The Structure of Avoidance Following Trauma:

Development and Validation of the Posttraumatic Avoidance Scale

(PAS)

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Running head: Structure of avoidance following trauma

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Abstract

Avoidance is a key maintenance factor in traumatic reactions but currently no satisfactory measures of it exist. Previous factor analytic studies have demonstrated a distinction between conscious attempts to avoid trauma-related stimuli (e.g. trying not to talk or think about the event) versus non-conscious avoidance processes (e.g. emotional numbing, amnesia). Here we develop and validate a multi-dimensional measure of trauma-related avoidance across two samples. In sample 1, 485 emergency service personnel completed a 44-item self-report measure of avoidance in relation to an identified occupational trauma. Principal components analysis provided evidence for a distinction between controlled and automatic avoidance. On the basis of these results a 20-item measure, the Posttraumatic Avoidance Scale (PAS), was constructed. The predictive validity of the PAS was established in a longitudinal study utilizing six month follow up data from the emergency service personnel sample. Test re-test reliability was found to be very good for this six month period (correlations > .70) for both PAS controlled and automatic avoidance subscales. Sample 2 illustrated the transdiagnostic potential of the PAS in an eating disordered sample, all of whom reported to have experienced at least one traumatic event. Support was found for the two factor structure of the PAS as well as for the convergent validity within this sample. The internal consistency of the PAS was assessed within both samples (Cronbach's alphas > .80) for both controlled and automatic avoidance subscales. This measure of trauma-related avoidance is the first to intentionally assess trauma-related avoidance symptoms in this bi-dimensional manner.

KEY WORDS: PTSD, avoidance, inhibition, assessment.

Survivors of psychological trauma draw on a number of avoidance mechanisms to protect themselves from memories and reminders of the traumatic event and the often intense associated emotions. Theoretical work by Dalgleish, Mathews and Wood (1999) proposed a multidimensional conceptualization of avoidance that emphasized two important distinctions (see also, Dalgleish & Power, 2004). The first distinction, following Shiffrin and Schneider (1977), was between automatic and controlled avoidance. Distinguishing automatic and controlled processes has proved useful in cognitive psychology when referring respectively to rapid, parallel, non-conscious, resource-independent, processing on the one hand and slower, serial, conscious, resource-dependent processing on the other. According to Dalgleish et al (1999) an example of automatic avoidance following trauma would be psychogenic amnesia - the involuntary inability to remember details about the traumatic event that is a symptom of PTSD. In contrast, an example of controlled avoidance would be the PTSD symptom involving deliberate attempts to avoid thinking about the traumatic event.

In support, Foa, Riggs and Gershuny (1995) report that the avoidance symptoms for PTSD split into numbing symptoms and a separate factor of effortful avoidance symptoms. Subsequently, there have been a number of studies that have applied confirmatory factor analysis to the symptom structure of PTSD that have reported effortful avoidance and numbing symptoms of PTSD as distinct constructs (e.g., Andrews, Joseph, Shevlin & Troop, 2006; Asmundson, Frombach, McQuaid, Pedrelli, Lenox, & Stein, 2000; Cordova, Studts, Hann, Jacobsen, & Andrykowski, 2000).The second distinction Dalgleish et al (1999) made was between avoidance of emotion-related information and avoidance of emotional feelings. Applying this to the trauma domain individuals may avoid emotion-related information about the trauma by trying not to talk about it or think about it, or perhaps through amnesia for details of the event. Alternatively, individuals may avoid

emotional feelings by trying not to get upset, by bottling up their feelings, or simply through being unable to experience emotion - emotional numbing.

Dalgleish et al (1999) proposed a four-fold conceptualization of avoidance that can be applied to the trauma domain: automatic avoidance of emotion-related information (e.g., psychogenic amnesia); automatic avoidance of emotional feeling (e.g., emotional numbing); controlled avoidance of emotion-related information (e.g., avoidance of reminders of the event); and, controlled avoidance of emotional feeling (e.g., refusing to discuss feelings surrounding the event). There have, however, been no attempts to examine the four fold structure of avoidance and defensive reactions following trauma. A scale that can assess both controlled and automatic avoidance would be useful to researchers and clinicians interested in the avoidance mechanisms and how they relate to psychological outcomes and intervention. Due to the preference by many therapists to use formulation techniques when working with clients it is becoming increasingly important to understand the constellation of PTSD symptoms in order to make most effective use of the appropriate treatments rather than just assessing clients for a diagnosis of PTSD. The more information a therapist can gain in relation to the type of avoidance symptoms/strategies employed by the client the more appropriate the choice of treatments will be. For example, Taylor et al (2003) compared the effectiveness of three treatment types (relaxation, EMDR and exposure) and found that exposure was more effective in reducing arousal and avoidance symptoms but it was no better than the other two treatments in reducing numbing symptoms. Asmundson, Stapelton and Taylor (2004) suggest that exposure should be used as the treatment for avoidance symptoms but where numbing is the primary concern cognitive restructuring targeting negative thinking may be more effective. These two studies indicate that an assessment tool that delineates the types of avoidance symptoms would greatly assist in identifying the most appropriate intervention.

The aim of this study was therefore to develop a multidimensional measure of avoidance using the Dalgleish et al (1999) four-fold conceptualization as a guide for item generation. The psychometric properties of the new measure would then be explored within two very different samples of people who had experienced traumatic events. In particular the structure of the measure will be examined to determine whether Dalgleish et al's (1999) four-factor conceptualization is reflected in this self-report questionnaire. Finally convergent and predictive validity will be reported alongside internal and test re-test reliability of the measure.

Method

Participants

Sample 1: Emergency Services sample. Four hundred and ninety four emergency service personnel were recruited from five emergency service departments in the South of England, all of whom reported being exposed to at least one traumatic event between 1971 and 2000 (mean time elapsing since the identified trauma was 78 months [$SD = 74$]). All participating departments retained control over the methods of recruitment and distribution of the questionnaires. Four of the five participating departments randomly allocated the questionnaire packs to staff pigeon holes, whereas one department sent out an invitation to all staff inviting them to forward their name and base to the personnel department if they wanted to participate or receive further information regarding the study. In total 2200 questionnaires were distributed within the participating emergency service departments and 494 were returned (response rate of 22.50%).

The invitations to participate offered two options: i) to agree to take part in a cross-sectional study only, or ii) to take part in a longitudinal study with permission to contact the participant after a 6 month interval. Participants who chose the first option returned

completely anonymous questionnaires whereas participants who chose the second option completed an attached contact details form and returned these with the completed questionnaires. Of the 494 emergency service personnel, 255 agreed to participate in the longitudinal study and 239 agreed to take part in the cross-sectional study only. The cross-sectional data and the data from the first time point of the longitudinal study were combined in order to provide a large sample of emergency service personnel for an exploratory principal components analysis. In order to ensure there were no significant differences in the way police, fire, ambulance and coastguards responded to the reported traumatic events and to allow us to combine them into one sample we carried out one way ANOVAs using the measures described below as dependent variables (see Measures section). None of the ANOVAs were statistically significant therefore we can be confident that the sample can be combined into one emergency service personnel sample (largest $F_{(3, 477)} = 1.441$, p = .230 with PSS arousal subscale as dependent variable).

Of the 255 participants who agreed to take part in the longitudinal study, 129 completed the six month follow-up measures (a 52.55% response rate). We examined whether there were any differences in participants who did or did not complete the Time 2 assessment. There were no significant differences on any of the distress or avoidance measures. However, completers were significantly older , $t_{(253)} = 3.36$, $p < 0.001$, had spent more years in the service, $t_{(254)} = 2.98$, $p < 0.01$, and their specified trauma was further in the past, $t_{(224)} = 2.36$, $p < 0.05$, than those who completed Time 1 only. The sample consisted of 246 police officers, 215 members of the fire brigade, 29 members of the ambulance service and four coastguards. Ages for the entire sample ranged from 18 to 58 years ($M = 38.03$ years, $SD = 8.21$). There were 73 females (14.85%) and 421 males (85.15%). Length of service ranged from nine months to 40 years ($M = 14.05$ years, $SD = 8.12$). The education levels of the sample were: 290 (59.06%) were educated to secondary

school level, 147 (29.94%) attended further education, and 54 (11.00%) attended higher education. The ranks for the police (according to UK ranking systems) ranged from Constable up to Superintendent; for the fire service from Firefighter up to Assistant Divisional Officer; for the ambulance service from Ambulance Technician up to Assistant Divisional Commander, and for the coastguards from Auxiliary Coastguard up to Station Officer.

In order to ensure that all the emergency service personnel had experienced or witnessed an objectively traumatic event, participants were first asked a four-clause question based on the DSM-IV Criterion A for the diagnosis of PTSD (American Psychiatric Association, 1994). Respondents were asked to state: (1) whether or not they had, as part of their work in the emergency services, ever attended an incident in which they had been injured or (2) come close to being killed, or (3) whether they had witnessed another person being injured or (4) having been killed. Respondents were then asked to think about the incidents they had attended and to choose the one incident which, if they were to describe it to another person, would be considered by that person as the "most traumatic" even if they themselves did not think so. This instruction was chosen because certain types of avoidance such as emotional numbing might be expected to interfere with subjective judgments of the traumatic nature of the experienced events. The study was approved by the University of Essex Ethics Committee.

Sample 2: Eating Disordered sample: Evidence suggests that a large percentage of eating disordered patients experience severe life events before the onset of their eating disorder (e.g. Welch, Doll & Fairburn, 1997). Indeed, there is a higher rate of PTSD symptoms and diagnosis in eating disordered patients than would be expected in the community (Turnbull, Troop & Treasure, 1997). Moreover, eating disordered patients report difficulty in coping with these adverse experiences (Troop, Holbrey & Treasure,

1998) and often describe extensive use of avoidant strategies. In addition, Schmidt & Treasure (2006) point to the role of avoidance in the maintenance of anorexia within their cognitive-interpersonal model. One aspect that is described within this model is experiential avoidance (Hayes, Wilson, Gifford, Follette & Strosahl, 1996). Experiential avoidance is described as the steps a person will take to alter the form or frequency of events that elicit specific private experiences such as emotions, bodily sensations, thoughts, memories etc. Experiential avoidance is thought to occur when a person doesn't want to remain in contact with these private experiences.

Individuals were recruited with a probable or possible diagnosis of an eating disorder, via an eating disorder research volunteer register held at the Section on Eating Disorders at the Institute of Psychiatry. This register was built up through advertisements in Signpost (the magazine of the former Eating Disorders Association in the U.K., now called b-eat), requests in newspaper and magazine articles (following interviews/articles by members of the unit on issues concerned with eating disorders), invitations to participants taking part in other research on eating disorders, and recruitment of eating disorder patients attending for treatment at the Maudsley and Bethlem Trust, London, U.K. All 366 participants on the register at the time of the study were invited to take part, of whom 129 (35%) indicated that they had experienced a trauma and were willing to take part (125 female, 4 male). These volunteers were at varying stages of an eating disorder, including patients in hospital, sufferers not currently receiving treatment, and individuals who were recovering or had recovered from an eating disorder. Although essentially self-diagnosed, 88% had received treatment at some time for their eating disorder.

To tentatively confirm diagnosis, a modified version of the Short Evaluation for Eating Disorders (SEED: see Bauer, Winn, Schmidt & Kordy, 2005) was administered. This measures the main behavioural (e.g. presence and frequency of binge eating,

vomiting, dieting/fasting) and cognitive/affective symptoms (e.g. fear of weight gain)

symptoms of eating disorders. The modifications made in the present study included the

addition of a precise definition of "binge eating" according to the DSM-IV (APA, 1994) as

well as more specifically measuring the duration of specific symptoms. This was to ensure

that symptoms of binge eating and vomiting had been present for at least three months as

specified by the DSM-IV (APA, 1994). Seven participants were excluded on the basis of

this (5 reporting never having binged, purged or lost sufficient weight to meet criteria; 2

providing insufficient information to make this decision), leaving a final sample size of

122 (118 females and 4 males). The mean age of the sample was 34.8 ($SD = 11.1$) years.

The marital status of the sample was as follows: 65 single; 5 cohabiting; 22 married; 19

divorced; 1 widowed and 10 missing data. The study was approved by the ethical

committee at the Maudsley and Bethlem Trust.

Measures

Posttraumatic Avoidance Scale - Item Generation.

Participants were asked to complete 44 test items (see Table 1) in relation to the

identified event. The intent in scale construction was to generate items assessing the four

constructs already discussed: automatic avoidance of emotional feelings, automatic

avoidance of emotion-related information, controlled avoidance of emotional feelings,

controlled avoidance of emotion-related information (Dalgleish et al., 1999). Published

(e.g. Horowitz, Wilner & Alvarez, 1979) and author-constructed items were included. The

author-constructed items were generated on the basis of clinical interviews (conducted by

TD) of over 100 trauma survivors in which detailed questions about the nature of their

avoidance symptomatology was a focus. The initial items were then independently

classified by TD and SJ with respect to the four constructs of: controlled avoidance of

emotion-related information; controlled avoidance of emotional feelings; automatic avoidance of emotion-related information; and automatic avoidance of emotional feelings. Only items for which there was unanimous agreement were included in the item list presented to participants in sample 1.

The four a priori item groupings were consequently: automatic avoidance of emotion-related information (items 1, 5, 9, 13, 17, 21, 25, 29, 33, 37, and 41), automatic avoidance of emotional feeling (items 2, 6, 10, 14, 18, 22, 26, 30, 34, 38, and 42), controlled avoidance of emotion-related information (items 3, 7, 11, 15, 19, 23, 27, 31, 35, 39, and 43), and controlled avoidance of emotional feeling (items 4, 8, 12, 16, 20, 24, 28, 32, 36, 40, and 44). Each item was rated by respondents on a 5-point scale, never = 0, rarely = 1, sometimes = 2, often = 3, and always = 4. In order to obviate response bias, a number of the avoidance items were reverse-worded and were therefore, de facto, 'approach' items. For example, item 11: "Are you happy to go over what happened with other people?" was intended as a reverse-worded item tapping controlled avoidance of emotion-related information. Such reversal of item wording rested on the assumption that avoidance and approach are two sides of the same coin.

Measures of Posttraumatic Distress.

In order to assess the range and level of post-traumatic stress symptoms and subjective distress, respondents also completed the PTSD Symptomatology Scale (PSS: Foa, Riggs, Dancu & Rothbaum, 1993) [sample 1] or the Posttraumatic Diagnostic Scale (PDS: Foa, 1995) [sample 2] and the Impact of Event Scale (IES: Horowitz et al., 1979).

The PSS is a 17-item self-report measure that yields scores for intrusive, avoidant, and arousal symptoms experienced over the previous two weeks. Each item is rated on a 4-point scale, ranging from 0 (symptom not experienced at all) to 3 (symptom experienced

almost always). Although the PSS was originally designed in-line with the diagnostic criteria for PTSD as described in DSM-III-R (APA, 1987) it can also be scored according to the DSM-IV diagnostic criteria by removing item 17 from the arousal subscale and including it in the intrusion subscale. For this study all subscale scores were calculated in-line with the DSM-IV criteria. The present study reported satisfactory Cronbach's alphas for each of the PSS subscales in sample 1 at .81, .83, and .85, respectively.

The PDS is a 49 item self-report measure, which can be used to provide a diagnosis of PTSD in line with DSM-IV requirements. It consists of questions about the currently most distressing situation (Criterion A); the 17 PTSD symptoms, scored on a 4-point scale (Criteria B, C, and D); questions regarding the duration of symptoms (Criterion E); and questions relating to impairment in other areas of life (Criterion F). As well as a diagnostic tool, the PDS can also be used to provide symptom severity scores for the three PTSD symptom clusters. Cronbach's alphas for the three subscale scores of re-experiencing, avoidance and arousal in sample 2 were 0.90, 0.86, and 0.74, respectively.

The IES is a 15-item self-report scale that yields scores for current intrusive and avoidant symptoms. Respondents are asked to rate how true certain statements are on a 4-point scale of 0 = "not at all", 1 = "rarely", 3 = "sometimes" and 5 = "often" with regard to a specific life event, taking the past seven days into account. Cronbach's alphas for the intrusion and avoidance subscales were found to be satisfactory in sample 1 at .90 and .84 respectively.

Results

Nine of the 494 respondents in sample 1 did not endorse the question designed to assess whether they had experienced an incident that would meet DSM-IV Criterion A1 for PTSD. These respondents were therefore excluded from the analysis as we were

specifically interested in the avoidance strategies of individuals who had experienced

traumatic events as defined in Criterion A1 for PTSD of the DSM-IV. This left 485

respondents who satisfied DSM-IV Criterion A1 for PTSD.

Structural Analysis.

An exploratory principal components analysis was conducted on all 44-avoidance

items using all Time 1 data from sample 1. This analysis yielded nine factors with

eigenvalues greater than one (10.07, 3.61, 3.13, 2.11, 1.54, 1.35, 1.22, 1.20, and 1.06,

respectively) and accounted for 57% of the variance. Inspection of the scree plot indicated

a natural break between the third and fourth factors and on this basis it seemed appropriate

to conduct a forced three-factor analysis. As this was an exploratory study both varimax

and oblique rotations were carried out as there was no way of knowing whether the factors

extracted were correlated with each other or not. Tabachnick and Fidell (2001) suggest a

correlation of .32 or greater among factors in order to justify using an oblique rotation.

Following an oblique rotation, the component correlation matrix yielded a correlation

between Factor 1 and Factor 2 of .32, but nearly zero order correlations between Factor 1

and Factor 3 (r = .041) and Factor 2 and Factor 3 (r = -.068). Since only one correlation

was found, we therefore moved to a varimax rotation with three factors specified for

extraction (using a loading criterion of .50). To ensure a simple structure, an item was only

retained if the difference between its loading on the principal factor and its loading on any

other factor was .25 or greater. Items that fulfilled these criteria are shown in Table 1,

along with the means and standard deviations for each item.

Sixteen items that fulfilled the above criteria loaded on Factor 1, eight of which fell

within our original a priori category of controlled avoidance of emotion-related

information (items 3, 7, 15, 19, 23, 27, 31, and 43), and five of which fell within our

category of controlled avoidance of emotional feeling (items 4, 8, 16, 24, and 32). This suggested that Factor 1 was a general controlled avoidance construct. However, three of the items that loaded on Factor 1 were originally included within our category of automatic avoidance of emotional feeling (items 6, 18, and 38). Inspection of these items revealed that they were all reverse-worded items. For example, "Are your memories of the event accompanied by lots of emotion?" In our a priori item categorization, these items only made sense as reverse-worded measures of emotional feeling if the automatic avoidance and the automatic experience of emotion are two sides of the same coin. However, the results did not appear to support this view. Instead, it appears that the three items about emotional experience have loaded with the controlled avoidance items. One explanation for this is it is usually only those people who experience (uncontrollable) distress that feel the need to avoid. So if for example individuals get upset when talking about the event, or their memories of the event elicit a lot of emotion, they are more likely to avoid talking about the event or being reminded of the event. However, as we wanted a measure of controlled avoidance that was represented by each and every item we decided to discard these items on the basis of face validity.

On reflection we also noted that three of the items that were originally in our a priori category of controlled avoidance and loaded on this factor also did not fulfil the criterion for face validity. These items (8, 16, and 24) appear to be a measure of attitude towards emotional expression, rather than controlled avoidance for example, item 8 "Do you think you are a weak person if you get upset when you remember the event?" Whilst this item is associated with avoidance in that those individuals who think they are weak if they get upset about the event are more likely to avoid stimuli that elicit memories of the event, it is not a measure of avoidance in its own right. To this end, we chose to discard

three more items on the basis of face validity. This resulted in a 10 item factor that was labeled as controlled avoidance.

Ten items loaded on Factor 2, six of which were in our a priori category of automatic avoidance of emotion-related information (items 9, 13, 17, 21, 25, and 41) and four of which were subsumed under automatic avoidance of emotional feelings (items 10, 14, 26, and 42). None of these items was reverse-worded. It would appear that this factor is best characterized as a measure of automatic avoidance.

Finally, six items loaded on Factor 3, four of which were in our original category of controlled avoidance of emotional feeling (items 12, 28, 36, and 40) and two of which were subsumed under controlled avoidance of emotion-related information (items 11 and 39). However, interestingly it was only reverse-worded items that loaded on this factor (e.g. "Do you make sure you let others see how you feel about the event?"), all of which, at face value, measured approach or expression. These results suggest that avoidance and approach might actually be separable factors. The items that loaded on this approach factor all involved some level of intent, therefore we chose to characterize this factor as controlled approach. As our explicit intention was to develop a multidimensional measure of posttraumatic *avoidance* we decided at this stage to drop the third factor of 'effortful approach' from the measure. There are already many valid and reliable measures of coping which include subscales concerned with the venting and expression of emotions and the seeking of social support (e.g., Carver, Scheier, & Weintraub, 1989). Dropping the approach subscale resulted in a 20 item two-factor measure of controlled and automatic avoidance.

To further test the structure of the two factor measure another exploratory Principal Components Analysis was conducted on the retained 20 items using data from sample 2. Four eigenvalues greater than one were identified (6.84, 3.56, 1.41, & 1.13), which

accounted for 64.7% of the total variance. However, inspection of the scree plot suggested a two factor solution. The two factors accounted for 52% of the total variance. The rotated component matrix in Table 2 displays the loadings for each item on its respective factor. There were no cross-loadings.

<p style="text-align:center">-insert Tables 1 and 2 about here-</p>

Two of the automatic avoidance items just failed to reach the loading criteria of .50 (items 17 & 25). Apart from this minor inconsistency, the factor structure essentially replicated the structure of avoidance items on the PAS reported in sample 1.

Reliability.

Scores for all retained items on both factors were summated to produce subscale scores. Cronbach's alpha was found to be good for the two avoidance subscales across the two samples and for both data collection points within the longitudinal study despite the fact that the mean scores for sample 2 indicate a much higher utilization of avoidance strategies than in sample 1 ([controlled avoidance] sample 1 time 1, α .87, $M = 6.43$, $SD = 7.50$; sample 1 time 2, α .87, $M = 5.43$, $SD = 6.85$; sample 2, α .92, $M = 22.61$, $SD = 10.19$; [automatic avoidance] sample 1 time 1, α, .80, $M = 6.21$, $SD = 6.43$; sample 1 time 2, α .84, $M = 6.47$, $SD = 6.60$; sample 2, α .82, $M = 15.23$, $SD = 7.49$). Test-retest reliability over the six month period (sample 1) was $r = .78$ on the controlled avoidance scale and $r = .73$ on the automatic avoidance scale indicating two fairly stable constructs over this time period.

Convergent Validity.

The two avoidance subscales were significantly correlated with one another for sample 1 time 1 ($r = .45$, p<.01). Given that shared variance accounted for only 20.25% of

the total variance, this indicated they were measuring different aspects of avoidance. This was supported by the non-significant correlation between the two avoidance subscales in sample 2 ($r = .23$, n/s).

As expected both avoidance subscales were significantly positively associated with measures of trauma-related distress. In sample 1, the strongest associations were with the IES Avoidance subscale (controlled avoidance $r = .74$; automatic avoidance $r = .42$); the IES Total (controlled avoidance $r = .70$; automatic avoidance $r = .41$); PSS Avoidance (controlled avoidance $r = .59$; automatic avoidance $r = .38$) and PSS Total (controlled avoidance $r = .61$; automatic avoidance $r = .34$). The weakest association was between PSS Intrusion and automatic avoidance ($r = .26$). In sample 2, the strongest associations were between controlled avoidance and PDS Arousal ($r = .59$, $p<.001$); PDS Total ($r = .57$, $p<.001$); and PDS Avoidance ($r = .52$, $p<.001$). Automatic avoidance was most strongly associated with PDS Avoidance ($r = .34$, $p<.01$) and PDS Total ($r = .28$, $p<.05$). All other associations with automatic avoidance were non-significant. It must be noted that the associations in sample 2 were lower for the automatic avoidance subscale with some of the PDS subscales which again lends some support for the discriminant nature of the controlled and automatic avoidance subscales. To see if the postulated distinction between controlled and automatic avoidance adds to the explanatory power of the framework, scores on each of the PSS subscales (sample 1) were entered together in a simultaneous regression to predict scores on each of the new avoidance subscales.

For this analysis we subdivided the PSS avoidance scale into two subscales: effortful avoidance (items 5 and 6) and numbing (items 7, 8, 9, 10, and 11), based on the Foa et al (1995) exploratory factor analytic study and the Andrews et al. (2006) confirmatory factor analytic study of the PSS. If the two new avoidance subscales are successfully distinguishing between automatic and controlled processes we would expect a

specific association to be found between PSS effortful avoidance and controlled avoidance, and between PSS numbing and automatic avoidance. Together, the four PSS subscales accounted for 42% ($F_{(4,453)} = 84.57$, $p < .001$) of the variance on the controlled avoidance subscale, and 15% ($F_{(4,460)} = 22.13$, $p < .001$) of the variance on the automatic avoidance subscale. Higher controlled avoidance scores were associated with higher scores on PSS arousal ($\beta = .22$, p < .001) and PSS effortful avoidance ($\beta = .37$, p < .001) and automatic avoidance was associated with PSS numbing ($\beta = .42$, p<.001).

The above analysis was repeated using sample 2 data and the PDS was split into avoidance and numbing symptom groupings in the same way. Together, the four PDS subscales accounted for 45% ($F_{(4,105)} = 21.19$, $p < 0.001$) of the variance on the PAS controlled avoidance subscale, and 16% ($F_{(4,110)} = 5.19$, $p < 0.001$) of the variance on the automatic subscale. The specific relationships indicate that PAS controlled avoidance was significantly associated with PDS effortful avoidance ($\beta = .46$, $p < .001$) and arousal ($\beta = .33$, $p < .01$) while PAS automatic avoidance was significantly associated with PDS numbing ($\beta = .40$, $p < .001$).

Predictive Validity

A series of multiple regressions were used to assess for the predictive validity of the new measure of avoidance (looking at each trauma distress measure separately) using sample 1 data. Time 2 scores on each trauma distress measure (PSS and IES) were the dependent variables. At Step 1, Time 1 scores on the trauma distress measures were entered, to control for Time 1 symptom level[1]. At Step 2, the Time 1 PAS controlled avoidance and automatic avoidance scales were added. This analysis explored whether the addition of the PAS subscales accounted for a significant proportion of the variance in the dependent variable. Analysis of the co-efficients for each PAS subscale made it possible to

examine whether automatic and controlled avoidance differentially predict Time 2 trauma distress symptoms.

Table 3 shows the results of the seven multiple regressions with PSS and IES subscales as dependent variables. As expected, Time 2 symptoms were significantly related to Time 1 symptoms (ps all < .001). When controlling for this effect, the PAS accounted for a significant proportion of the variance for all symptom measures (ps all < .05) except PSS Avoidance. In all cases, greater PAS avoidance was associated with greater Time 2 symptoms. Exploration of the beta co-efficients for each subscale separately revealed that both PAS automatic and controlled avoidance uniquely accounted for a significant amount of the variance on IES total score and IES avoidance. PAS controlled (but not automatic) avoidance uniquely accounted for a significant amount of the variance on IES intrusions, PSS arousal and PSS intrusions. PAS automatic (but not controlled) avoidance was uniquely related to PSS avoidance (despite not contributing a statistically significant amount of the variance).

- Insert Table 3 here –

Discussion

Overall, results supported the theoretical distinction we postulated between controlled and automatic avoidance, but not the fractionation of avoidance of emotional feeling from avoidance of emotion related information. The psychometric properties of the PAS indicate that it is a valid and reliable measure of avoidance which distinguishes controlled attempts to avoid trauma-related phenomena from automatic avoidance processes.

One of the main limitations of a study exploring avoidance as a construct is that of recruitment. By definition anyone wanting to avoid reminders of a traumatic event will

probably not volunteer to take part in a study requiring them to think about the traumatic event in question. This may explain the relatively low response rates in both samples. In relation to this, many of the traumatic experiences reported by participants were in the distant past; the mean time lapsed in the emergency service sample was 78 months. It is possible that the need to avoid in these samples has reduced given the periods of time involved. Another issue with the emergency service sample was the way in which the participants were recruited. The emergency service departments retained control over the recruitment strategy with some randomly distributing questionnaires via pigeonholes (fire and police forces) whilst others asked volunteers to contact the Personnel Department (ambulance personnel) for further information or to sign up to the study. The latter procedure has a number of problems in relation to the current study: first, only those who are extremely motivated to participate will put themselves forward; secondly, those who might have participated in the anonymous cross-sectional study may have been put off by having to enquire about the study in person. The impact this had on the recruitment is clear from the low numbers of ambulance personnel that participated in the study when compared to police and fire personnel. Our feeling is that a higher number of ambulance personnel than is indicated here experience traumatic events during their work and more may have participated if the questionnaires had been randomly distributed as with the other departments.

Whilst the eating disorder sample also has an unequal demographic as the majority of participants are female it does not suffer from the same sampling problem as all potential participants were sent the questionnaire and only those who had experienced a traumatic event and wanted to take part returned it. Studies have indicated that the prevalence of eating disorders in men is very low (around .16% with anorexia nervosa and .13% with bulimia nervosa: Woodside, Garfinkel, Lin, Goering, Kaplan et al, 2001) and

women outnumbered men by a ratio of about 10:1 (Hoek & van Hoeken, 2003). The proportion of men in the present study was slightly lower than that and so may not be truly representative of all people with eating disorders. However, the inclusion of men in our sample is itself fairly unusual. Given their relative rarity, the vast majority of studies in eating disorders exclude men altogether.

A second limitation is that it is not clear whether people are symptomatic because they avoid or whether they avoid because they are symptomatic. Many studies propose that avoidance is synonymous with maladaptive coping (e.g. Riptoe & Rogers, 1987) whilst others have illustrated that many different types of avoidance strategy (e.g. using alcohol or drugs to dull the effect of a trauma, disengagement and denial) are related to psychological distress (e.g. Riolli & Savicki, 2010). However, one study looking at attempts to avoid versus successful avoidance found that successful avoidance is not associated with distress, it is the unsuccessful attempts to avoid (i.e. trying to avoid trauma-related information or emotions but not being able to do this) that are related to distress (Andrews et al., 2002). This raises the question of whether some people are able to successfully avoid trauma-related stimuli with no detrimental effects while others cannot. Consistent with this possibility, there is preliminary evidence in healthy populations that the use of emotional suppression (effectively a form of avoidance) can minimize trauma like reactions to distressing material (Dunn, Billotti, Murphy & Dalgleish, 2009). Moreover, it appears that the consequences of intentionally suppressing emotions differs in individuals who are high and low in negative affect (Dalgleish, Yiend, Schweizer & Dunn, 2009).

One interesting point is in relation to measures of experiential avoidance (EA) e.g. the Acceptance and Action Questionnaire (AAQ: Hayes et al., 2004). The PAS does appear to have some overlap with the AAQ, indeed one of the common features is the

transdiagnostic nature of the PAS. However, the PAS was designed with trauma-related avoidance as its primary concern and as such we would expect it to be more predictive of PTSD symptoms than a less trauma-specific measure such as the AAQ. This is evident in the predictive ability of the PAS whereas some studies using the AAQ have not found it to be associated with trauma-related avoidance when controlling for other concepts like mindfulness (Thompson & Waltz, 2010). Whilst the aim of EA and controlled and automatic avoidance may be the same (e.g. to reduce the emotional impact of aversive thoughts, feelings and sensations) the AAQ and the PAS assess very different aspects of avoidance with the AAQ assessing more general aversive strategies whereas the PAS assesses only very specific trauma-related avoidance. Other studies have also suggested that the AAQ may be too broad to specifically account for PTSD symptoms (Morina, 2007). Given these conceptual differences between EA and the PAS future research may consider including both measures to explore areas of overlap/differentiation.

One important implication is that controlled avoidance appears to be more strongly related to PTSD symptoms than automatic avoidance. Whilst this was not predicted it does have therapeutic benefits as controlled avoidance is amenable to change. Therefore, successful therapeutic outcome may depend upon those therapeutic processes that reduce controlled avoidance. If PTSD symptoms were more closely related to automatic avoidance, which is not as amenable to change, the measure would be less useful as its main therapeutic function would be in predicting potential therapeutic failure with the main techniques used e.g. exposure therapies. Again, it would be useful for future research to recruit a sample whose trauma was more recent, higher in avoidance and with a non-occupational trauma in order to identify whether this relationship between controlled avoidance and PTSD is stable across trauma types and symptom severity.

In summary, the PAS is a valid and reliable measure of trauma-related avoidance that promises to be a useful assessment instrument for both clinical and occupational health settings.

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Footnote

[1] These regression analyses were also run controlling for job type (dummy coded with Police as the reference category). The inclusion of this control variable did not change the outcome of the regression analyses. We then re-ran all analyses controlling for length of service and gender, again these did not change the results of the regressions reported here.

Table 1

Component matrix of the exploratory factor analysis for the 44 Posttraumatic Avoidance Scale items in the emergency services sample (n = 485) in Study 1.

	Component			Mean	SD
	1	2	3		
1. Do you find that you cannot remember details of what happened even though you were conscious at the time?				0.48	0.93
2. When you go over the event, do you feel nothing at all?				1.16	1.31
3. Do you try to put thoughts and memories of the event out of your mind?	0.61			0.87	1.25
4. Do you try not to get upset about what happened?	0.57			1.25	1.57
5. Do you find that you can remember everything that happened during the event in vivid detail?				2.35	1.60
6. Are your memories of the event accompanied by lots of emotion?	0.67			0.99	1.21
7. Do you avoid things that might remind you of the event?	0.74			0.38	0.90
8. Do you think you are a weak person if you get upset when you remember the event?	0.54			0.41	0.94
9. Does it feel like the event never happened?		0.56		0.39	0.87
10. Do you feel no emotions about the event even though you want to?		0.52		0.59	1.04
11. Are you happy to go over what happened with other people?			0.62	2.90	1.42
12. Do you make sure you let others see how you feel about the event?			0.65	1.40	1.48
13. Does it feel that the event was not real?		0.61		0.43	0.90
14. When you go over the event, does it feel like your emotions have been switched off?		0.61		1.14	1.37
15. Do you make an effort not to talk about what happened?	0.59			0.65	1.10
16. Do you believe that getting upset about the event with others just burdens them?	0.58			1.05	1.36
17. When you go over the event, does it feel like you are watching yourself or seeing yourself as if it was another person?		0.56		0.78	1.27
18. Is it difficult to talk about the event without getting upset?	0.71			0.59	1.02

Table 1 continued

	Component			Mean	SD
	1	2	3		
19. Do you avoid going to places that might remind you of what happened?	0.60			0.21	0.72
20. Do you think it's best to keep a stiff upper lip concerning the event?				1.32	1.44
21. When you think about the event, does it seem like you are looking at it through a big glass window so that it seems far away?		0.61		0.50	1.02
22. At the time of the event, did you feel emotionally numb?				1.59	1.59
23. Do you deliberately distract yourself if you find yourself going over the details of the event?	0.66			0.63	1.05
24. When you reflect on your feelings about the event, do you ever think that you should "pull yourself together"?	0.65			0.76	1.17
25. Do you ever get confused about whether the event really happened or you just dreamed it?		0.52		0.13	0.46
26. When you go over the event do your emotions feel numb?		0.58		0.77	1.18
27. Do you find that you keep busy so as not to think about what happened?	0.59			0.49	1.03
28. Do you think it is good to let all your emotions of the event out?			0.72	2.40	1.44
29. Do you find that you remember nothing about the event, even though you were conscious when it happened?				0.12	0.52
30. Do you feel that you got extremely upset and emotional when the event was happening?				0.68	1.19
31. Do you make it clear to your family and friends that you don't want to talk about it?	0.57			0.42	0.90
32. If you find yourself getting upset about the event, do you try to distract yourself by doing something else?	0.73			0.70	1.13
33. Do you think that you will never ever forget the exact details of what happened at that time?				1.70	1.75
34. When you think back to the event are you surprised about how unemotional you were at the time?				1.53	1.50

Table 1 continued

	Component				
	1	2	3	Mean	SD
35. Do you make yourself face things that remind you of the event?				1.01	1.40
36. If you get upset about the event, do you just go with the feelings?			0.57	1.38	1.38
37. Do you ever get reminded of details of the event that up until then you had forgotten?				0.91	1.07
38. When you think about the event, do you feel like crying?	0.68			0.57	0.98
39. Do you find that you often end up talking with people about the event?			0.56	1.35	1.03
40. Do you think it is important to show your friends and family how much the event has upset you?			0.65	1.16	1.24
41. Does it seem like the event must have happened to someone else and not really to you?		0.58		0.25	0.70
42. Do you feel that you should be more upset about what happened?		0.57		0.94	1.15
43. Do you do things to deliberately stop yourself thinking about the event?	0.69			0.39	0.81
44. Do you keep your feelings about the event to yourself?				1.56	1.47

Table 2
Rotated component matrix (varimax rotation) of the 20 item Posttraumatic Avoidance
Scale in Study 3 (Heterogeneous Eating Disordered Population)

Item	Mean	SD	Factor 1	Factor 2
3	2.48	1.17	0.79	
4	2.71	1.12	0.70	
7	2.40	1.09	0.79	
15	2.37	1.27	0.70	
19	2.22	1.45	0.69	
23	2.19	1.10	0.81	
27	2.03	1.28	0.71	
31	2.06	1.41	0.74	
32	2.43	1.14	0.81	
43	2.04	1.17	0.82	
9	1.23	1.19		0.67
10	1.25	1.25		0.53
13	1.59	1.09		0.73
14	1.74	1.09		0.74
17	2.21	1.42		0.46
21	1.65	1.32		0.64
25	0.93	1.17		0.43
26	1.74	1.06		0.68
41	1.33	1.32		0.77
42	1.31	1.21		0.66

Note -
 Item numbers shown here relate to items displayed in Table 1

Table 3
Predictive Validity of PAS Automatic Avoidance and Controlled Avoidance Subscales on Trauma Distress Symptoms at Six Month Follow-up

		R^2 / R^2 change	F / F change	B	Beta	t	sig
	IES Total T2						
Step 1	IES Total T1	.476	$108.036_{(1,119)}$, p=.001	.686	.690	10.394	.001
Step 2	IES Total T1	.070	$9.067_{(2,117)}$, p=.001	.394	.396	4.127	.001
	Controlled Avoidance			.562	.301	3.068	.003
	Automatic Avoidance			.311	.151	2.119	.036
	IES Intrusion T2						
Step 1	IES Intrusion T1	.376	$71.821_{(1,119)}$, p=.001	.550	.613	8.475	.001
Step 2	IES Intrusion T1	.036	$3.565_{(2,117)}$, p=.031	.395	.441	4.540	.001
	Controlled Avoidance			.184	.199	1.986	.049
	Automatic Avoidance			.095	.093	1.141	.256
	IES Avoidance T2						
Step 1	IES Avoidance T1	.480	$110.061_{(1,119)}$, p=.001	.777	.693	10.491	.001
Step 2	IES Avoidance T1	.102	$14.212_{(2,117)}$, p=.001	.398	.395	3.886	.001
	Controlled Avoidance			.375	.349	3.683	.001
	Automatic Avoidance			.216	.183	2.685	.008
	PSS Total T2						
Step 1	PSS Total T1	.645	$208.833_{(1,119)}$, p=.001	.771	.803	14.451	.001
Step 2	PSS Total T1	.019	$3.192_{(2,117)}$, p=.045	.673	.700	9.189	.001
	Controlled Avoidance			.079	.085	1.070	.287
	Automatic Avoidance			.118	.115	1.853	.066
	PSS Intrusions						
Step 1	PSS Intrusion T1	.384	$73.526_{(1,118)}$, p=.001	.617	.620	8.575	.001
Step 2	PSS Intrusion T1	.052	$5.391_{(2,116)}$, p=.006	.444	.445	4.953	.001
	Controlled Avoidance			.072	.228	2.354	.020
	Automatic Avoidance			.034	.098	1.240	.218
	PSS Avoidance T2						

Step 1	PSS Avoidance T1	.658	$225.473_{(1,117)}$, p=.001	.850	.811	15.016	.001
Step 2	PSS Avoidance T1	*.013*	$2.299_{(2,115)}, p=.105$	.784	.748	9.994	.001
	Controlled Avoidance			.002	.005	.066	.948
	Automatic Avoidance			.053	.129	2.068	.041
	PSS Arousal T2						
Step 1	PSS Arousal T1	.432	$89.652_{(1,118)}$, p=.001	.613	.657	9.468	.001
Step 2	PSS Arousal T1	*.038*	$4.166_{(2,116)}, p=.018$	.484	.519	6.111	.001
	Controlled Avoidance			.068	.193	2.092	.039
	Automatic Avoidance			.030	.077	1.005	.317

Note –
IES = Impact of Event Scale; PSS = Posttraumatic Symptomatology Scale.