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Item Type	Thesis
Authors	MacLiam, Fionnula
Publisher	University of Derby
Download date	2026-05-20 21:49:28
Link to Item	<a href="https://hdl.handle.net/10147/87087">https://hdl.handle.net/10147/87087</a>

Anger Management in Post Traumatic Stress Disorder:  
A comparison of Two Methods of Relaxation

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2004

## Acknowledgements:

to my daughter Síofra, for her patience with a very cranky mother; and to my mother Helga, who rescued Síofra from time to time. To both of you for putting up with me; and without whom I couldn't have done it.

To Lesley Shoemaker for advice, encouragement and beer.

## **Abstract**

This pilot study was conducted to see whether either of two relaxation methods had any advantage in either effectiveness or acceptability to clients undergoing anger management as part of treatment for Post Traumatic Stress Disorder due to single incident trauma. Nine clients completed the four week programme. Measures used were widely used questionnaires, the IES-R (Weiss & Marmar, 1997), DASS (Lovibond & Lovibond, 1995) and the NAS (Novaco, 2003); self-recordings; and physiological - blood pressure and heart rate. The two relaxation methods used were Jacobsonian Progressive Muscular Relaxation and Imaginal Relaxation in which the imagery was provided by the clients themselves.

The findings showed no clear results, but suggestions are given for improvements in the design which would enhance a larger study of this topic.

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## **1 Introduction**

A large proportion of my private practice clients attend for Cognitive Behavioural Psychotherapy (CBP) of single-incident trauma due to assault and resulting in Post-Traumatic Stress Disorder (PTSD) symptoms. In addition, many of these clients present with their main problems as being anger and irritability. The research question thus arises from clinical experience, and the comparative paucity of research in PTSD done with this client group.

PTSD occurs in 20-30% of people exposed to traumatic stressors (Adshead, 2000). To put this into an Irish context, and more specifically my own practice population, The Irish National Roads Authority report for 2002 shows 9,582 RTAs involving fatalities or injury for that year (National Roads Authority 2002). This they interpret, in a population of 4 million, as involving 1.7 accidents per thousand of the population. An Garda Síochána, the Irish police force, in their annual report for 2002 quote 10,155 proceedings taken for minor assaults and 5016 for assaults causing harm for that year, and 339 for assaults against gardaí themselves. The Central Statistics Office Household Survey (CSO, 2004) however reports that only just over half the number (51.3%) of assaults committed are reported to the police.

The Central Statistics Office gives a figure of 451 suicides in Ireland in 2002, and the National Suicide Review Group gives a suicide rate of 12.9 per 100,000 of population during the 5 year period 1996-2000 inclusive. Ireland has the second highest rate of youth suicide in the 30 OECD countries (NSRG, 2002). The report Suicide in Ireland 2001 showed that 11 persons killed themselves by jumping in front of a train in the years 1997 - 1998, and this obviously has implications for the wellbeing of train drivers (Tranah, O'Donnell, Farmer & Catalan, 1995). The rate of suicide/fatal accidents by train has

remained constant over the last few years, at 10 - 12 p.a., and 6 fatalities on line between January and July 2004 (Iarnród Éireann, 2004).

An early paper by Mackey (1983) discusses what he calls “the Bus Driver syndrome” in relation to bus drivers working in Belfast during the height of the Troubles, where the buses were often prime targets of terrorism, and the bus drivers felt unable to change jobs due to the high unemployment at that time. This is reflected in my practice population, where many bus drivers are at risk of physical assault and certainly endure an extraordinary amount of verbal aggression especially on certain routes. In addition, for many of the drivers, it is the best-paid job that is available to them and their mortgages depend on them maintaining their earnings.

## **1.2 Aims of the Study**

Anger often manifests in response to trauma (Novaco & Chemtob, 2002) as part of the hyperarousal cluster of symptoms, and generally must be effectively reduced in order to treat the underlying PTSD symptomology (see literature review).

Relaxation is often given as part of an anger management package. Is there any difference between methods of relaxation in terms of

- a. effectiveness?
- b. acceptability to clients?

## **Chapter 2 Literature Review:**

### **2.1 Introduction**

In 1980 Post Traumatic Stress Disorder first appeared in the Diagnostic and Statistical Manual, 3rd edition (DSM-III). The definition was revised in the DSM-III-R and again in DSM-IV. While previously the diagnosis had been to do with the type of event - it must have been outside the range of normal human experience, the diagnosis is now concerned with the reactions, signs and symptoms of the patient, and with the patient's perception of the event. These definitions had implications for the research that was carried out in that war veterans and victims of rape - having had experiences commonly agreed to be "outside the range of normal human experience" - were originally the most studied, whereas now the literature covers people who were involved in road traffic accidents and other events which are relatively common. (cf PILOTS database on PTSD studies.)

Three symptom clusters are associated with PTSD: 1) reexperiencing symptoms: this refers to distressing images, unwanted memories, nightmares or flashbacks of the event that cause distress and attendant physical symptoms such as palpitations, shortness of breath and other panic symptoms; 2) the avoidance of reminders of the event, including people, places or things associated with the trauma and becoming emotionally numb, constricted or generally unresponsive to the environment; and 3) hyperarousal, which is reflected in physiological symptoms such as insomnia, irritability, impaired concentration, hypervigilance and increased startle responses. The response of anger is therefore part of the third cluster. To meet DSM criteria for PTSD, symptoms in each of the three domains must not only be present, but also must be severe enough to cause substantial impairment in social, occupational or

interpersonal domains. Furthermore, symptoms must be present for at least one month. (DSM-IV, 1994)

The physiological reactivity seen in PTSD can create a long-lasting state of arousal which can exacerbate the effects of daily life events, and can create an allostatic load (wear and tear on the physical system) which may ultimately be damaging for the body. This allostatic load reflects not only the person's traumatic experience reactions but also prior and inbuilt experiences and characteristics (McEwan, 2002).

The physiological effects of the emotion of anger are dramatically shown in a retrospective study of myocardial infarction (MI) patients (Mittleman MA et al, 1995) in which 1623 patients were questioned about anger, and found that the relative risk of MI was 2.3 in the two hours after an episode of anger.

From a CBP point of view, it is the meaning of the trauma that brings about the constellation of symptoms, the

“impact of the event or events on [an] individual's current models of self, world and other that is central.” (Power & Dalgleish, 1997, p233) Power & Dalgleish make some very interesting points regarding the generation of anger within PTSD (p247). However, they believe that the third level of appraisal (the “moral” appraisal) is less likely to be invoked when processing resources are limited, whereas victims of crime are perhaps more likely to be immediately aware of the deliberate and malevolent human intent behind the assault.

“According to Averrill’s [1982] work, anger is most usually directed at another person who is perceived to have deliberately or negligently caused personal offense.” (Power & Dalgleish, 1997, p309)

Power, writing on the SPAARS model (Power & Brewin, 1997, p 63) also gives details of inhibitory processes in the experience of emotions and states that emotions may be inhibited both consciously and unconsciously, so that the individual may not be aware of experiencing a particular negative emotion. In the case of men in particular, who may have overvalued ideas (Power & Dalgleish, 1997, p 249) of being able to ‘look after themselves’ (being physically able to protect themselves and their families), they may well inhibit any awareness of fear, and may find anger more acceptable as a response. Given the physiological arousal, the experience of anger might be seen as a defence against the experience of an emotion which might ‘shatter’ (Janoff-Bulmann R, 1992), or give the lie to, underlying assumptions.

Anger is generally seen as a basic emotion (Power and Dalgleish, 1997, p95) and can be experienced on a continuum of mild, or even repressed, to extreme. The experience of anger consists in part of a combination of physiological arousal, stance and facial expression, and cognitive-emotional state. As mentioned above, the third symptom cluster of PTSD relates to physiological hyperarousal, and is often manifested as anger.

There are three distinct strands to the literature reviewed:

- 1 Concerning anger within the constellation of symptoms in PTSD
- 2 Concerning relaxation as part of an anger management package.
- 3 Comparisons of different methods of relaxation

## **2.2 Concerning anger within the constellation of symptoms in PTSD**

Rachael Yehuda (Yehuda R, 1999, Risk Factors for PTSD, American Psychiatric Press)

differentiates between kinds of trauma:

- Man-made
  - malevolent
  - accidental
- Natural disaster

How the cause of the trauma is perceived will effect the meaning of the trauma and also the relative weights of the different classes of symptoms. This has immediate applications in the case of trauma suffered as a crime, as this experience is immediately perceived differently to accidents or natural occurrences.

In Britain, Andrews et al (2000) found that shame and anger play an important role in in the phenomenology of PTSD in victims of violent crime while Schutwohl & Maercker in Germany state that anger is a salient symptom of traumatised victims and a major sign for PTSD. Working with former East German political prisoners, they found that most measures of anger, posttraumatic stress reaction, and social support were significantly correlated, while social support appeared to lessen the level of anger. They indicate that treatments for PTSD might be effectively supplemented by addressing anger and social support. (Schutwohl & Maercker 2000).

Novaco & Chemtob who have written extensively on anger in combat related PTSD, suggest that anger may pose obstacles to the therapeutic relationship, that anger treatment may be useful up to 18-month follow-up, and describe a typology of regulatory deficits associated with anger. While anger reactivity and anger control improved when directly treated, anger disposition and physiological measures did not reduce (Chemtob et al, 1997; Chemtob et al, 1997; Novaco, 1996) However their client population was not just angry but also heavily aggressive and deficient in anger regulation, and this may be different to the participants of this study. Using a client population closer to my own (psychiatric outpatients) Franklin, Posternak and Zimmermann (2002) found that clients with elevated subjective and expressed anger were more impaired on global measures and that their elevated anger affected some measures of behavioural functioning. Another study in Croatia (Begic D, Jokic-Becic N, 2002) found that the hyperarousal of PTSD which may contain violence, aggression, anger and impulsivity, can cause problems for the clients and their families and that these are the most common reasons for requesting psychiatric treatment. Laor et al (1999), using stronger language than is generally seen in psychological literature, talk about “the devastating impact of affective dysregulation (in PTSD)”.

Several authors (Dahlenberg,2000; Novaco 1996; Sparr, Landy & Drummond 1990) echo the difficulties in establishing a therapeutic relationship with angry clients and of managing anger within the therapeutic relationship. Dalenberg recommends the use of countertransference in managing anger in the client, pointing out that the goal is management rather than prevention of anger, and suggests that the therapist should not pretend to be unaffected by anger in the client and so model anger management.

Treatment implications are also discussed in Foa, Riggs et al (1995) as clients who reported more anger prior to treatment tended to display less fear expression during reliving of the trauma and benefited less from treatment than less angry clients. They postulate that it is the reactivation of fear during exposure treatment that promotes improvement in PTSD. This would appear to bear out my own clinical observations that anger prevents the emotional processing of fear in exposure treatment, and must therefore be reduced first.

Kottler et al (2001) having found that PTSD patients are at increased risk of suicide, found that while impulsivity was correlated with risk, anger was not. Levels of social support were a major factor in suicide risk, and this may well be something that angry clients have difficulty with: by being suspicious of others, by withdrawing from others, or from actively repelling others either consciously or unconsciously.

### **2.3 Concerning relaxation as part of an anger management package.**

Ray Novaco, a leading researcher in the field of anger management, recommends Jacobsonian progressive relaxation as part of an anger management package (Letterkenny, Nov. 03).

While relaxation techniques have been used for thousands of years, Masters et al, 1989, stated that there does not seem to be much in the line of solid theoretical basis for the use of relaxation methods. There was quite a bit of research on relaxation in the 1960s and 1970s but it does not seem to have been extensively studied since then, apart from the recent interest in Mindfulness Meditation. One researcher, H Benson, is one of few exceptions and has been involved in studies on the subject for the last 35 years (Benson et al, 1969, Deckro et al 2002). Recent papers investigate the impact of behavioural medicine - usually a combination of relaxation with CBP together with instruction on nutrition and exercise - and generally find the combined intervention useful in a variety of somatic symptoms. (Deckro et al, 2002; Nakao M et al, 2001). Lar-Goran Öst, the originator of Applied Relaxation (AR), is another exception, but his studies generally apply to the study of panic and generalised anxiety (Öst et al, 2000; Öst et al, 1993). Describing the process of Applied Relaxation, he states that the training in AR is generally taking 10-12 sessions and consisting of Progressive Relaxation, release-only relaxation, cue-controlled relaxation, differential relaxation, rapid relaxation, application training and a maintenance programme (Öst, 1988). The review below will focus more specifically on literature related to the subject of this study.

Jacobson held that when people are relaxed, they think more clearly and are better able to solve their own problems (Lehrer, 1982). Wolpe (1982) suggested that the effects of deep muscle relaxation on the autonomic nervous

system produces a state that is physiologically incompatible with anxiety. This incompatible response seems to be part of the function of relaxation in anger management programmes.

While the use of relaxation can be assumed to have an impact on emotion in the SPAARS model mentioned earlier, Power and Dalglish (1997) do not specifically make mention of it.

McKay, Rogers and McKay (1989), in their self-help book on anger make extensive use of relaxation and imagery as a tool for reducing autonomic arousal and thus reduce or prevent the experience of anger.

In the literature, relaxation as a treatment approach in PTSD was generally compared with exposure, EMDR, cognitive therapy, supportive counselling. In some cases relaxation was given as a 'placebo' control. Sometimes it was given as part of a treatment package, making it difficult to sort the effects of relaxation per se from other aspects of the package. Different relaxation training methods were used: progressive relaxation, sensory awareness relaxation, applied muscle relaxation, simple physiological relaxation, cognitive-relaxation, relaxation (unspecified method).

Deffenbacher et al (2002) compared relaxation with a cognitive-relaxation intervention in the treatment of high anger drivers in a population of university students and found that both interventions lowered indices of driving anger, and lowered trait anger as well. The cognitive-relaxation method also lowered the frequency of risk-taking behaviour. In another study (Deffenbacher et al, 1996), he found that cognitive-relaxation coping skills training led to both a more controlled style of anger expression and clinically reliable change on trait anger, compared to inductive social skills training.

Although Fernandez & Beck (2001) did not use relaxation in their study, they compared the effects of a specific cognitive-behavioural intervention with self-monitoring alone as a method of anger management. Self-monitoring is generally part of the package, and has a secondary consequence known as reactivity which usually produces a change in the desired direction (Kopp, 1988). Part of Fernandez and Beck's CB intervention used imagery incompatible with the experience of anger - from neutral to humorous imagery. They also used thought-stopping and cognitive reappraisal. They found that the CB self-interventions were effective in anger reduction, with an effect beyond that of reactivity. Relevant to the present study was their finding that anger was much more frequent, much more enduring, and much more intense when attributed to a person rather than a situation.

Using an occupational sample of self-referring police officers, Gerzina and Drummond (2000) found that a CBP package for anger management, involving relaxation, produced reduced scores on both anger and anxiety in the treatment group. Another study using a relevant occupational sample of city bus drivers, found that a stress management group using relaxation and anger management significantly reduced the "need for control" - a critical, health-adverse, style of coping with job demands - in the intervention group compared to a control group. (Aust, Peter, and Siegrist, 1998)

Tyson (1998) reviewed the major cognitive and social approaches to reducing reactive aggression and their interdependency on neural mechanisms associated with arousal. Finding that studies manipulating empathy, humour, and sexual content had demonstrated the efficacy of incompatible responses in reducing anger, but that when physiological arousal is high and attributions negative, these incompatible responses could actually increase the chance of

overt aggression, he found that CB programmes reduced aggression by combining relaxation, systematic desensitisation, and biofeedback with cognitive and behavioural techniques.

Interestingly, a recent study, (Lovell et al, 2001), found that relaxation alone was equal to conditions of exposure alone, cognitive therapy alone, or combined exposure and cognitive therapy on reducing arousal symptoms.

## **2.4 Comparisons of different methods of relaxation**

No articles were found which looked at comparisons of relaxation methods in anger; most studies compared relaxation with other methods of anger reduction such as cognitive restructuring or used it as part of a package of anger

management to be compared with relaxation alone or with a control (waiting list) group. One of the major problems with analysing papers comparing relaxation methods is that there does not seem to be any objectively determined definitions of the nomenclature of these methods. For example, one paper compared “Progressive Muscle Relaxation” with “Stretch-Release Relaxation” and “Cognitive Imagery Relaxation” (Yung, French & Leung, 2001) whereas Jacobson’s Progressive Relaxation involves the alternative stretching and releasing of muscle groups (Clark, 1989, Jacobson 1929, 1934, quoted in Bailey 1985). Imaginal Relaxation appeared in various guises and was not always sufficiently defined - terms used included “Cognitive Imagery Relaxation” (Yung et al, 2001), “Guided relaxation Imagery” (Wynd, 1992), “guided imagery” (Baider, Uziely & DeNour, 1994). In Imaginal Relaxation, there may be a different response to imagery provided by the therapist (passive imagery generation) and that which requires the generation of imagery on the part of the client, such as is recommended in Eriksonian hypnotherapy (Baker, 1987). In many cases, the relaxation method used was poorly defined or undefined. Furthermore, the groups of patients used varied from cancer (Baider, Uziely & DeNour, 1994) to hypertension (Sheu, Irvan, Lin & Mar, 2003) **to anxiety (Takaishi, 2000) to endoscopy patients (Salmore and Nelson, 2000) to ‘normals’ (Scheufele, 2000).**

**However, the overall concensus does seems to be that relaxation can reduce physiological arousal levels (Scheufele, 2000, Salmore and Nelson 2000). Relaxation also brings about changes in brain activity. Lazar et al (2000), defining meditation as ”a conscious mental process that induces a set of integrated physiologic changes termed the relaxarion response”, found that meditation activate neural structure involved in attention and control of the autonomic nervous system. Jacobs et al (1996) found reductions in frontal lobe activity while mapping the relaxation response.**

**These physiological and neurological changes are of obvious benefit to those who are stressed and consequently experiencing hyperarousal, such as seen in PTSD and/or anger.**

**Measures used varied: blood pressure (Salmore and Nelson 2000, Salt and Kerr, 1997), heart-rate (Salt and Kerr, 1997), respiratory rate (Salt and Kerr, 1997), Galvanic Skin Response or electrodermal response (Tarrier et al, 2002), electromyographic levels (EMG) (Takaishi, 2000), or combinations of these and other measurements.**

**Several studies found that various methods of relaxation had positive effects on reducing blood pressure. Sheu, Irvan, Lin and Mar (2003) looked at the effects of Progressive Muscle Relaxation in clients with essential hypertension and found significant effects in reducing both systolic and diastolic blood pressure (BP) as well as heart rate (HR). A review in 1989 of 48 experimental studies using nonmechanically assisted relaxation techniques found that all techniques except one (Benson's relaxation technique) demonstrated evidence of effectiveness, especially with nonsurgical samples including hypertension, headache, and insomnia (Hyman, Feldman, Harris, Levin, Malloy, 1989).**

**There were only few articles comparing relaxation methods.**

**One study compared Autogenic Training with Progressive Relaxation using EMG to record arousal levels (Takaishi, 2000). This found Autogenic Training superior in both decreases in EMG levels, as well as in easiness to use for clients with anxiety related disorders for the 93 participants who completed the 6 week course. A 1997 study comparing Mitchell's simple physiological relaxation with Jacobson's progressive**

relaxation found that both methods reduced systolic blood pressure (BP), and progressive relaxation reduced respiratory rate, both to a significantly greater extent than supine lying (Salt and Kerr, 1997)

Another study in the treatment of eczema compared relaxation with or without imagery and found that the imagery intervention was more effective (Horne et al, 1999). Furthermore, they specified that the participants generated the imagery themselves as in Ericksonian hypnotherapy. The fourth study found investigating differences in relaxation methods, used muscular relaxation (one condition of which was Jacobsonian) in comparison to cognitive relaxation in hypertensives (Yung and Keltner, 1996). The cognitive relaxation condition in this study seemed actually more of a guided passive imagery relaxation, as the instructions show:

“Imagine that the muscles of your forearms are becoming more and more relaxed. Feel the sensation of comfort and calmness..... the muscles of your chest are becoming more and more relaxed.....” (Yung & Keltner, 1996, p823)

In any case, they found the Jacobsonian (“tense release”) procedure most effective in reducing systolic BP using matched groups. All relaxation procedures were superior in reducing BP to the control group, who only had their BP and HR measured to control for the effects of the measuring process itself - familiarly known as the ‘white coat syndrome’.

It was interesting to this researcher to note that the bulk of studies on relaxation were found in the nursing indexes rather than the psychological or psychiatric indexes.

**On a note related to the physiological effects of relaxation, physical exercise has been found to promote calmness (Plante et al, 2001), to lower biological stress reactions (Butki et al, 2001), and to lower heart rate responses to stressful situations (Throne et al, 2000).**

## **2.5 Summary**

**To summarise the major points in the sections above, it appears that anger responses may be greater in PTSD when the cause of the trauma is perceived as occurring by deliberate human agency; that anger may cause difficulties in engagement with therapy; and that anger may reduce the amount of social support available to the individual.**

**Relaxation seems to be generally effective in reducing aggression, and certainly seems effective in reducing the arousal symptoms in PTSD.**

**While there is difficulty in analysing which relaxation methods are used in studies, it appears that relaxation can reduce blood pressure, and that imagery can be useful. The most commonly used method of relaxation is Jacobsonian progressive relaxation, and seems to be effective as a technique.**

### **3 METHODOLOGY**

#### **3.1 Research Questions:**

- 1 Is relaxation useful as a method of reducing anger in PTSD as part of a CBT intervention?
  
- 2 Is there any difference between the two methods (Jacobsonian progressive muscular relaxation vs imaginal cue-controlled relaxation) to be used, in terms of both
  - a. anger reduction and
  - b. acceptability to clients?
  
- 3 Can relaxation help reduce the overall levels of arousal in PTSD?

#### **3.2 Hypotheses**

Hypothesis 1: Imaginal relaxation methods will be more effective than progressive relaxation in terms of reduction of the experience of anger in PTSD clients.

Hypothesis 2: Imaginal relaxation methods will be more acceptable than progressive relaxation in terms of reduction of the experience of anger in PTSD clients

Hypothesis 0: There will be no differences in terms of either effectiveness nor acceptability in relaxation methods

These hypotheses will be tested by teaching a small group of participants who all have a diagnosis of PTSD, and who complain of anger as a major symptom,

two types of relaxation (Imaginal and Progressive) as part of an otherwise similar treatment package involving educational, cognitive, and behavioural elements.

Having reviewed referral rates to my practice of clients with PTSD over several 3-month periods in the last 2 years, I envisioned that a sample group of 20 was realistic for the time-frame of the study. The design of the study was based on individuals to be referred during the proposed period, thus:

X -----X -----X  
X -----X -----X  
X -----X -----X

This made it impossible to know in advance exactly how many individuals would actually take part, although 20 seemed likely in the proposed 3.5 months allotted to the trial phase.

Because of this, and because of the kinds of measures taken in previous studies with which I proposed to compare results, I decided on a quantitative methodology for the study. The decision regarding methodology must be driven by

“...what we are trying to find out and why, considered against the background of the context, circumstances and practical aspects of the particular research project.”

(Punch, 1998, p 61)

While a qualitative study would have yielded information on the subjective experience of those individuals participating, the outcomes would have been much more difficult to compare with the existing research.

However, as Hypothesis 2 refers to the acceptability of the relaxation method which is a subjective matter, a questionnaire which would reflect this was drawn up in such a manner as to yield quantitative data. Again, this was for ease of

comparison with objective measures although a qualitative approach would have served well, and perhaps better, in this respect.

### **3.3 Measures Used**

Measures will include physiological measurement (heart rate and blood pressure), psychological questionnaires, and subjective ratings of the effectiveness and acceptability of the relaxation method taught. While anger is found to be associated with increases in blood pressure (Jacob et al, 1999), relaxation is found to have physiological effects in reducing blood pressure (Yung & Keltner, 1996) and so a combination of anger-reduction by cognitive means and relaxation should reduce blood pressure. Heart rate and blood pressure can be easily measured and are neither invasive nor overly intrusive procedures.

Psychological questionnaires already exist to measure anger such as the Novaco Anger Scale (NAS, Novaco, 2003) and to measure PTSD symptoms - eg the Impact of Events Scale - Revised (IES-R, Weiss and Marmar, 1997). In addition, it was decided to measure general stress levels using the Stress subscale of the Depression Anxiety and Stress Scale (DASS, Lovibond and Lovibond, 1995). These questionnaires would allow comparisons of the individual participant with existing norms and facilitate the interpretation of change within the individual, and also across individuals. A larger sample would also allow the generalisation of any results to the population (sufferers of PTSD with anger as a major symptom), and so a pilot study can test out the procedure and measures which may then be used later with the larger sample. In addition, a smaller sample allows the gathering of subjective experiences from the individuals participating, which, although not specifically part of the present study, may be of value in planning a larger study.

A brief questionnaire to gain subjective estimates of the acceptability and usefulness of the relaxation method was also used.

### **3.4 Participant characteristics**

#### 3.4.1 The sample:

The sample (n = 10) is taken from clients referred by psychiatrists for CBT treatment of PTSD, who complain of anger as a primary problem, during the period December 2003 - March 2004. Actual sample is 9 as one participant dropped out.

#### 3.4.2 Inclusion/ Exclusion Criteria:

In addition to diagnosis of PTSD by a psychiatrist, the participants must complain of anger as a primary problem since the index event and agree to taking part in the study. Any of those referred with a diagnosis of PTSD who did not complain of anger were excluded from the study.

#### 3.4.3 Sample Characteristics:

The clients were all male, all employed, and aged between 23 - 50, with an average age of 38.3, sd 8.23. All but 3 had been assaulted in the course of their jobs. Of the assaults, two involved guns, four blunt instruments, and one a knife. All but 2 index events were in the recent past. The interval between the events and first appointment in therapy for the recent events was between 6 - 14 weeks, with an average of 8.8 weeks. See Appendix 11 for brief description of participant characteristics.

### **3.5 Method of data collection:**

Questionnaires were completed by participants, using self-report questionnaires, prior to the first treatment session, and at the third treatment session. Sessions were held fortnightly.

Physiological measures were taken using an electronic wrist device (see Appendix 7 for details of the instrument) during the first treatment session.

These measures were all taken in the same surroundings (my office) in order to maintain consistency of environment.

### 3.5.1 Data Collected

- 1 Novaco Anger Scale (NAS) (Novaco, 2003) on assessment and after 4 weeks of relaxation practice
- 2 The Depression Anxiety and Stress Scale (DASS) (Lovibond and Lovibond, 1995) to measure overall levels of depression, anxiety and stress, on assessment and after 4 weeks of relaxation practice.
- 3 The Impact of Events Scale - Revised (IES-R) (Weiss and Marmar, 1997) has been investigated and found to provide a sensitive measure of traumatic stress, with a cutoff score of 33 (or 38%) providing best diagnostic accuracy (Creamer, Bell and Failla, 2003); also taken on assessment and after 4 weeks of relaxation practice.
- 4 Blood pressure and heart rate recordings, taken before, midway through, and immediately after the relaxation procedure, i.e first trial practice, after 2 weeks of practice and after 4 weeks of practice
- 5 Self-recorded monitoring of the amount, frequency and intensity of anger experiences over the duration of the study

- 6 Self-recorded monitoring of practice of relaxation over the duration of the study
- 7 Brief questionnaire regarding subjective experience of the method of relaxation learnt, after 4 weeks of practice.

### **3.6 Procedure**

Every second person included in the study was assigned to the Imaginal Relaxation condition as part of a structured anger management programme, with the others assigned to the Progressive Relaxation condition. This was to ensure randomisation, which “maximises the probability that [the groups] do not differ in any systematic way.” (Punch, 1998, p72) This approach was taken firstly because I was seeking to investigate the effect of the variables (the relaxation method) and secondly because a larger sample was envisaged. However, as the second hypothesis sought to ascertain the acceptability of the relaxation method, the method used was a short questionnaire to focus an otherwise unstructured discussion of the participants’ experience of the method used. This provided some insight into the participants’ subjective views of the acceptability, ease of use and usefulness of their relaxation method.

## **3.7 Treatment Package**

### 3.7.1 First Session

Treatment began in the first session after the initial assessment. This consisted of

- discussion regarding autonomic arousal, stress, and anger; and  
regarding PTSD, carrying on from the psycho-education begun in the assessment session
- an exploration of causes of angry outbursts
- to whom anger was expressed, and the costs/disadvantages entailed
- the physiological consequences of anger, both expressed and repressed
- an exploration of the benefits of managing anger
- recommendation of the use of exercise to reduce physiological arousal

- strategies which might be employed to reduce the felt emotion (“first aid”: leaving the situation, physical exercise, and alternative interpretations)
- introduction to, and first practice of the assigned relaxation condition, including physiological measures
- homework assignments: record-keeping of anger episodes (Appendix 9), instructions to practice relaxation X3 per day (Appendices 1 and 2) and recordings of practice sessions (Appendix 8)

### 3.7.2 Second Session (2 weeks after first session)

- review of homework record-keeping
- any thoughts about the effects of anger, anger episodes, and strategies for reducing the felt emotion
- exploration of success/failure of “first aid” strategies employed
- in-session challenging angry schemata by modifying appraisals of situations
- relaxation, with repeat of physiological measures
- homework: record-keeping of anger episodes, instructions to practice relaxation X3 per day and record-keeping of this, and implementation of relaxation technique assigned when anger levels are perceived to be increased

### 3.7.3 Third Session (4 weeks after first session)

- review of homework record-keeping

- any thoughts about the effects of anger, anger episodes, and strategies for reducing the felt emotion
- exploration of success/failure of “first aid” and cognitive strategies employed
- in-session challenging angry schemata by modifying appraisals of situations
- repeat of physiological measures on relaxation condition
- repeat of self-report questionnaires
- completion of questionnaire regarding subjective experience of relaxation method learnt.

### **3.8 Data Analysis:**

The data collected is in several discrete categories: questionnaire results, physiological measurement results, self-recording results, and the subjective questionnaire results. These can then be compared pre- and post-intervention, both within participants and across the entire group, with perhaps some implications for the different relaxation methods. The present study is a pilot, and should suggest possible improvements in procedure, measurement, or other changes which may be necessary for a larger more representative sample.

### **3.9 Statistical Analysis**

Due to the small size of the sample, it was considered inappropriate to apply any statistical analysis to the data. With such a small sample it is impossible to generalise due to individual variability of the participants, and so any statistical test results would be invalid. Any difference between the two groups cannot

reasonably be ascribed to chance variation (Runyon & Haber, 1967). The larger the sample, the more easily the findings can be inferred back to the population from which the sample is drawn. For these reasons, the present study can only be regarded as a pilot study.

### **3.10 Ethical Considerations**

Ethical considerations are of the utmost importance in studies of this type. The investigation concerns the usually very private and often shameful reactions of individuals to adverse events and so the assurance and practice of confidentiality and of informed consent were of great importance to participants. For the study itself, it is important to consider researcher bias.

#### **3.10.1 Informed Consent & Confidentiality**

Participants were given the Information Sheet (Appendix 6) regarding the present study on the first appointment if they fulfilled criteria for inclusion in the study. This guaranteed their anonymity, that details other than those required for the study would be kept confidential, and also offered to let them know of the study results should they be interested. The interval between the first appointment and the beginning of treatment was usually about 2 weeks, during which time they could ask any questions, and to ensure that nobody felt under duress to consent to participation in the study. They were also assured that

they could 'drop out' of the study if they so wanted without any negative implications for their treatment.

The ethical aspects of the study were considered using the Beauchamp and Childress (1994) guiding ethical principles of respect for autonomy, beneficence, non-harming, and the professional-client relationship.

Respect for autonomy includes the competence of the individual in making decisions; the ability to make autonomous choices; informed consent and voluntariness. Discussing the leaflet on the research project with each client, I made it clear that the decision to take part was entirely up to them, and that they could withdraw consent at any time, without any negative impact on their treatment or therapy. In terms of beneficence, I did clarify that relaxation is generally an integral part of anger management, but that what I was investigating was the effect of different styles of relaxation. The clients readily understood the possible benefits of relaxing, and were assured that, if they liked, they could learn a different method at the end of the 4 week trial. The principle of non-maleficence, or non-harming, was covered in that lack of consent to take part in the study carried no penalty and treatment would go ahead as normal. This again was made very clear to the individuals with whom I discussed the possibility of participation in the study.

Commitment to therapy is in any case a free choice in my client population, and is something that I make them aware of from the beginning. This is because they are often referred through their workplace and sometimes arrive under the impression that therapy is obligatory. Beauchamp & Childress (1994) include confidentiality under the heading of the professional-client relationship, which also includes the principles of veracity, privacy, and fidelity. While these concepts are of great importance in therapy overall, they become even more so when dealing with angry clients who can often be suspicious of the motives,

truthfulness, and openness of those professionals to whom they are referred. Again, this is often of great concern within my client population as they may be afraid that the content of therapy sessions might be divulged to their employer, or that I am 'on the side of' the employer, as they may be in conflict with the organisation, or even in the process of taking legal action against their employer. These issues need to be addressed from the very beginning, and the discussion on participating in the study often flowed naturally from this.

### **3.10.2 Consultation with Peers and Referrers**

As the proposed study was to take place within my private practice setting, there is no relevant ethics committee. However, I discussed the study with regular referrers, which include Occupational Physicians, Psychiatrists, and Employee Assistance Programme Officials. I have also discussed the proposed study with 2 cognitive-behavioural psychotherapy colleagues, who also maintain private practices, using the guiding principles of Beauchamp and Childress (1994) of respect for autonomy, beneficence, non-harming, and confidentiality, detailed above. None of these colleagues has had any ethical reservations about this study.

One study previously examined the effect of participation in research by trauma survivors, sampling 430 survivors, and found that participation was very well tolerated by most survivors of domestic violence, rape and assault (Griffin, Resnick, Waldrop & Mechanic, 2003).

### **3.10.3 Researcher Bias**

Researcher bias is important to consider, as I am aware of having a marked preference for imaginal relaxation method, feeling it to be both generally more effective and certainly more acceptable for clients. I feel a shorter method is easier to practice in real life, and the more easy the method is to use, the more frequently it will be used, and so the progress is liable to be greater. From clinical practice, it seems that most people can imagine scenes of tranquillity fairly readily and this helps the imaginal exposure. Progressive relaxation, in contrast, requires attention to various muscle groups and takes longer; thus interruption of the practice is more likely in the real life situation i.e. at home, by other family members. It may also be more embarrassing, or increase self-consciousness, for the participant due to the facial grimaces and physical gestures required, even when practising in isolation.

Researcher bias is well-known to have the potential to impact on participants, and thus results. Pierce, quoted in Wagstaff (1996), commented almost 100 years ago:

“It is to the highest degree probable that the subject’s .... general attitude of mind is that of ready complacency and a cheerful willingness to assist the investigator in every possible way by reporting to him those very things that he is most eager to find, and that the very questions of the experimenter ..... suggest the shade of reply expected.”

It is therefore necessary to ensure that both kinds of relaxation were presented in the same way, and that this researcher’s reactions to results, such as B/P which was immediately available, are as neutral as possible.



## 4 RESULTS

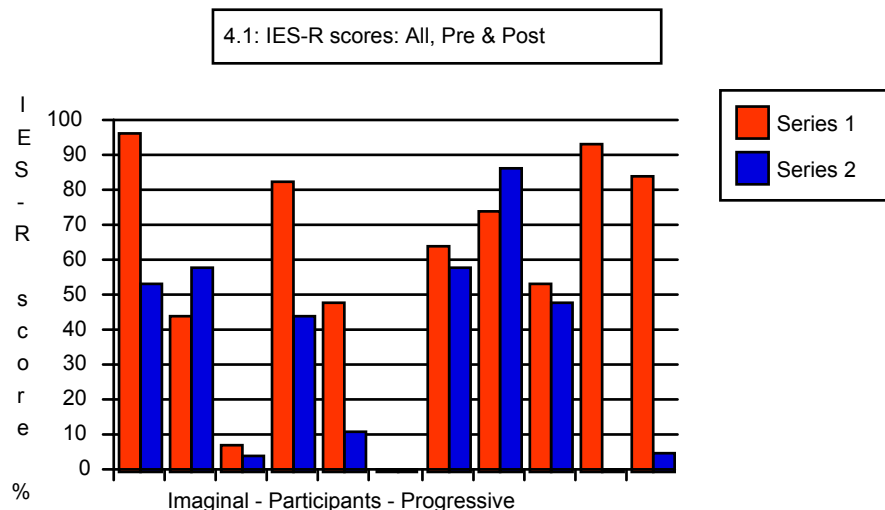
### 4.1 Questionnaire results

The results of the various questionnaires are explored separately below.

#### 4.1.1 IES-R results

The IES-R (Weiss & Marmar, 1997) (Appendix 3) questionnaire taps into the three major domains of symptoms clusters described in the DSM-III and now DSM-IV criteria. Scoring is on a 0 - 4 scale per item, corresponding to 0 = not at all, 1 = a little bit, 2 = moderately, 3 = quite a bit, and 4 = extremely. Weiss and Marmar give details of reliability and validity in the 1997 paper and other reports also study these (Marmar et al, 1996; Creamer et al, 2003). As mentioned above (Chapter 3, section 3.4.1,3) a cutoff score of 33 (or 38%) is regarded as providing best diagnostic accuracy (Creamer, Bell and Failla, 2003)

Only one participant had a score below this on the first administration of the questionnaire, but by the third session three participants fell below this score. Seven participants reduced their scores by various levels, while two (Participants 2 and 5) had increased scores on re-taking the questionnaire. By group, 1 participant in each group had increased their scores (Participants 2 and 5). See **TABLE 4.1** below: (Series 1 = pre; Series 2 = post)



#### 4.1.2 DASS-stress results

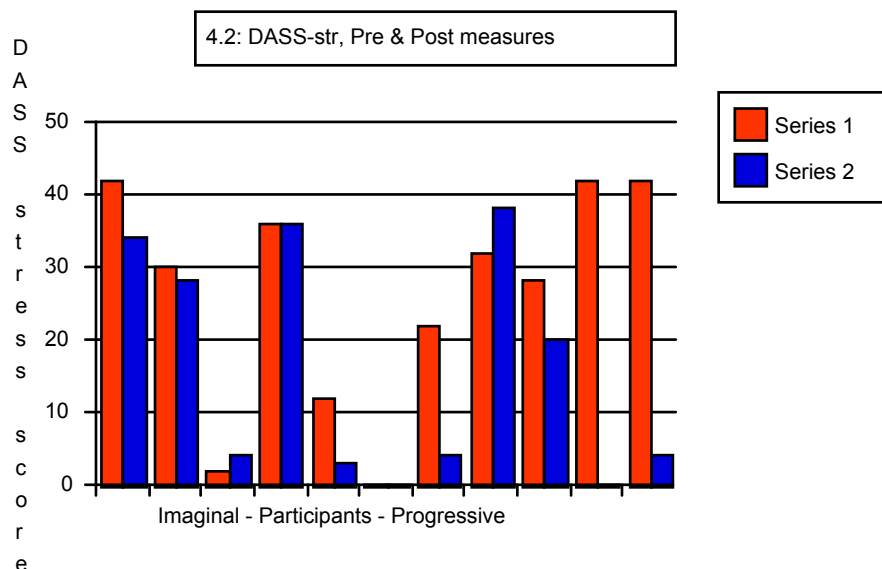
The short version of the DASS was used, which has 21 questions using a scoring system of 0 = Did not apply to me at all, 1 = Applied to me to some

degree, or some of the time, 2 = Applied to me a considerable degree, or a good part of the time, 3 = Applied to me very much, or most of the time. Scores are then doubled to give the normative data. The scores on the stress subsection indicate 1-14 = normal, 15-18 = slight, 19-25 = moderate, 26-33 = severe, and 34+ = extremely severe (Lovibond & Lovibond 1995).

As can be seen, Table 4.2, below, of the 10 original participants, 4 scored in the Extremely Severe range, 3 in the Severe range, 1 in the Moderate range, and 2 in the Normal range on the first measurement. By group, there were 2 Extremely Severe in each group, 1 Severe in the Imaginal group and 2 Severe in the Progressive group, 1 Moderate in the Progressive Group, and 2 Normal in the Imaginal group.

Interestingly, all those in the Imaginal Group stayed in the same severity range on the final measurement of the study, while 3 in the Progressive group (Participants 4, 7, and 10) reduced their scores. However, 1 from the Progressive group (Participant 5) increased his score from Severe to Extremely Severe during this time.

**Table 4.2 DASS-str pre & Post measures:**  
(series 1 = pre, series 2 = post)



### 4.1.3 NAS results

The results of the NAS are considered by the various sub-scales - Cognitive, Arousal, Behaviour, Total score, Anger Regulation, and finally the Index which gives a measure of internal consistency. Scores are given in their t-score form, which allows comparison with standardised norms. For all domains except the Index, the interpretation of scores is as follows (Novaco, 2003):

≤ 29                      very low

30 - 39	Low
40 - 44	Low Average
45 - 55	Average
56 - 59	High Average
60 - 69	High
≥70	Very High

The scores on Cognitive, Arousal, Behaviour, and Total indicate how likely the individual is to react with anger in an aversive situation. The score on Regulation however indicates effective anger coping responses. Finally, the Index indicates internal consistency, the absence of which is seen to reflect deliberate or unintentional falsification in completion of the questionnaire.

#### **4.1.3.1 NAS cog**

The Cognitive sub-scale of the NAS measures justification of anger or external blame, suspiciousness, the tendency to ruminate on anger experiences and hostile attitude to others.

Three participants (1, 5, 10) had increased scores on this domain over the course of the study; two (3,4) reduced their scores, and four remained within the same range, including one who remained within the Very High range. Although all participants had complained of anger as a symptom after the precipitating event, 4 (1,2,7,8) fell within the Normal range on first measurement.

#### **4.1.3.2 NAS aro**

The Arousal sub-scale of the NAS measures intensity and duration of anger, bodily tension and irritability.

Four participants (3, 4, 8, 10) showed reductions on their scores sufficient to change the range within which they fell; one increased (7), and four remained within the same range. Four (2, 4, 7, 8) had fallen within the Normal range on first measurement.

#### **4.1.3.3 NAS beh**

The Behaviour sub-scale of the NAS measures indirect expression of anger such as displacement, verbal aggression, impulsive reactivity, and physical confrontation.

On this domain, 4 showed reductions on their scores (1, 4, 6, 10) sufficient to change the range within which they fell; 3 however increased their scores (3, 5,

8), and 2 remained within the same range. Again, 4 (1, 2, 5, 8) had fallen into the Normal range on first measurement.

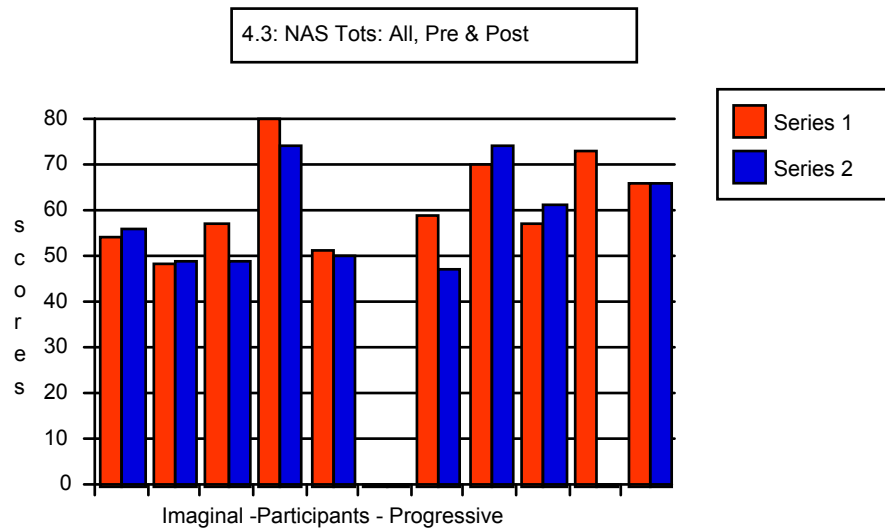
#### 4.1.3.4 NAS tot

The Total score is the sum of the previous subscales.

The changes over the duration of the programme showed 2 increases in Total scores (Participants 1 and 7); 2 decreases (3 and 4); the other 5 participants remained in the same range. Three participants (1, 2, 8) fell into the Normal range on first measurement despite subjective reporting of a distressing increase in anger levels experienced.

**Table 4.3: NAS tot, pre & post measures:**

(series 1 = pre, series 2 = post)

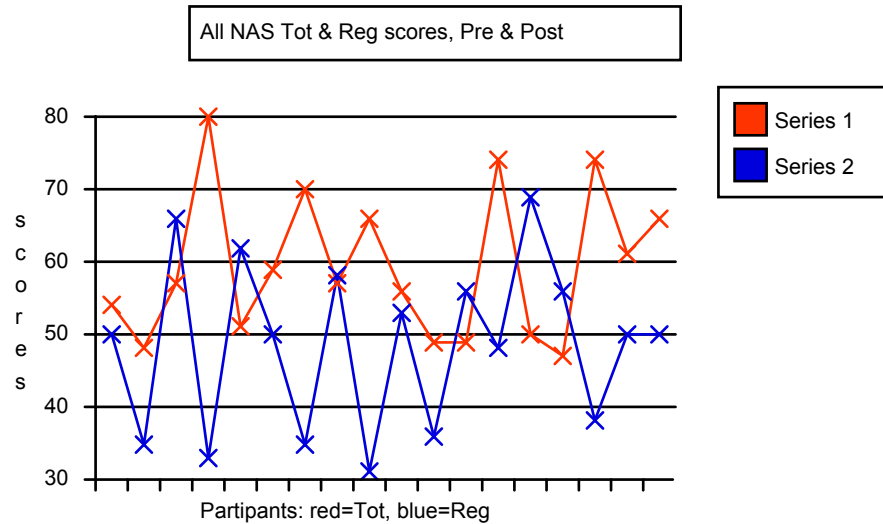


#### 4.1.3.5 NAS reg

The Anger Regulation sub-scale of the NAS measures manifestations of anger control in the previous domains - cognitive, arousal and behavioural. Novaco states that “it is to be expected that the Regulation score will be inversely related to the Cog, Aro, Beh and Total scores” (Novaco 2003, p17).

The changes over the duration of the programme showed 3 increases in Regulation scores (Participants 4, 6, 10); 2 decreases (3 and 7); the other 4 participants remained in the same range. Two participants (1,4) fell into the Normal range on first measurement. The posited inverse relationship between the Total score and Regulation score did not seem to be borne out in this sample. See Table 4.4

**Table 4.4: NAS Tot & Reg scores, Pre and Post**



**4.1.3.6 NAS index**

As remarked above, the Index indicates internal consistency, the absence of which is seen to reflect falsification in completion of the questionnaire. Novaco recommends that an Index score of 2 or above should provoke enquiry as this “is associated with a 93% likelihood that responses were given without regard to item content, increasing to 99% for a index scores of 3 or higher” (Novaco, 2003, p11).

There were 2 scores of 3 on the Index measure; both were on first measurement, and were one participant from each group. Interestingly, there were two scores of 2 on the final measurement occasion, both in the Imaginal group.

However Novaco (2003) also states that there may be other reasons than deliberate or otherwise falsification of the responses which would give rise to an Index score of 2 or above. These might be deliberate under-reporting, an “unusually limited capacity for self-monitoring” (Novaco, 2003, p13), or more complex reasons of judgementality, social labelling, and the psychosocial role of anger.

#### 4.1.4 Summary

The questionnaire results are extremely mixed and lead to no obvious conclusions.

Seven of the 9 participants reduced scores on the IES-R scale, while only 3 of them reduced on the DASS-stress scale.

**Table 4.5: Changes in After scores by Measure and Participant**

Reduced scores (no.)	Participants	Measure	Increased scores (no.)	P'pants
3	4, 7, 10	DASS-str	1	5
7	<b>1, 3, 6, 8</b> 4, 7, 10	IES-R	2	5
3	<b>3, 4</b>	NAS-Cog	3	<b>1, 5, 10</b>
4	<b>3, 8, 4, 10</b>	NAS-Aro	3	<b>1, 5, 10</b>
4	<b>1, 6, 4, 10</b>	NAS-Beh	3	<b>3, 8, 5</b>
2	<b>3, 4</b>	NAS-Tot	2	<b>3, 7</b>
3 (increase)	<b>6, 4, 10</b>	NAS-Reg	2 (decrease)	<b>3, 7</b>

Bold type indicates Imaginal group participants;  
plain type indicates Progressive group participants.

Appendix 4 shows the questionnaire score results by each participant.

## 4.2 Self recordings

None of the participants maintained self-monitoring records in the intervals between sessions. As regards the Relaxation monitoring, all participants stated that they had indeed been able to practice relaxation 2 - 3 times daily. Although the participants did provide verbal reports of individual angry incidents, typical comments regarding the self-recording were “I was irritable all the time” or “I didn’t know what to write down, there was too much”.

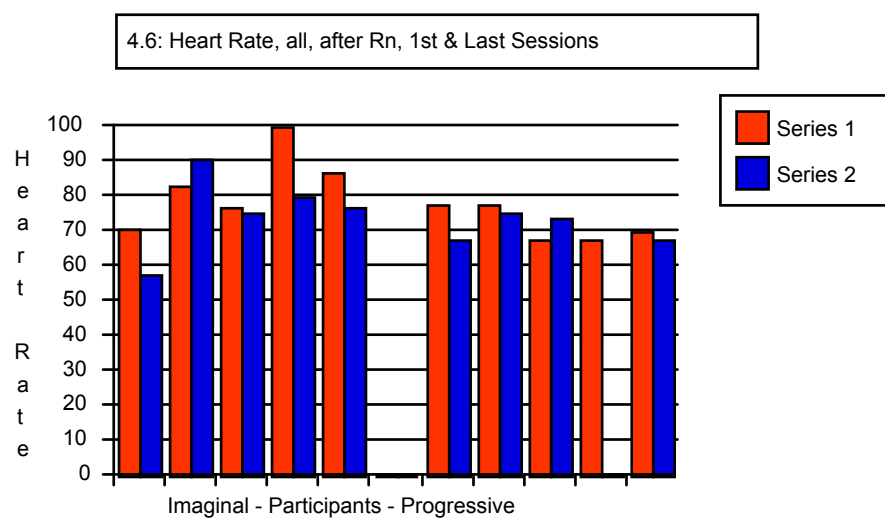
## 4.3 Physiological recordings

### 4.3.1 Pulse

Of the 9 participants who completed the study, 5 had reductions in pulse rate as measured post relaxation in the first and last sessions. 2 had increases and 2 remained the same. Changes in heart-rate of less than 4 bpm were not regarded as change, as only one recording was made on each occasion.

**TABLE 4.6 - Changes in Heart Rate**

series 1= first session, series 2 = last session



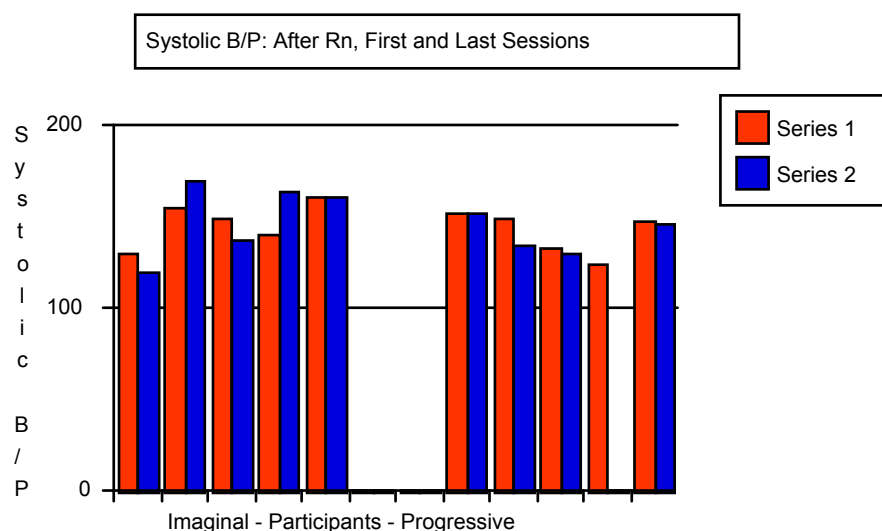
### 4.3.2 Blood Pressure

Comparing post relaxation systolic blood pressure between the first and last recordings, 2 participants had an increase, 2 a decrease and one remained the same; on diastolic measurement, 3 had reductions and 2 increases in the Imaginal group.

In the Progressive group, 3 participants had reductions on the systolic measurement and 1 remained the same; on the diastolic, 2 had reductions and 2 remained the same. (Differences of 1 mmHg were disregarded as only one recording was made on each occasion.)

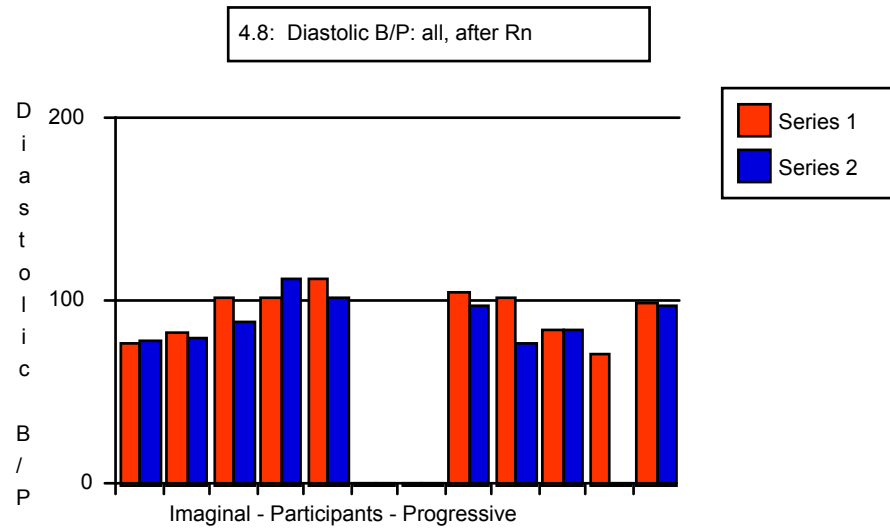
**TABLE 4.7: Changes in BP (Systolic)**

series 1 = First session, series 2 = last session



**Table 4.8: Change in BP (Diastolic)**

series 1 = First session, series 2 = last session



#### 4.3.4 Summary

As can be seen from the result above, the results were very mixed with no clear tendency overall. While 7 participants reduced scores on the IES-R measure, only 2 reduced their Total score on the NAS. Six participants reduced their Stress scores on the DASS. Only 1 participant (4, in the

Progressive group) reduced scores on all three questionnaire measures. (See Appendix 4)

On the physiological measures, 5 had reductions on their heart rate. Regarding the blood pressure measurements, 5 had reductions on the systolic measure and 5 on the diastolic measure. Only 2 participants - one from each group (3,5) - had reductions on both systolic and diastolic measures. None had reductions across all three measures.

#### **4.4 Relaxation acceptability**

The questionnaire, Appendix 10, was completed by all participants. A 0 - 10 scale was used on the first 3 questions, where 0 indicated 'not at all', and 10 indicated 'extremely'.

The scores given to "the method of relaxation I learnt was easy to learn" ranged between 7 and 10, with an average score of 8 for each method ( $X = 8.2$ , range 7 - 10 for Imaginal group;  $X = 8.5$ , range 7 - 10 for the Progressive group).

The second question - "the method of relaxation I learnt was easy to practice" - again ranged from 7 to 10, with an average of 8 for each method (  $X = 8.4$ , range 8 - 10, for Imaginal group;  $X = 8.5$ , range 7 - 10, for the Progressive group).

The third question - "the method of relaxation I learnt was useful" - gave rise to scores of between 5 and 10. The averages per group were 8.2 for the Imaginal group (range 6 -10) and 6.75 (range 5 - 8) for the Progressive group.

"I liked the method" had only Yes or No responses possible. By group, the Imaginal group (N = 5) returned 4 Yes and 1 No; the Progressive group (N=4) returned 3 Yes and 1 Yes/No.

"I would prefer to learn a different method of relaxation" gave rise to mixed responses. The Imaginal group returned 2 Yes, 1 No and 1 Yes/No; the Progressive group returned 2 Yes, 1 No, and 1 Yes/No.

Overall, the participants found their method acceptable, as measured by ease of learning, ease of practice, and liking. Comments regarding the Usefulness question in the Progressive group given by several participants were that the method had made them more aware of muscular tension during anger experiences, but that they were unable to release the tension at those times.

## **5 DISCUSSION**

### **5.1 The Study**

This study aimed to investigate the impact of two different relaxation methods on anger management in sufferers of PTSD. The aims were to find out whether relaxation in itself was a useful technique as part of an anger management package; whether there is a difference between the two methods in reducing anger, in acceptability to clients, and in reduction of PTSD symptoms, specifically in the arousal domain.

As can be seen from the results, Hypothesis 1 - that Imaginal Relaxation will be more effective than Progressive Relaxation in reducing anger in PTSD participants - was not borne out. In addition, Hypothesis 2 - that Imaginal Relaxation will be more acceptable as part of an anger management package than Progressive Relaxation - was also not borne out. The Null Hypothesis - that there will be no difference between the two methods - was borne out with remarkably similar subjective ratings between the groups, and no particular differences in objective measures between the groups.

The greatest gains were seen in the IES-R and DASS-str measures, even though the anger management programme did not specifically set out to target any of the other symptoms of PTSD or stress, and even though stress resulting from conflict with management in their jobs; litigation; financial problems; and family conflict were ongoing over the period of the study.

This last finding is the obverse of another study (Cahill et al, 2003) which found that cognitive therapies targeted at PTSD resulted in a concomitant reduction of anger, in the treatment of female assault victims. The cognitive therapies they

used were described as Stress Inoculation Training (SIT), prolonged exposure, or combined treatment. SIT, of course, typically includes relaxation training.

While Ehlers and Clarke (2000) do not specifically mention anger as a threat-control strategy in their cognitive model of PTSD, MacKay et al (2003) describe a two-step model of anger in which stress may lead to a coping strategy in which the painful affect is blocked and discharged through anger. Power and Dalgleish (1997) also mention studies in which anger occurs as a “transfer” of extraneous arousal” (p310) when the person is unaware of the cause of the arousal. They also state that “the appropriateness of anger varies both across and within cultures” (p304). It may well be that the experience of anger is thus experienced as culturally appropriate and may be felt a more acceptable expression of psychological disturbance than anxiety. (Of course, in the cases described in this study, there is also a strong moral justification for the anger in the precipitating events.) Returning to the Ehlers and Clarke model above, a change in the anger response may facilitate change both in the nature of the trauma memory and in the negative appraisal of the trauma and/or its sequelae. This would then explain the reduction in the IES-R scores seen in this study, despite the fact that the focus was on anger reduction rather than an overall reduction in PTSD symptomology.

However, what factors brought about the change in the trauma response is unclear. It may have been the anger management programme or aspects of this; or it may be completely coincidental. The relaxation intervention was only part of the anger management strategy which also included education, cognitive intervention, and physical exercise. The fact that participants generally found relaxation useful and easy to learn and practice might be taken as an indication of its subjective utility, although this cannot be stated with objective confidence.

## 5.2 Limitations of the study

The participants: the participants were not as analogous a group as might be wished. Although most of them sustained the trauma in the course of their occupation, 2 of the participants had sustained the trauma outside of work. While this then had implications for their ability to work, part of the anger of the other participants was towards their workplace management - often justifiably - who they felt had not protected them or supported them. Another major difference was in the length of time between the occurrence of the trauma and starting therapy, with 3 having a gap of over 1 year and may thus be regarded as having chronic PTSD, while the other participants had gaps ranging from 6 weeks to 3 months. A future study might try to have a more similar trauma - therapy interval duration, and focus entirely on trauma sustained in the workplace.

The measures: As noted, despite all participants spontaneously complaining of anger as a major symptom, 3 participants fell into the Normal range of the NAS-tot measure, on assessment. This may be because they had previously been very easy-going, or because they were under-reporting. On the other hand, the NAS norms come from an American population, and have not been standardised for Ireland although normative data in a large British sample have been investigated (Jones et al, 1999). (This is generally a problem in Ireland, with the major distributor of psychological tests stating that none of the questionnaires or tests that they distribute have actually been normed for this country. [ETC Consult,2004]) The NAS has also been extensively used with highly aggressive populations, and while the participants in this study may have acted aggressively on occasion (episodes of "road rage" were described) none had actually become physically aggressive or violent. The results of the NAS

did not seem to give objective verification of subjective reports of anger, and did not appear sensitive to this sample.

While in general scores on the DASS and IES-R seemed to reflect the self-reported and therapist-observed psychological state of the participants, one participant (3), at the last session of the anger-management phase of treatment admitted that he had deliberately under-responded to the first set of these questionnaires as he was under financial pressure to return to work. This emphasises the difficulty of relying on questionnaires as a sole measurement of psychological state.

The physiological measures used may be only crude indicators of physiological arousal. One definite drawback was that no baseline measures were taken, and so the one-off pre- and post- relaxation recordings cannot be interpreted of being indicative of anything at all, without knowing what a normal resting state BP and HR might be for each individual. Porter et al (1999) found no relationship between BP and state or trait anger, using ambulatory BP measurement - i.e. BP was measured every 45 mins over a 24 hour period using a monitor worn by the participants. They quote Suls et al's (1995) meta-analysis of literature pertaining to resting BP as having found that high 'anger-in' (suppressed anger) was associated with higher BP, but

“only in studies assessing blood pressure with a single measurement, a method that tends to be unreliable” (Porter et al, 1999, p2)

The fact that so many participants had a diastolic reading of more than 85 mmHg (equivalent to borderline hypertension) may reflect their actual blood pressure status, or may be attributable to the 'white coat syndrome' - anxiety at

having physiological measures taken. Alternatively, in the absence of any disconfirmatory evidence, it could also be that the participants did not in fact relax during the relaxation condition.

Tarrier et al (2002) in their study assessing psychophysical responses in PTSD using electrodermal measures also found no consistency between the participants' subjective report of symptoms and psychophysiological results.

Another major limitation of this pilot study was the lack of self-monitoring and/or recording. While the majority of the participants had kept general baseline recordings in the interval between the initial assessment session and the first session of this study, it seems that perhaps they did not understand the usefulness (both for the study and for themselves) of these recordings; or perhaps the researcher did not explain it sufficiently. In the absence of this data, it is perhaps futile to comment on the reliability or otherwise of self-recordings, especially of distressing and sometimes shameful mood states.

Lastly, the questionnaire used to gain the ratings of subjective effectiveness, utility, and acceptability of the relaxation method used was very short and one question especially ("would you prefer to learn a different method of relaxation?") gave rise to some confusion.

### **5.3 Implications for Further Studies**

The limitations of the present study outlined above immediately suggest modifications and improvements which could be applied to a larger study. Firstly the coherence of the group of participants could be improved and this

would not be difficult. Yehuda (2003) commenting on the statistics enumerated by Kessler (1995) on different rates of PTSD for different categories of traumatic events, says that

“These statistics suggest that viewing trauma survivors as a homogeneous group and trying to base conclusions that might apply generally to such people may result in imprecise conclusions.”

Given a longer time-scale, it would also be possible to recruit a larger cohort of participants so that any results would be more generalisable, and individual differences minimised. Secondly, with any study using psychophysiological recordings, it may be of importance to take baseline measures. Thirdly, measures of physiological responses ideally would collect data on a number of modalities, not just BP and HR. There are a variety of instruments available to measure galvanic skin response (GSR) or electromyographic levels (EMG), as well as comprehensive and computerised biofeedback instruments which may be more responsive or appropriate to use regarding the participants' physiological state.

Given that the cohort of participants was exclusively male, it may be of interest to carry out a similar study with female participants to investigate any possible gender differences.

A study, relevant to the above points, regarding ambulatory BP (Jacob et al, 1999) found that sleep and posture had the greatest effect on BP and HR. They also found that BP increased for both the 'anxious/annoyed' and 'elated/happy' conditions, relative to their default 'mellow' condition and so concluded that BP responses are “related to the degree of engagement of a mood”. In addition, they found that there was no difference between the 'mellow'

condition and the 'bored/sad' condition. It may therefore be that it would be appropriate to combine cardiovascular recordings with GSR or EMG measures.

An exciting development in the training of relaxation skills is the computer game version (MediaLabEurope, 03; Sharry et al, 2003; McDarby et al, 2003) where the more relaxed the participant the better the game proceeds. The physiological modalities which can be used are GSR, EMG, EEG (electroencephalography), and ECG (electrocardiography). The extent of relaxation learnt can then be assessed by the game level the participant has achieved.

The importance of relaxation as a treatment technique in PTSD is shown by a recent study comparing exposure and cognitive treatments in PTSD which provided relaxation as a placebo found that all groups, including the placebo group, made significant improvements on PTSD symptoms and that this continued to 6-month follow-up (Lovell et al, 2001)

While as noted, the DASS-str and the IES-R appeared to reflect subjective reports, the NAS may be perhaps insensitive in this kind of sample of acute PTSD due mainly to single incidents rather than the multiple incidents one might expect of combat veterans. Fourthly, another questionnaire of at least equal standing with the NAS is the State-Trait Anger Expression Inventory (STAXI; Spielberger, 1983; STAXI-2, Spielberger 1999) may be more suitable. This has been extensively used in many studies, including studies on PTSD, and may be more sensitive to this population. It also has the advantage of measuring suppressed anger as well as expressed anger.

Lastly, as the hypotheses included not just the effectiveness of the relaxation method, but also the acceptability of the method as a measure of difference, it

may be that a more qualitative approach would be useful in investigating the latter.

#### **5.4 Conclusion**

When working with this very specific client group, it is important to remember that Averill's widely quoted 1982 work on anger - quoted in Howells (1998) - states that most anger episodes do not result in violence or even aggression. Howells further states that

“any intervention that has the effect of increasing the sense of subjective well-being.....will tend to reduce the probability of angry aggression” (Howells, 1998, p 303)

The anger response experienced by this client group is often very distressing, causes great upset within their families, can provoke guilt or shame within the individual and can cause a deterioration in social relations.

It is therefore important that we as therapists have access to techniques which are proven to be of use in reducing anger. While the present pilot study was unable to result in any firm conclusions regarding the difference between relaxation methods, it is a field that perhaps deserves further study.



## **Appendix 1**

### **Imaginal Relaxation. Instructions recorded onto audio tape.**

Make yourself as comfortable as you can, sitting or lying down....making sure that your arms are supported, that your head is supported. Close your eyes and concentrate on your breathing, making sure that your breaths are soft gentle and even, not too fast or too slow, not too deep or too shallow. Just normal everyday breathing. If you find your breaths are too fast just slow down the breaths out and the breaths in will look after themselves..... And as you do this, imagine that the air you're breathing in has a colour..... a nice colour..... like pantomime smoke, and as you breathe in this nice coloured air..... imagine it swirling down through your nose and mouth ..... down through your throat and into your lungs..... and maybe while it's there it can pick up some tension from your body .....so that when you breath out, maybe it has changed colour, maybe it's gone a bit murky..... and with each breath out, maybe you can begin to feel a little bit more comfortable, a little bit more relaxed..... and as you do this I'd like you to imagine a place, somewhere warm,.....somewhere comfortable..... somewhere you won't be disturbed..... it could be lying on a beach or..... in front of a fire at home..... and just take a moment to picture the place as fully as you can.....everything you can see there.....everything you can hear there..... any sounds or sights or smells..... and above all the position you'd be in there..... and imagine above all that feeling of warmth,.....feeling warm all over, warm right through.....and as you feel that feeling I'd like you to imagine that all the tension in your muscles is dissolving and flowing down through you.....down from your head, down through your forehead,.....leaving your eyebrows maybe feeling heavy, your eyelids feeling heavy..... and the wave of tension flowing down through your cheeks so that your jaws can relax and your lips might part..... and the wave flowing down,.....down through your neck.....down through your shoulders so that your shoulders might pull down a little..... and this wave flowing down, through your upper arms .....down through your forearms .....and flowing out your fingertips like out of little taps.....and the wave continues down

through your neck and shoulders down through your chest and back,..... down through your stomach and bottom .....down through your legs, down through your calves.....and out your toes like out of little taps.....leaving your whole body feeling warm and floppy, loose and limp.....and I don't know whether each time you practice this, you'll find that that feeling comes more quickly or more easily or more intensely..... you can only know by trying this..... and now I'd like you just to enjoy the feeling and stay with it.....

.....but all good things come to an end..... and what I'd like you to do now..... is to concentrate on your breathing again..... this time doing a countdown in time with your breathing.....a countdown from 10 to 0..... silently... in your head..... each breath out counting as one..... and as you go through the countdown.....you'll begin to notice noises around you..... become aware of the desire to move..... and by the time you get to zero..... you'll feel ready to open your eyes, and stretch..... and be alert again.....but bringing that feeling with you.....

Instructions for Imaginal Relaxation based on hypnosis technique, Aldon P (1992)

## **Appendix 2**

### **Progressive Relaxation. Instructions recorded onto audio tape.**

Please make yourself comfortable, sitting in a chair. Now when you're ready, clench your right fist, feeling tension in the fist and forearm - hold it.. hold it... and let go .....

bend your elbow and tense your biceps, keeping the hands relaxed..... - hold it.. hold it... and let go .....

straighten the arm and tense the triceps leaving your lower arm supported by the chair with the hands relaxed, feel it , hold it, and let go.....

wrinkle your forehead by raising your eyebrows, hold it, hold it, and let go.....

bring your eyebrows close together like frowning and hold it..... and let go....

screw up the muscles around your eyes as if you wanted to close your eyes tightly, hold it, hold it, .....and relax.....

tense your jaw by biting your teeth together.....hold it, hold it, and let go.....

press your tongue hard and flat against the roof of your mouth with your lips closed, notice the tension in your throat.....hold it, hold it, and let go.....

press your lips tightly together as if you were pouting.....hold it, hold it, and let go.....

push your head back as far as it'll go against the chair.....hold it, hold it, and let go.....

press your chin down onto your chest ...hold it, hold it, and let go.....

hunch your shoulders up towards your ears.....hold it, hold it, and let go.....

hunch your shoulders up again and now circle your shoulders....hold it, hold it, and let go.....

breathe calmly and regularly with your stomach - as you breathe in, your stomach should go out..... take a deep breath, completely filling your lungs and hold the breath for a few seconds and then just let it go slowly.....

tense your stomach muscles... hold it, hold it, and let go.....

pull your stomach in, hold it, hold it, and let go.....

arch your lower back away from the chair, hold it, hold it, and let go.....

tense your buttocks and calves by pressing your heels into the floor keeping your legs straight.....hold it, hold it, and let go.....

tense your calves again by pressing your feet and toes down on the floor...hold it, hold it, and let go.....

tense your shins by pulling your toes up and backward.....hold it, hold it, and let go.....

Just notice the feeling of having let go throughout your body..... notice if there is any tension in your body anywhere and let go.....

Instructions for Progressive Relaxation based on Öst, given in Hawton,  
Salkovskis et al (Eds) 1989

## Appendix 3a

### Novaco Anger Scale-sample

(Novaco 2003)  
©WPS, LosAngeles

The statements in Part A describe things that people sometimes think, feel, and do. How true are they for you? For each statement, indicate whether it is (1) never true, (2) sometimes true, or (3) always true. Circle the number that best describes how true the statement is for you.

- 1 2 3 .....1. When something is wrong is done to me, I am going to get  
angry
- 1 2 3 .....2. Once something makes me angry, I keep thinking about it.
- 1 2 3 .....3. Every week I meet someone I dislike.
- 1 2 3 .....4. I know that people are talking about me behind my back.
- 1 2 3 .....5. When something makes me angry, I put it out of my mind and  
think of something else.
- 1 2 3 .....6. Some people would say I am a hothead.
- 1 2 3 .....7. My muscles feel tight and wound-up.
- 1 2 3 .....8. When I get angry, I stay angry for hours.
- 1 2 3 .....9. I walk around in a bad mood.
- 1 2 3 ....10. If I feel myself getting angry, I can calm myself down.
- 1 2 3 ....11. My temper is quick and hot
- 1 2 3 ....12. When someone yells at me, I yell back at them.
- 1 2 3 ....13. I have had to be rough with people who bother me.
- 1 2 3 ....14. I feel like smashing things
- 1 2 3 ....15. When I am frustrated by a problem, I try to find a solution.
- 1 2 3 ....16. I get angry because I have a good reason to be angry.
- 1 2 3 ....17. I can't sleep when something wrong has been done to me
- 1 2 3 ....18. If I don't like someone, it doesn't bother me to hurt their  
feelings.

## Appendix 3b

### Impact of Events Scale -Revised - sample

**Instructions:** The following is a list of difficulties people sometimes have after stressful life events. Please read each item, and then indicate how distressing each difficulty has been for you during the past 7 days with respect to \_\_\_\_\_.

How much were you distressed or bothered by these difficulties?

Not at all	A Little bit	Mod- erately	Quite a bit	Ex- treme -ly
------------------	--------------------	-----------------	-------------------	---------------------

Any reminder brought back feelings about it.

I had trouble staying asleep

Other things kept making me think about it.

I felt irritable and angry

I avoided letting myself get upset when I thought about it or was reminded about it

I thought about it when I didn't mean to.

I felt as if it hadn't happened or wasn't real

I stayed away from reminders about it

Pictures about it popped into my mind.

I was jumpy and easily startled

I tried not to think about it

I was aware that I still had a lot of feelings about it, but I didn't deal with them.

My feeling about it were kind of numb.

I found myself acting or feeling like I was back

## Appendix 3c

### DASS (21Q - Short version) sample

(Lovibond & Lovibond,1996)

NAME: \_\_\_\_\_

DATE: \_\_\_\_\_

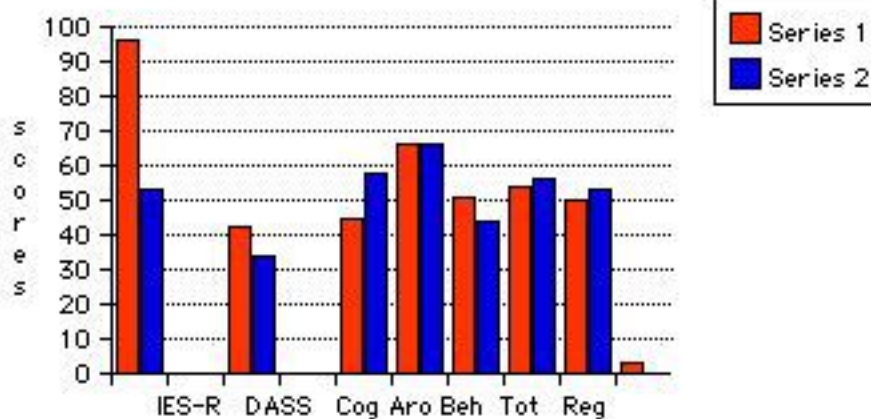
For each of the statements below, please circle the number which best indicates how much the statement applied to you OVER THE PAST WEEK. There are no right or wrong answers. Do not spend too much time on any one statement.

- 0 - Did not apply to me at all
- 1 - Applied to me to some degree, or some of the time
- 2 - Applied to me a considerable degree, or a good part of the time
- 3 - Applied to me very much, or most of the time

- 0 1 2 3 I felt downhearted and blue
- 0 1 2 3 I found it hard to wind down
- 0 1 2 3 I was aware of the action of my heart in the absence of physical exertion ( e.g. sense of heart rate increase, heart missing a beat)
- 0 1 2 3 I found it difficult to relax
- 0 1 2 3 I was aware of dryness of my mouth
- 0 1 2 3 I felt that I had nothing to look forward to
- 0 1 2 3 I felt that I was using a lot of nervous energy
- 0 1 2 3 I experienced breathing difficulty (e.g. excessively rapid breathing, breathlessness in the absence of physical exertion)
- 0 1 2 3 I felt that life was meaningless
- 0 1 2 3 I experienced trembling (e.g in the hands)
- 0 1 2 3 I felt I wasn't worth much as a person
- 0 1 2 3 I found myself getting agitated
- 0 1 2 3 I was worried about situations in which I might panic and make a fool of myself

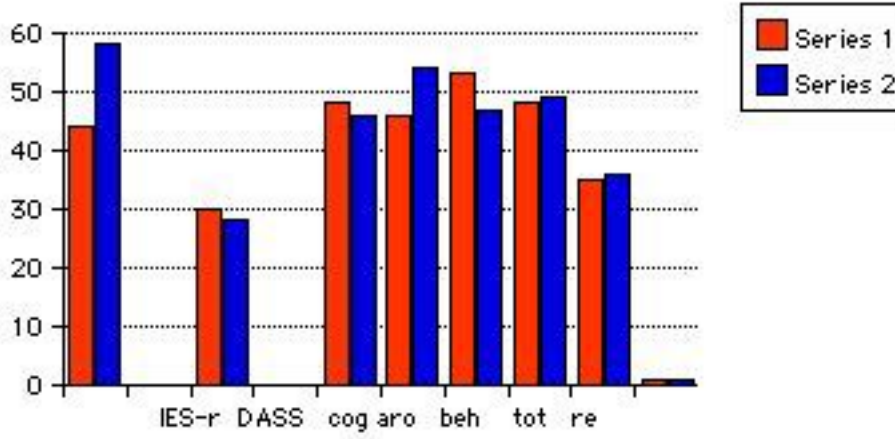
# Appendix 4: Questionnaire scores changes by participant

Participant 1, Before & After Measures

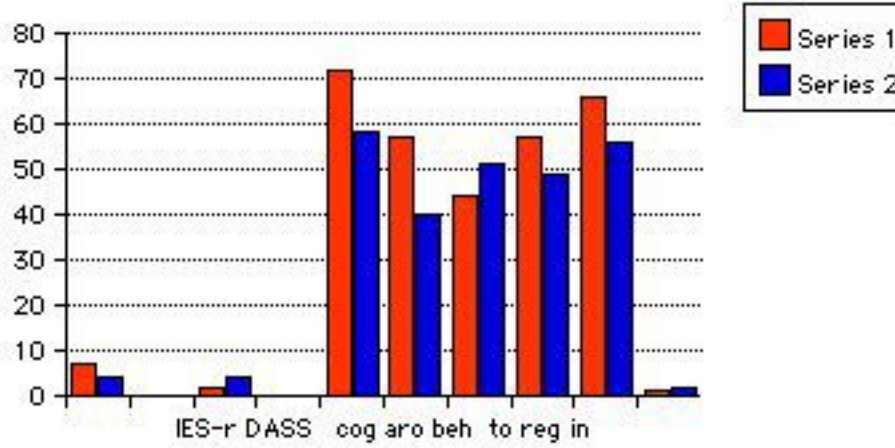


Series 1 = First Session; Series 2 = Last Session

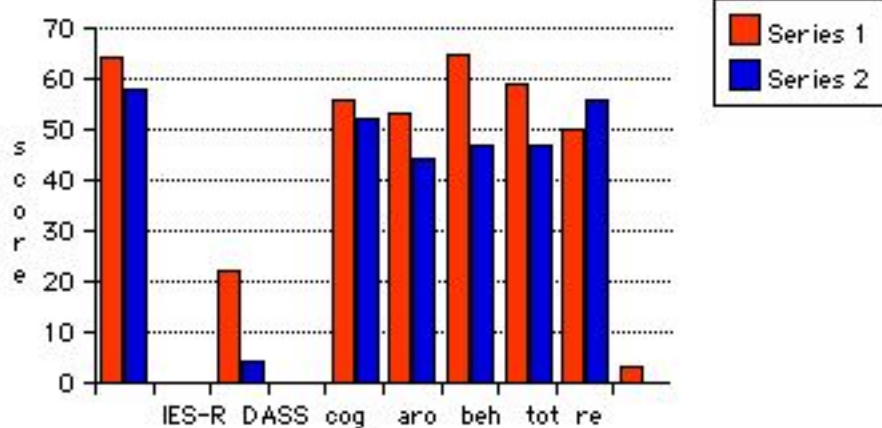
2 - Before & After Q'aire Scores



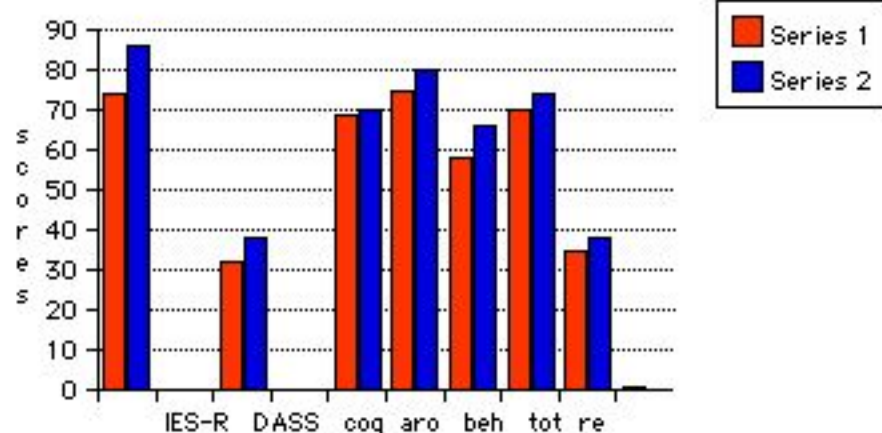
3 - Before & After Q'aire Scores



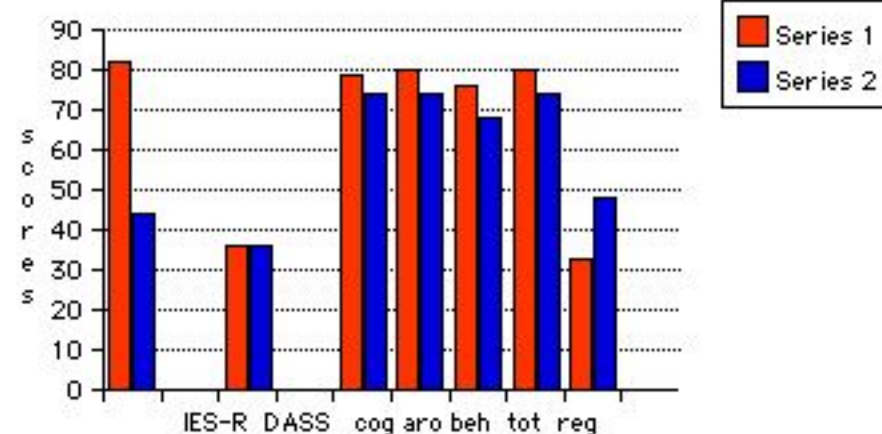
4 - Before &amp; After Scores on Q'aires



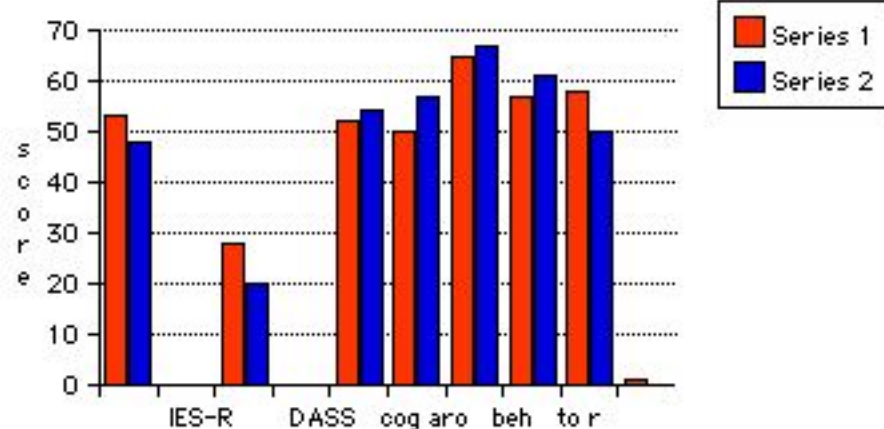
5- Before &amp; After Q'aire Scores



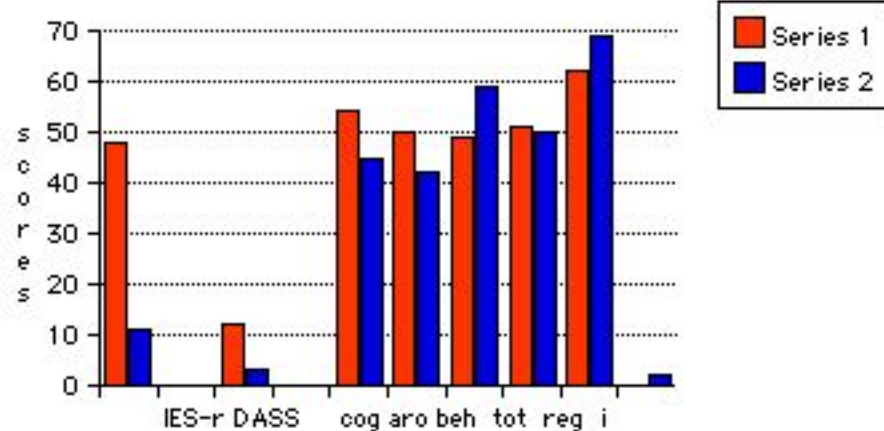
6 - Before &amp; After Q'aire Scores



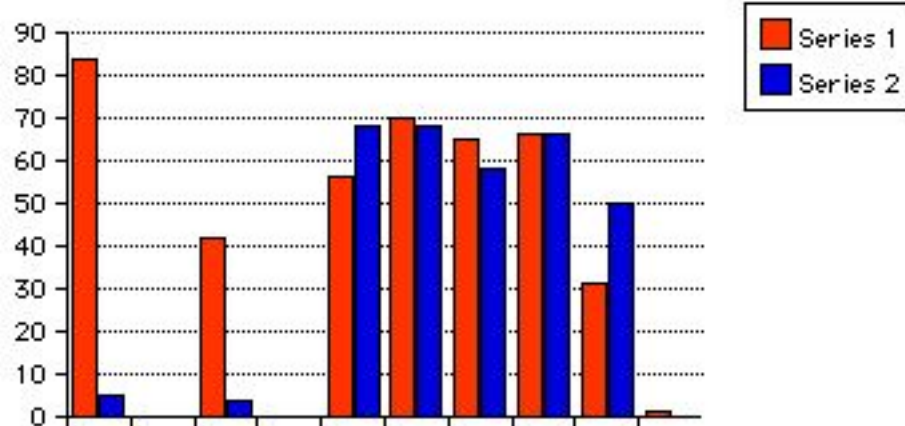
7- Before & After Q'aire Scores



8 - Before & After Q'aires



10 - Before & After Q'aire Scores



Series 1 = First Session; Series 2 = Last Session

## Appendix 5

### Participant's consent form.

I consent to my data being used in a study to be carried out by Fionnula MacLiam. This study has been described to me in the leaflet "Information Regarding the Research Project" which I have read. I am aware that I may withdraw my consent at any time. I know that my personal information will remain confidential, and am aware and that the finished study will be lodged in the library of the University of Derby.

Name: \_\_\_\_\_

Signed: \_\_\_\_\_

Date: \_\_\_\_\_

This agreement has been discussed with me by

\_\_\_\_\_

on \_\_\_\_\_

Copy to client

Copy to file

## **Appendix 6            INFORMATION regarding the research project.**

I am doing a research project as part of the requirements of the MSc in Cognitive Behavioural Psychotherapy, which I am undertaking at the University of Derby this year.

The project itself is about comparing two different sorts of relaxation exercise, in the management and reduction of anger as experienced as part of the constellation of symptoms of Post Traumatic Stress Disorder.

In order to do this, I will be assigning people at random to one of the two relaxation methods. I will record your heart rate (pulse) and blood pressure, before and after the relaxation during sessions at the office. I will do this on 3 occasions:

- 1        the first time we do the relaxation exercise
- 2        after you have been practicing the relaxation at home for two weeks
- 3        and for the final time, two weeks after that (i.e. after four weeks home practice)

These measurements will help determine the physical effects of the relaxation. In addition to this, I will ask you to complete some psychological questionnaires to determine your anger levels on the first and third occasions.

The data that results will be used in the study. Your own particular details will remain confidential and you yourself will not be identified in the study. I will be discussing the progress of the research with my University supervisor, but again, you yourself will not be identified in these discussions. The research will be read by my supervisor at the University of Derby and an external examiner from another University.

I anticipate that the research and the study will be completed by June 2004. If you have any questions about the study, you can ask me and I will be happy to answer. If you would like to see a copy of the completed research, I will arrange this for you.

## **Appendix 7**

### **details of physiological measuring device**

Electronic wrist blood pressure and pulse measurement device, the MBO OSC Compact 550 made by MBO International Electronic GmbH Göschitzer Str 36 D-07745 Jena, Germany

## **Appendix 8**

### **Relaxation Practice Records**

Please keep a record of all the times you practice relaxation. This should be THREE times a day.

DATE	Comment	Practice session no. 1	2	3
------	---------	------------------------	---	---

## **Appendix 8**

### **Relaxation Practice Records**

Please keep a record of all the times you practice relaxation. This should be THREE times a day.

DATE	Comment	Practice session no. 1	2	3
------	---------	------------------------	---	---

## Appendix 9

### Anger Episodes Recording Sheet

Anytime you find yourself getting annoyed, irritated or angry, please fill in the record below.

Anger Scale:

-----  
0 1 2 3 4 5 6 7 8 9 10  
none  
extremely

Date	Time	What happened to spark you off?	Intensity	Duration
------	------	---------------------------------	-----------	----------



## **Appendix 11**

### **Brief description of participant characteristics**

#### **Participant 1**

Age 50, computer technician, assaulted by coach driver abroad two and a half years prior to assessment. Sustained minor back injuries.

#### **Participant 2**

Age 39, policeman, shot at at close range by shotgun 14 months prior to assessment, no physical injuries. He was the subject of internal investigations throughout the period of treatment and also had to act as witness in court for the hearing of the shooting incident.

#### **Participant 3**

Age 36, bus driver, assaulted by passenger with bottle 3 months prior to assessment, minor physical injuries.

#### **Participant 4**

Age 28, bus driver, assaulted by passenger during a racist harangue which ensued after a fare dispute. Minor physical injuries. Verbal racist attacks and occasional physical attack had been a continuous feature of his workplace experience.

#### **Participant 5**

Age 50, ticket seller at train station, held up in armed robbery 6 weeks prior to assessment. Previously also abducted by armed raiders 2 years before and held in boot of car for 4 hours. Minor physical injuries. Disputes with management were ongoing during the treatment period, regarding implementation of Health and Safety procedures at his workplace.

**Participant 6**

Age 42, bus driver, confrontation with drunk passenger 6 weeks prior to assessment - verbal abuse and physical threats but no assault. Previously experienced a long series of similar incidents.

**Participant 7**

Age 33, train ticket inspector, assaulted with Stanley knife when removing passenger for smoking 8 weeks prior to assessment. Two years previously had been bitten on leg in physical altercation with a drug addict at railway station.

**Participant 8**

Age 40, bus driver. Involved in road traffic accident two and a half years before assessment. Major physical injuries including broken hip, neck and chest injuries. Litigation was ongoing throughout the treatment period, with court dates being adjourned.

**Participant 9**

Age 23, bus driver. Had come upon a major accident involving a bus in which 5 people died, including those trapped under the bus, 2 months before assessment.

**Participant 10**

Age 42, train driver, suicide on line 3 months prior to assessment. Corpse was decapitated and he almost stood on head when he alighted from cab. Three previous near misses in last 10 years, including hitting a car on the line.

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