulting in passive rather than active coping tendencies. This explanation is also consistent with the marked decrease in problem-focused coping at time 2.

Obviously, simultaneous assessment of these multiple variables makes it difficult to clearly determine causal influences. Moreover, these results may be influenced by more stable personality traits such as internal versus external locus of control or neuroticism.

The issue of circularity must also be considered with respect to appraisal. Thus, the intensity of perceived threat will partly be a function of a person's evaluation of coping resources, whilst threat intensity may also affect the utilization of available coping. This issue can only be resolved by further attempts to demonstrate antecedents and consequences of appraisal such as psychological distress and coping.
4.5.1 The possible impact of primary appraisal (threat, loss or challenge appraisals)

The predominant tendency for the hand injury group to evaluate their injury as a loss was particularly striking at time 2 when 75% of individuals made this type of appraisal, whilst challenge appraisals were the commonest form of appraisal in the comparison group (and significantly more than in the hand injury group). Another important finding is that threat appraisals were almost equally common in either participant group at time 1, but reduced by almost half in the comparison group at time 2.

Thus, reappraisal occurred for many individuals in both participant groups. For some individuals in the comparison group this may have been a defensive reappraisal to view present threats in less damaging ways (Lazarus and Folkman, 1984). Alternatively (and perhaps more likely), this change in the comparison group was attributable to changes in external demands following improvements in the hand condition after attempts (for a number of individuals) to surgically correct the Dupuytren's contractures.

Since challenge appraisals are likely to facilitate problem-focused coping, promoting a more successful outcome, whilst threat appraisals interfere with cognitive functioning and problem-solving (Folkman, 1984), the above results are also consistent with the greater prevalence of PTSD symptoms in the hand injury group who also used more emotion-focused coping than the comparison group at time 1. A corresponding increase in problem-focused coping did not occur with this predominance of challenge appraisals in the comparison group at time 2. However, these results are further consistent with the reduction in VAS ratings of emotional distress within the comparison group from time 1 to time 2 (and with the finding that these ratings were significantly lower in the comparison group compared to the hand injury group at time 2 and to a nonsignificant level at time 1).
4.6 The role of controllability

The lack of any significant differences between the two groups in terms of perceived control over their hand injury or hand condition (both at the time of the hand injury, or onset of the hand condition, and at the present time) suggests that controllability was not a critical variable in accounting for psychological adjustment. These findings are compatible with those of Solomon et al. (1988a) and Mikulincer and Solomon (1989) of no direct relationship between locus of control or causal attribution and combat-related psychopathology including PTSD intensity (an association which was mediated by coping strategies).

Nevertheless, the present study did not address attribution along its dimensions of internal/external; stable/unstable; global/specific or controllable/uncontrollable. Moreover, as Mikulincer and Solomon (1989) acknowledge, there is no definite evidence regarding the direction of causality between causal attribution and coping strategies.

This study also failed to examine the possibility of poor outcome following appraisal of an event as uncontrollable when it is in fact controllable (Folkman, 1984).

4.7 Qualitative analysis of most and least helpful ways of coping

Qualitative analysis confirmed that social support from family or friends was a more frequently endorsed helpful way of coping in the hand injury group than in the comparison group (particularly at time 1). This indicates that although social support was perceived as beneficial, it does not prevent the subsequent onset of distress.

At time 2, thinking positively preceded social support as the most frequent helpful way of coping. Social support was less frequently endorsed by individuals in the comparison group who tended to describe a more self-reliant, resolute approach to coping including "trying to think positively," "I've got to go for it," or "things won't beat me." This difference in reported coping
Whilst the present study was designed to investigate the traumatic aspect of the hand injury on psychological functioning, interesting comparisons could also be made with individuals with injuries to other body parts, to analyze the specific impact of an injury to the hand.

Research involving a larger sample size could allow for assignation of individuals according to poor and good outcome categories to further investigate the effects of potentially important influences on outcome (including coping strategies and differences in appraisal factors such as perceived threat).

Finally, clinical intervention-based studies might seek to confirm the hypotheses investigated in this study, in particular, to determine whether advice and training to employ more active problem-solving strategies serves to mitigate the experience of post-traumatic symptomatology following hand injuries.

In conclusion, the ability to generalize from the present findings is limited by the problems involved in coping research and by the age bias and small sample size involved. Nevertheless, the results from this investigation have immediate relevance to understanding the psychological reactions suffered by individuals with hand injuries to promote rehabilitation.
Appendix 1

Patient Information Sheet

The main purpose of this study is to investigate the effects of using various forms of coping reactions in people who have suffered from injuries to the hand compared to people who suffer from some other condition affecting the hand. This may provide valuable information regarding the least and most helpful forms of coping response and help identify ways in which the future recovery of people with hand injuries can be improved.

If you agree to take part in the study, you will be interviewed on two occasions by myself and will be asked to fill in some questionnaires. The first interview should coincide with your routine outpatients appointment, as may the second interview where possible. Each interview will last about an hour. The second interview will take place between 4-6 months later.

Your care and treatment will otherwise be exactly the same as if you decided not to take part in the study.

Refusal to take part in the study will not prejudice the care or treatment you receive in any way.

If you do agree to take part, any records which identify you will be kept completely confidential. In the write-up of the study no names will be mentioned and you will not be identifiable by any other means.

You will also be free to withdraw from the study at any time without giving a reason and without prejudicing your care or jeopardising your relationship with the medical staff.
Appendix 2

Consent Form

The nature of this study has been explained to me by Lynne Hopkinson, Trainee Clinical Psychologist. I agree to take part in the study on the understanding that any information I provide will be held confidential. I understand that I may withdraw from the study at any time if I wish to and that this will not prejudice my treatment in any way.

Signed by:

Name:

Date:

Countersigned by: Designation:

Date:
Appendix 3. Preliminary information to be obtained

Name: ____________________________  I.D: ____________________________  Date: ____________________________

Age: ____________________________

Sex: M / F

Number of years of education: ____________________________

Marital status: Single / Married / Widow/widower / Divorced / ? Children

Employment status / occupation: ____________________________

? Right or left-handed: ____________________________

? Previous mental illness / head injury: ____________________________

Current medical conditions:

--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

? Currently taking any medication:

--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Age of occurrence of injury / onset of deformity: ____________________________

Nature and duration of the event leading to injury:

--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Injuries sustained:

--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------
Number of hospitalizations / operations as a result of injury / hand condition:

Number of stressful life events in the preceding year e.g. divorce, separation, bereavement, job change / loss, loss of social contacts, financial or legal difficulties:
Appendix 4

Semi-structured interview

Name: ID: Date:

The following questions, which I will read out to you, are to find out about particular characteristics of your hand injury/hand condition. Please be as honest as possible. Also, please feel free to provide any additional information which may be relevant, either after each question or at the end of the questionnaire.

1. Can you tell me on a scale of 0 to 10, where 0 = does not matter at all and 10 = matters a great deal to me, what number you would use to describe the extent to which your hand injury/hand condition matters to you? 

Comments:

2. Looking back at the time of your hand injury/onset of your hand condition, how much did you feel you could or could not control or do something about the accident/onset? Again, please can you select a number from 0 to 10 where 0 = I could do nothing at all to control the accident/onset and 10 = I had complete control over the accident/onset.

Comments: 

3. How much do you now feel you can control or do something about your hand injury/hand condition? (using the same scale of 0 to 10)

Comments: 

4. Looking back at the time of your injury/ hand condition occurring/developing, how threatening or unnerving would you say this experience was to you personally, where 0 = not at all threatening or unnerving and 10 = extremely threatening or unnerving?

Comments: 

5. At the time of your hand injury/hand condition occurring/developing, did you feel that the event was life-threatening?

   Yes ___  
   No ___

Comments:

6. Do you now feel that the event was life-threatening?

   Yes ___  
   No ___

Comments:

7. Looking back at the time of your hand injury/onset of your hand condition, how predictable or unpredictable did you feel the accident/onset was, where 0 = not at all predictable and 10 = extremely predictable? _____

Comments:

8. To what extent do you feel that what has happened to you has affected your self-confidence, where 0 = has not lowered my self-confidence at all and 10 = has completely lowered my self-confidence? __________

Comments:

9. How much support have you received from either family members, friends or acquaintances, where 0 = no support at all and 10 = considerable support?_________

Comments:
10. How helpful would you describe this support as a means of coping with your hand injury/hand condition, where 0 = not at all helpful and 10 = extremely helpful? ____

Comments:

11. Please describe any other factors which you feel have made your hand injury/hand condition more or less stressful for you.

Thank you. Is there any additional information which you feel may be important?
Appendix 5  PTSD interview (PTSD-1)  Watson et al. (1991)

Name:  
ID:  
Date:  

"I would now like to ask you some questions relating to your hand or other distressing events you may have been through."

List of questions to be read out:

A-1 (a) "How distressed were you at the time of your hand accident / at the time of your hand condition being made known to you, choosing a number from 1 (Not at all distressed) to 7 (extremely distressed)?" (Show client rating key 1, pointing from 1 to 7).

(b) "Before that happened, have you ever been through any sudden, unusual, distressing event which would be very distressing to almost anyone?"

If Yes, "what was it?"

(c) "Approximately when did this happen?"

Date:  

If answer to A-1(b) is Yes, omit A2 and ask A3.

If answer to A-1(b) is No, ask A2:

A-2 (a) "What was the most horrible or frightening thing that you have experienced?"

(b) "Approximately when did this happen?"

Date:  

A-3. If an event listed in either A-1 or A-2 is both unusual ("outside the range of usual human experience") and severe ("likely to evoke significant stress symptoms in almost anyone"), it is defined as a trauma. If either or both criteria cannot be met, assume that the client has not experienced a trauma.
Has the client experienced a trauma?  
Yes ____
No ____

Now give the client a copy of rating key 2. Say: "I am going to read you a list of questions and for each question I would like you to choose the correct answer from this rating key using a number from 1 (No or Never) to 7 (Extremely or Always)."
## Rating Key

<table>
<thead>
<tr>
<th>Rating</th>
<th>Very little</th>
<th>A little</th>
<th>Somewhat</th>
<th>Quite a bit</th>
<th>Very much</th>
<th>Extremely</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never</td>
<td>Very rarely</td>
<td>Sometimes</td>
<td>Commonly</td>
<td>Often</td>
<td>Very often</td>
<td>Always</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
</tbody>
</table>

---

**B-1.** Have upsetting memories of (cite the stressor listed above here and in each item below) frequently pushed themselves into your mind at times?

**B-2.** Have you had recurring unpleasant dreams about (the stressor)?

**B-3.** Have you ever suddenly acted or felt as if (the stressor) were happening again? This includes flashbacks, illusions, hallucinations or other “re-livings” of the event, even if they occur when you are intoxicated or just waking up.

**B-4.** Have things that reminded you of (the stressor) sometimes upset you a great deal?

---

**C-1.** Have you ever tried to avoid thinking about (the stressor) or feelings you associate with it?

**C-2.** Have you sometimes avoided activities or situations that remind you of (the stressor)?

**C-3.** Have you found you sometimes couldn’t remember important things about (the stressor)?

**C-4.** Have you lost a lot of interest in things that were very important to you before (the stressor)?

**C-5.** Have you felt more cut off emotionally from other people at some period than you did before (the stressor)?

**C-6.** Have there been times when you felt that you did not express your emotions as much or as freely as you did before (the stressor)?

**C-7.** Have there been periods since (the stressor) when you felt that you won’t have much of a future— that you may not have a rewarding career, a happy family, or a long, good life?

---

**D-1.** Have you had more difficulty falling asleep or staying asleep at times than you did before (the stressor)?

**D-2.** Have you gotten irritated or lost your temper more at times than you did before (the stressor)?

**D-3.** Have there been periods since (the stressor) when you had more trouble concentrating than you had before it?

**D-4.** Have there been times when you were more overly alert, watchful, or super-aware of menacing noises or other stimuli than you were before (the stressor)?

**D-5.** Have there been times since (the stressor) when unexpected noise, movement, or touch startled you more than they did before?

**D-6.** Have things which reminded you of (the stressor) made you sweat, tense up, breathe hard, tremble, or overrespond in some other physical way?
E-1. Have you had these problems at least a few times a week for at least a month sometime since (the stressor)?

E-2. Have you had these problems at least a few times each week over the past month?

When did these feelings or problems first occur (month and year)?

SUMMARY

Does the interviewee meet the DSM-III-R criteria for:

Section A. History of trauma
("yes" response to item A-3?)

Yes _______ No _______

Section B. Trauma reexperiencing
(at least one "4" or higher response to items B-1, B-2, B-3, and/or B-4)?

Yes _______ No _______

Section C. Avoidance of stimuli associated with trauma
(at least three "4" or higher responses to items C-1, C-2, C-3, C-4, C-5, C-6, and/or C-7)?

Yes _______ No _______

Section D. Increased arousal
(at least two "4" or higher responses to items D-1, D-2, D-3, D-4, D-5, and/or D-6)?

Yes _______ No _______

A lifetime PTSD diagnosis ("yes" responses to Summary Sections A, B, C, and D, and to item E-1).

Yes _______ No _______

A current PTSD diagnosis ("yes" responses to Summary Sections A, B, C, D, and to item E-2).

Yes _______ No _______

PTSD-I Overall Frequency/Severity score
(Sum of items B-1 through D-6).

________
**IMPACT OF EVENT SCALE**

Below is a list of comments made by people after stressful life events. Please read each item and indicate how frequently these comments were true for you **DURING THE LAST SEVEN DAYS** by placing a tick in the appropriate box. If they did not occur during that time, please tick the "not at all" column.

<table>
<thead>
<tr>
<th>DURING THE PAST 7 DAYS</th>
<th>NOT AT ALL</th>
<th>RARELY</th>
<th>SOMETIMES</th>
<th>OFTEN</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I thought about it when I didn't mean to.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. I avoided letting myself get upset when I thought about it or was reminded of it.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. I tried to remove it from memory.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. I had trouble falling asleep or staying asleep because of the pictures and/or thoughts about it that came into my mind.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. I had waves of strong feelings about it.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. I had dreams about it.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. I have stayed away from reminders of it.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. I have felt as if it hadn't happened or it wasn't real.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. I have tried not to talk about it.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. Pictures about it popped up into my mind.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11. Other things kept making me think about it.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12. I was aware that I still had a lot of feelings about it, but I didn't deal with them.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13. I have tried not to think about it.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14. Any reminders brought back feelings about it.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15. My feelings about it have been sort of numb.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The Hospital Anxiety and Depression Scale


This questionnaire will help you to let us know how you are. Read each item and underline the response which comes closest to how you have felt in the last few days. Don’t take too long over your replies, your immediate reaction will probably be more accurate than a long thought out response.

<table>
<thead>
<tr>
<th>Item</th>
<th>Ratings</th>
</tr>
</thead>
<tbody>
<tr>
<td>I feel tense or ‘wound up’</td>
<td>3</td>
</tr>
<tr>
<td>Most of the time</td>
<td></td>
</tr>
<tr>
<td>A lot of the time</td>
<td></td>
</tr>
<tr>
<td>From time to time, occasionally</td>
<td></td>
</tr>
<tr>
<td>Not at all</td>
<td></td>
</tr>
<tr>
<td>I still enjoy the things I used to enjoy</td>
<td>0</td>
</tr>
<tr>
<td>Definitely as much</td>
<td></td>
</tr>
<tr>
<td>Not quite so much</td>
<td></td>
</tr>
<tr>
<td>Only a little</td>
<td></td>
</tr>
<tr>
<td>Hardly at all</td>
<td></td>
</tr>
<tr>
<td>I get a sort of frightened feeling as if something awful is about to happen</td>
<td>3</td>
</tr>
<tr>
<td>Very definitely and quite badly</td>
<td></td>
</tr>
<tr>
<td>Yes, but not too badly</td>
<td></td>
</tr>
<tr>
<td>A little, but it doesn’t worry me</td>
<td></td>
</tr>
<tr>
<td>Not at all</td>
<td></td>
</tr>
<tr>
<td>I can laugh and see the funny side of things</td>
<td>3</td>
</tr>
<tr>
<td>As much as I always could</td>
<td></td>
</tr>
<tr>
<td>Not quite so much</td>
<td></td>
</tr>
<tr>
<td>Definitely not so much now</td>
<td></td>
</tr>
<tr>
<td>Not at all</td>
<td></td>
</tr>
<tr>
<td>Worrying thoughts go through my mind</td>
<td>3</td>
</tr>
<tr>
<td>A great deal of the time</td>
<td></td>
</tr>
<tr>
<td>A lot of the time</td>
<td></td>
</tr>
<tr>
<td>From time to time but not too often</td>
<td></td>
</tr>
<tr>
<td>Only occasionally</td>
<td></td>
</tr>
<tr>
<td>I feel cheerful</td>
<td>2</td>
</tr>
<tr>
<td>Not at all</td>
<td></td>
</tr>
<tr>
<td>Not often</td>
<td></td>
</tr>
<tr>
<td>Sometimes</td>
<td></td>
</tr>
<tr>
<td>Most of the time</td>
<td></td>
</tr>
<tr>
<td>I can sit at ease and feel relaxed</td>
<td>0</td>
</tr>
<tr>
<td>Definitely</td>
<td></td>
</tr>
<tr>
<td>Usually</td>
<td></td>
</tr>
<tr>
<td>Not often</td>
<td></td>
</tr>
<tr>
<td>Not at all</td>
<td></td>
</tr>
<tr>
<td>I feel as if I am slowed down</td>
<td>3</td>
</tr>
<tr>
<td>Nearly all the time</td>
<td></td>
</tr>
<tr>
<td>Very often</td>
<td></td>
</tr>
<tr>
<td>Sometimes</td>
<td></td>
</tr>
<tr>
<td>Not at all</td>
<td></td>
</tr>
<tr>
<td>I get a sort of frightened feeling like ‘butterflies’ in the stomach</td>
<td>0</td>
</tr>
<tr>
<td>Not at all</td>
<td></td>
</tr>
<tr>
<td>Occasionally</td>
<td></td>
</tr>
<tr>
<td>Quite often</td>
<td></td>
</tr>
<tr>
<td>Very often</td>
<td></td>
</tr>
<tr>
<td>I have lost interest in my appearance</td>
<td>3</td>
</tr>
<tr>
<td>Definitely</td>
<td></td>
</tr>
<tr>
<td>I don’t take so much care as I should</td>
<td></td>
</tr>
<tr>
<td>I may not take quite as much care</td>
<td></td>
</tr>
<tr>
<td>I take just as much care as ever</td>
<td></td>
</tr>
<tr>
<td>I feel restless as if I have to be on the move</td>
<td>3</td>
</tr>
<tr>
<td>Very much indeed</td>
<td></td>
</tr>
<tr>
<td>Quite a lot</td>
<td></td>
</tr>
<tr>
<td>Not very much</td>
<td></td>
</tr>
<tr>
<td>Not at all</td>
<td></td>
</tr>
<tr>
<td>I look forward with enjoyment to things</td>
<td>1</td>
</tr>
<tr>
<td>As much as ever I did</td>
<td></td>
</tr>
<tr>
<td>Rather than less than I used to</td>
<td></td>
</tr>
<tr>
<td>Definitely less than I used to</td>
<td></td>
</tr>
<tr>
<td>Hardly at all</td>
<td></td>
</tr>
<tr>
<td>I get sudden feelings of panic</td>
<td>2</td>
</tr>
<tr>
<td>Very often indeed</td>
<td></td>
</tr>
<tr>
<td>Quite often</td>
<td></td>
</tr>
<tr>
<td>Not very often</td>
<td></td>
</tr>
<tr>
<td>Not at all</td>
<td></td>
</tr>
<tr>
<td>I can enjoy a good book or radio or TV programme</td>
<td>0</td>
</tr>
<tr>
<td>Often</td>
<td></td>
</tr>
<tr>
<td>Sometimes</td>
<td></td>
</tr>
<tr>
<td>Not at all</td>
<td></td>
</tr>
</tbody>
</table>

This scoring device may be folded back prior to completion.
Appendix 8.

Name: ID: Date:

Question after completion of HAD

Please place a short vertical mark anywhere along the horizontal line shown below to indicate how much what has happened to you has disturbed your overall emotional state, from "not at all" to "extremely."

Not at all --------------------------------------------------------- Extremely
Appendix 9

The PANAS (Watson et al., 1988)

Name: ID: Date:

This scale consists of a number of words that describe different feelings and emotions. Read each item and then mark the appropriate answer in the space next to that word. Indicate to what extent you have been feeling this way during the past week.

1. Very slightly or not at all
2. A little
3. Moderately
4. Quite a lot
5. Extremely

____ interested
____ distressed
____ excited
____ upset
____ strong
____ guilty
____ scared
____ hostile
____ enthusiastic
____ proud

____ irritable
____ alert
____ ashamed
____ inspired
____ nervous
____ determined
____ attentive
____ jittery
____ active
____ afraid
"I am now going to show you some cards with a statement typed on each one. Please read the statement on each card and indicate, by telling me the number of the most appropriate answer" (show typed sheet with scale on, point to numbers and then answers) "to what extent you have used it to recently deal with the reaction to your hand.

There are no "right" or "wrong" answers, so please choose the most accurate answer for YOU - - not what you think "most people" would say or do. Indicate what YOU have been doing recently to deal with the reaction to your hand."

List of statements (to be shown on individual cards).

1. I have been trying to grow as a person as a result of the experience.
2. I have been turning to work or other substitute activities to take my mind off things.
3. I have been getting upset and letting my emotions out.
4. I have been trying to get advice from someone about what to do.
5. I have been concentrating my efforts on doing something about it.
6. I have been saying to myself "this isn't real."
7. I have been putting my trust in God.
8. I have been admitting to myself that I can't deal with it, and quit trying.
9. I have been restraining myself from doing anything too quickly.
10. I have been discussing my feelings with someone.
11. I have been getting used to the idea that it happened.
12. I have been talking to someone to find out more about the situation.
13. I have been keeping myself from getting distracted by other thoughts or activities.
14. I have been daydreaming about things other than this.
15. I have been getting upset, and am really aware of it.
16. I have been seeking God's help.
17. I have been making a plan of action.
18. I have been accepting that this has happened and that it can't be changed.
19. I have been holding off doing anything about it until the situation permits.
20. I have been trying to get emotional support from friends or relatives.
21. I have been just giving up trying to reach my goal.
22. I have been taking additional action to try to get rid of the problem.
23. I have been refusing to believe that it has happened.
24. I have been letting my feelings out.
25. I have been trying to see it in a different light, to make it seem more positive.
26. I have been talking to someone who could do something concrete about the problem.
27. I have been sleeping more than usual.
28. I have been trying to come up with a strategy about what to do.
29. I have been focusing on dealing with this problem, and if necessary let other things slide a little.
30. I have been getting sympathy and understanding from someone.
31. I have been drinking alcohol or taking drugs, in order to think about it less.
32. I have been giving up the attempt to get what I want.
33. I have been looking for something good in what has been happening.
34. I have been thinking about how I might best handle the problem.
35. I have been pretending that it hasn't really happened.
36. I have been making sure not to make matters worse by acting too soon.
37. I have been trying hard to prevent other things from interfering with my efforts at dealing with this.
38. I have been going to the cinema or watching TV, to think about it less.
39. I have been accepting the reality of the fact that it happened.
40. I have been asking people who have had similar experience what they did.
41. I have been feeling a lot of emotional distress and finding myself expressing those feelings a lot.
42. I have been taking direct action to get around the problem.
43. I have been trying to find comfort in my religion.
44. I have been forcing myself to wait for the right time to do something.
45. I have been reducing the amount of effort I'm putting into solving the problem.
46. I have been talking to someone about how I have been feeling.
47. I have been learning to live with it.
48. I have been putting aside other activities in order to concentrate on this.
49. I have been thinking hard about what steps to take.
50. I have been acting as though it hasn't happened.
51. I have been doing what has to be done, one step at a time.
52. I have been learning something from the experience.
53. I have been praying more than usual.
COPE Scale

1 = I have not been doing this at all.

2 = I have been doing this a little bit.

3 = I have been doing this a medium amount.

4 = I have been doing this a lot.
Appendix 11.

Name: ____________________________  ID: ____________________________  Date: ____________________________

Questions immediately after completion of COPE

1. How would you describe the occurrence of your hand injury/onset of your hand condition? Please circle your answer ((a), (b), or (c)). If more than one of (a), (b) or (c) applies, then please think of the most important factor:
   (a) As a threat or danger or a source of worry as to how things would turn out?
   (b) As loss of or harm to something of value to you?
   or
   (c) As a challenge or opportunity?

Comments: ____________________________

------------------------------------------------------------------------------------------------------------------

2. Please place a short vertical mark anywhere along the horizontal line shown below to indicate how well you feel you are generally coping with your hand injury/hand condition, from "I am not coping at all" to "I am coping extremely well".

I am not coping at all ____________________________ I am coping extremely well

Comments: ____________________________

------------------------------------------------------------------------------------------------------------------

3. What methods of coping with your hand injury/hand condition do you feel have been the most helpful for you? (for example, seeking advice from others, taking up a new activity, trying to think positively). Please list in order of importance.

1. ____________________________
2. ____________________________
3. ____________________________
4. What methods of coping with your hand injury/hand condition do you feel have been the least helpful for you? Again, please list in order of importance.

1. ___________________________________________________________

2. ___________________________________________________________

3. ___________________________________________________________

Comments:

____________________________________________________________
Appendix 12.

Second interview

Name: __________________________ I.D: __________ Date: __________

"Have you been suffering from any other medical conditions since your last interview?" (list)

__________________________________________________________________________

__________________________________________________________________________

"Have there been any changes to the medication you have been taking since your last interview?" (list)

__________________________________________________________________________

__________________________________________________________________________

"Have you had any further operations / stays in hospital since your last interview?" (list reasons)

__________________________________________________________________________

__________________________________________________________________________

"Have you been through any further stressful life events since your last interview (for example, divorce, separation, job change/loss, loss of social contacts, financial or legal difficulties)?" (underline if relevant)

__________________________________________________________________________

Please read each of the following statements (from 1 to 53) and indicate, by ticking the box on the response sheet underneath the number of the most appropriate answer (1 = I have not been doing this at all; 2 = I have been doing this a little bit; 3 = I have been doing this a medium amount or 4 = I have been doing this a lot) to describe to what extent you have used each statement to recently deal with the reaction to your hand. There are no "right" or "wrong" answers, so please choose the most accurate answer for YOU - - not what you think "most people" would say or do. Indicate what YOU have been doing recently to deal with the reaction to your hand."

List of statements.

1. I have been trying to grow as a person as a result of the experience.
2. I have been turning to work or other substitute activities to take my mind off things.
3. I have been getting upset and letting my emotions out.
4. I have been trying to get advice from someone about what to do.
5. I have been concentrating my efforts on doing something about it.
6. I have been saying to myself "this isn't real."
7. I have been putting my trust in God.
8. I have been admitting to myself that I can't deal with it, and quit trying.
9. I have been restraining myself from doing anything too quickly.
10. I have been discussing my feelings with someone.
11. I have been getting used to the idea that it happened.
12. I have been talking to someone to find out more about the situation.
13. I have been keeping myself from getting distracted by other thoughts or activities.
14. I have been daydreaming about things other than this.
15. I have been getting upset, and am really aware of it.
16. I have been seeking God's help.
17. I have been making a plan of action.
18. I have been accepting that this has happened and that it can't be changed.
19. I have been holding off doing anything about it until the situation permits.
20. I have been trying to get emotional support from friends or relatives.
21. I have been just giving up trying to reach my goal.
22. I have been taking additional action to try to get rid of the problem.
23. I have been refusing to believe that it has happened.
24. I have been letting my feelings out.
25. I have been trying to see it in a different light, to make it seem more positive.
26. I have been talking to someone who could do something concrete about the problem.
27. I have been sleeping more than usual.
28. I have been trying to come up with a strategy about what to do.
29. I have been focusing on dealing with this problem, and if necessary let other things slide a little.
30. I have been getting sympathy and understanding from someone.
31. I have been drinking alcohol or taking drugs, in order to think about it less.
32. I have been giving up the attempt to get what I want.
33. I have been looking for something good in what has been happening.
34. I have been thinking about how I might best handle the problem.
35. I have been pretending that it hasn't really happened.
36. I have been making sure not to make matters worse by acting too soon.
37. I have been trying hard to prevent other things from interfering with my efforts at dealing with this.
38. I have been going to the cinema or watching TV, to think about it less.
39. I have been accepting the reality of the fact that it happened.
40. I have been asking people who have had similar experience what they did.
41. I have been feeling a lot of emotional distress and finding myself expressing those feelings a lot.
42. I have been taking direct action to get around the problem.
43. I have been trying to find comfort in my religion.
44. I have been forcing myself to wait for the right time to do something.
45. I have been reducing the amount of effort I'm putting into solving the problem.
46. I have been talking to someone about how I have been feeling.
47. I have been learning to live with it.
48. I have been putting aside other activities in order to concentrate on this.
49. I have been thinking hard about what steps to take.
50. I have been acting as though it hasn't happened.
51. I have been doing what has to be done, one step at a time.
52. I have been learning something from the experience.
53. I have been praying more than usual.
Appendix 14
COPE scales showing items in trait format Carver et al., (1989).

P = Problem-focused coping     E = Emotion-focused coping

1. Active coping (taking action, exerting efforts, to remove or circumvent the stressor) = P.
I have been concentrating my efforts on doing something about it.
I have been taking additional action to try to get rid of the problem.
I have been taking direct action to get around the problem.
I have been doing what has to be done, one step at a time.

2. Planning (thinking about how to confront the stressor, planning one's active coping efforts) = P.
I have been making a plan of action.
I have been trying to come up with a strategy about what to do.
I have been thinking about how I might best handle the problem.
I have been thinking hard about what steps to take.

3. Seeking instrumental social support (seeking assistance, information, or advice about what to do) = P.
I have been trying to get advice from someone about what to do.
I have been talking to someone to find out more about the situation.
I have been talking to someone who could do something concrete about the problem.
I have been asking people who have had similar experience what they did.

4. Seeking emotional social support (getting sympathy or emotional support from someone) = E, but could be adaptive.
I have been discussing my feelings with someone.
I have been trying to get emotional support from friends or relatives.
I have been getting sympathy and understanding from someone.
I have been talking to someone about how I have been feeling.

5. Suppression of competing activities (suppressing one's attention to other activities in which one might engage, in order to concentrate more completely on dealing with the stressor) = P.
I have been keeping myself from getting distracted by other thoughts or activities.
I have been focusing on dealing with this problem, and if necessary let other things slide a little.
5. **Suppression of competing activities** (cont.).
I have been trying hard to prevent other things from interfering with my efforts at dealing with this.
I have been putting aside other activities in order to concentrate on this.

6. **Religion** (increased engagement in religious activities) = E, but could be adaptive.
   I have been putting my trust in God.
   I have been seeking God's help.
   I have been trying to find comfort in my religion.
   I have been praying more than usual.

7. **Positive reinterpretation and growth** (making the best of the situation by growing from it, or viewing it in a more favorable light) = E, but could be adaptive.
   I have been trying to grow as a person as a result of the experience.
   I have been trying to see it in a different light, to make it seem more positive.
   I have been looking for something good in what has been happening.
   I have been learning something from the experience.

8. **Restraint coping** (coping passively by holding back one's coping attempts until they can be of use) = P.
   I have been restraining myself from doing anything too quickly.
   I have been holding off doing anything about it until the situation permits.
   I have been making sure not to make matters worse by acting too soon.
   I have been forcing myself to wait for the right time to do something.

9. **Acceptance** (accepting the fact that the stressful event has occurred and is real) = E.
   I have been getting used to the idea that it happened.
   I have been accepting that this has happened and that it can't be changed.
   I have been accepting the reality of the fact that it happened.
   I have been learning to live with it.

10. **Focus on and venting of emotions** (an increased awareness of one's emotional distress, and a concomitant tendency to ventilate or discharge those feelings) = E.
    I have been getting upset and letting my emotions out.
    I have been getting upset, and am really aware of it.
    I have been letting my feelings out.
10. **Focus on and venting of emotions (cont.).**
I have been feeling a lot of emotional distress and finding myself expressing those feelings a lot.

11. **Denial** (an attempt to reject the reality of the stressful event) = E.
I have been saying to myself "this isn't real."
I have been refusing to believe that it has happened.
I have been pretending that it hasn't really happened.
I have been acting as though it hasn't happened.

12. **Mental disengagement** (psychological disengagement from the goal with which the stressor is interfering, through daydreaming, sleep, or self-distraction) = E.
I have been turning to work or other substitute activities to take my mind off things.
I have been daydreaming about things other than this.
I have been sleeping more than usual.
I have been going to the cinema or watching TV, to think about it less.

13. **Behavioural disengagement** (giving up, or withdrawing effort from, the attempt to attain the goal with which the stressor is interfering) = E.
I have been admitting to myself that I can't deal with it, and quit trying.
I have been just giving up trying to reach my goal.
I have been giving up the attempt to get what I want.
I have been reducing the amount of effort I'm putting into solving the problem.

14. **Alcohol/drug use** (turning to the use of alcohol or other drugs as a way of disengaging from the stressor) = E.
31. I have been drinking alcohol or taking drugs, in order to think about it less.
Appendix 15: Table 1 (a)

Correlations between emotion-focused coping scores at time 1 and scores on measures of psychological distress at time 2, versus correlations between problem-focused coping scores at time 1 and these same scores at time 2 in comparison group

<table>
<thead>
<tr>
<th></th>
<th>Emotion-focused coping (time 1)</th>
<th>Problem-focused coping (time 1)</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>( r )</td>
<td>( r )</td>
<td>Fisher's z</td>
</tr>
<tr>
<td>Total PTSD-I</td>
<td>-.10 n.s.</td>
<td>.11 n.s.</td>
<td>0.05 n.s.</td>
</tr>
<tr>
<td>IES intrusion</td>
<td>.06 n.s.</td>
<td>.09 n.s.</td>
<td>-0.07 n.s.</td>
</tr>
<tr>
<td>IES avoidance</td>
<td>.04 n.s.</td>
<td>.18 n.s.</td>
<td>0.38 n.s.</td>
</tr>
<tr>
<td>HAD anxiety</td>
<td>-.09 n.s.</td>
<td>-.03 n.s.</td>
<td>0.16 n.s.</td>
</tr>
<tr>
<td>HAD depression</td>
<td>-.09 n.s.</td>
<td>.04 n.s.</td>
<td>0.13 n.s.</td>
</tr>
<tr>
<td>Positive affect</td>
<td>.30 n.s.</td>
<td>.09 n.s.</td>
<td>0.55 n.s.</td>
</tr>
<tr>
<td>Negative affect</td>
<td>-.08 n.s.</td>
<td>-.008 n.s.</td>
<td>0.19 n.s.</td>
</tr>
</tbody>
</table>

Table 1 (b) Correlations between measures of psychological distress at time 1 and emotion- and problem-focused coping at time 2

<table>
<thead>
<tr>
<th></th>
<th>Emotion-focused coping (time 2)</th>
<th>Problem-focused coping (time 2)</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>( r )</td>
<td>( r )</td>
<td>Fisher's z</td>
</tr>
<tr>
<td>Total PTSD-I</td>
<td>.41 n.s.</td>
<td>.21 n.s.</td>
<td>0.59 n.s.</td>
</tr>
<tr>
<td>IES intrusion</td>
<td>.18 n.s.</td>
<td>.18 n.s.</td>
<td>0.0 n.s.</td>
</tr>
<tr>
<td>IES avoidance</td>
<td>.12 n.s.</td>
<td>.12 n.s.</td>
<td>0.0 n.s.</td>
</tr>
<tr>
<td>HAD anxiety</td>
<td>.31 n.s.</td>
<td>.19 n.s.</td>
<td>0.34 n.s.</td>
</tr>
<tr>
<td>HAD depression</td>
<td>.29 n.s.</td>
<td>.39 n.s.</td>
<td>0.30 n.s.</td>
</tr>
<tr>
<td>Positive affect</td>
<td>.08 n.s.</td>
<td>-.02 n.s.</td>
<td>0.16 n.s.</td>
</tr>
<tr>
<td>Negative affect</td>
<td>.19 n.s.</td>
<td>.12 n.s.</td>
<td>0.19 n.s.</td>
</tr>
</tbody>
</table>
## Appendix 16: Table 2

### Most helpful and least helpful ways of coping reported by hand injury (HI) and hand comparison (HC) groups

<table>
<thead>
<tr>
<th>Time 1</th>
<th>HI</th>
<th>HC</th>
<th>Time 2</th>
<th>HI</th>
<th>HC</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Most helpful ways of coping</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Support from or talking to family/friends</td>
<td>10</td>
<td>2</td>
<td>5</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Trying to think positively / looking on the positive side</td>
<td>4</td>
<td>3</td>
<td>8</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Thinking &quot;there's no point in worrying&quot;</td>
<td>3</td>
<td>2</td>
<td>0</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Holding a determined approach (e.g. &quot;I've got to go for it,&quot; &quot;Things won't beat me&quot;)</td>
<td>0</td>
<td>3</td>
<td>1</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Physiotherapy advice and exercises</td>
<td>3</td>
<td>3</td>
<td>4</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Keeping busy, returning to work and resuming a normal life</td>
<td>2</td>
<td>1</td>
<td>3</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Taking up a new activity</td>
<td>0</td>
<td>1</td>
<td>3</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Support from staff</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Having confidence in the surgeon/</td>
<td>2</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Frenchay Hospital</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aim to come to terms with the situation and lead a normal life</td>
<td>2</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Adopt a pragmatic approach</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Think of others worse off than myself</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Talking to people who have had a similar experience</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Knowing that I will be able to resume previous activities/skills e.g. cycling, writing, use computer</td>
<td>2</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Realizing that there is more to life than work</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Activity</td>
<td>Time 1</td>
<td>Time 2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-------------------------------------------------------------------------</td>
<td>--------</td>
<td>--------</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Think about other people more to help me to become a better person</td>
<td>1</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Planning ahead to make positive changes (e.g. regarding job)</td>
<td>0</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Having a sense of humour</td>
<td>0</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hold a fatalistic approach (&quot;I just do what I think may help&quot;)</td>
<td>0</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Act on advice given and just carry it out</td>
<td>0</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trust in God</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adapt to playing music in a different way</td>
<td>0</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Try to forget about it</td>
<td>0</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Drink alcohol to forget about it</td>
<td>0</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Try to make a joke about it</td>
<td>0</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Take sensible precautions (e.g. try to avoid getting hit by football)</td>
<td>0</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Keep hand in pocket, so out of view</td>
<td>1</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ask someone to cut up my food</td>
<td>1</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Telling my story to the press</td>
<td>1</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Look at opposite hand which has been successfully treated</td>
<td>0</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Being made to look at injured hand when I could not look it</td>
<td>1</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
2. **Least helpful ways of coping**

<table>
<thead>
<tr>
<th></th>
<th>Time 1 HI</th>
<th>Time 1 HC</th>
<th>Time 2 HI</th>
<th>Time 2 HC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meeting new people and being asked repetitive questions</td>
<td>4</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>People being sarcastic or making jokes about my hand</td>
<td>0</td>
<td>1</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>Embarrassment in talking to friends (although talking also helps)</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Embarrassment in other people who recoil from my hand</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Lack of support from relatives</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Lack of financial help</td>
<td>1</td>
<td>0</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Seeing the machine that caused the injury</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Feeling disappointed after visiting artificial limb centre</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Not having someone explain the negative consequences of holding my emotions in</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Not seeing a Clinical Psychologist prior to six days after the injury (because I initially blamed myself)</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Not having follow-up care from Social Worker</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Worrying about what happened</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Being left in hospital and not being told what was going to happen</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Relatives telling me about other people worse off than myself</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Being charged too much money by</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Disability services for appropriate aids</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
2. Least helpful ways of coping (cont.)

<table>
<thead>
<tr>
<th></th>
<th>Time 1</th>
<th></th>
<th>Time 2</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>HI</td>
<td>HC</td>
<td>HI</td>
<td>HC</td>
</tr>
<tr>
<td>Fear of hospitals and needles</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Self-consciousness in shaking hands with people and trying to use hands with fingers bent</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Getting depressed due to inability to use hands to the same extent</td>
<td>0</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Not voicing my concerns and waiting for others to take action</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Not receiving enough reassurance from experts</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Not being allowed enough independence from family</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Becoming too physically tired during physiotherapy exercises</td>
<td>0</td>
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References


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