

**PATTERNS OF REDUCTION OF DISTRESS
IN CLINICAL CONDITIONS USING
EYE MOVEMENT DESENSITISATION AND REPROCESSING (EMDR)**

BRIGITTE BODILL

**Masters Social Science (Psych) cum laude, Bachelor Social Science Honours (Psych) cum
laude, Bachelor Social Science (Psych) summa cum laude, Chartered Psychologist
(British Psychological Society), Qualification in Counselling Psychology (British
Psychological Society), Counselling Psychologist (Health Professions Council, UK)**

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DECLARATION

I declare that this thesis, “Patterns of reduction of distress in clinical conditions using eye movement desensitisation and reprocessing (EMDR)”, is my own work and that all sources used or quoted have been indicated and acknowledged by means of complete references.

B Bodill

Swindon, UK

September 2009

DEDICATION

- To my loving husband Chris for his unconditional support throughout this study.
- To my parents, who always encouraged me to do my best and to my father who valued learning.

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ABSTRACT

This study investigated the patterns of reduction of distress in clinical personality patterns, severe personality patterns, depressive constructs, other clinical syndromes, severe clinical syndromes and dissociation following EMDR treatment. Thirty-two people, ranging from 23 to 65 years old, underwent the full EMDR protocol treatment for up to three traumas.

The findings regarding clinical personality patterns revealed that EMDR is most effective in reducing the symptoms of dependent personality pattern because 76% of participants with clinically significant dependent personality pattern before EMDR treatment no longer had a clinically significant score (>75) on the MCMI-III at the end of EMDR treatment; compared to 75% with masochistic personality pattern, 77% with negativistic personality pattern, 69% with avoidant personality pattern, 40% with depressive personality pattern and 29% with schizoid personality pattern. These gains were maintained on the MCMI-III at follow-up by 76% with dependent personality pattern, 64% with masochistic personality pattern, 46% with negativistic personality pattern, 38% with avoidant personality pattern, 30% with depressive personality pattern and 29% with schizoid personality pattern.

The analysis of the severe personality patterns at the end of EMDR treatment revealed that the scores on the MCMI-III reduced from within one standard deviation above the mean (60-74) to below the mean (<60) for 84% of participants with borderline personality pattern, compared to 68% with paranoid personality pattern and 52% with schizotypal personality pattern. These gains were maintained on the MCMI-III at follow-up by 84% with borderline personality pattern, 68% with paranoid personality pattern and 48% with schizotypal personality pattern.

The analysis of the depressive constructs revealed that EMDR is most effective in reducing symptoms of major depression as 86% of participants with clinically significant major depression before EMDR treatment no longer had a clinically significant score (>75)

on the MCMI-III at the end of EMDR treatment; compared to 73% with dysthymia and 40% with depressive personality pattern. These gains were maintained on the MCMI-III at follow-up by 86% with major depression, 58% with dysthymia, and 33% with depressive personality pattern.

The findings regarding the other clinical syndromes revealed that 91% of participants with clinically significant post traumatic stress before EMDR treatment, no longer had a clinically significant score (>75) on the MCMI-III at the end of EMDR treatment, compared to 75% of participants with anxiety. These gains were maintained on the MCMI-III at follow-up by 91% of participants with post traumatic stress and 69% of participants with anxiety.

The analysis of the severe clinical syndromes at the end of EMDR treatment revealed that the scores on the MCMI-III reduced from within one standard deviation above the mean (60-74) to below the mean (<60) for 78% of participants with delusional disorder, compared to 67% with thought disorder, 32% with bipolar (manic), 28% with alcohol dependence and 28% with drug dependence. These gains were maintained on the MCMI-III at follow-up by 67% of participants with delusional disorder, compared to 63% with thought disorder, 53% with bipolar (manic), 48% with alcohol dependence and 57% with drug dependence.

The analysis of the effects of EMDR on dissociation revealed that there was a significant decrease in symptoms of dissociation on the DES at the end of EMDR treatment and these gains were maintained at the follow-up measurement at the end of the study.

Whilst the findings of the present study cannot be generalised due to the small sample size, the findings do suggest that EMDR is successful in the treatment of a number of clinical conditions in addition to post traumatic stress; with further research being strongly indicated in order to further explicate the efficacy of EMDR across different psychiatric conditions.

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Chapter 1: Introduction

1.1 Orientation

Eye movement desensitization and reprocessing (EMDR) is a model of psychological therapy that was developed by Francis Shapiro (2001). It is recognised by the National Institute of Clinical Excellence (NICE) in the United Kingdom as an excellent form of treatment for post traumatic stress disorder. While EMDR is one of the most well researched forms of psychological treatment, to date there have been few empirical research studies into the effects of EMDR on personality disorders, depressive constructs and severe clinical syndromes.

Shapiro (2001) developed the model of EMDR treatment after a chance encounter in a park when she noticed that her rapid eye movements reduced the emotional disturbance she was experiencing. Interested if the movement of eyes did reduce disturbance, she conducted a controlled research study in which participants were assigned to either EMDR or a modified flooding procedure. The participants had been either raped, molested or were combat veterans. Participants reported improvements in their subjective unit of disturbance (SUD), where zero represents no disturbance while ten represents the worst possible disturbance. Shapiro (1989a, 1989b) published the results of her research, which showed a rapid reduction in emotional disturbance when eye movements were used in conjunction with disturbing material. Since then Shapiro (2001) has developed EMDR into an eight phase therapeutic model of psychological therapy.

There were many who were sceptical of Shapiro's claims and, as a result, the EMDR model of treatment has come under considerable scrutiny in a number of randomised control studies. These mainly compared EMDR treatment with components of cognitive behaviour therapy (CBT), which was already established as an effective treatment for post traumatic stress (Jensen, 1994; Vaughan, Armstrong, Gold, O'Connor, Jenneke, & Tarrier, 1994;

Marcus, Marquis and Sakai, 1997; Rothbaum, 1997; Carlson, Chemtob, Rusnak, Hedlund, and Muraoka, 1998; Scheck, Schaeffer, & Gillette, 1998; Devilly & Spencer, 1999; Ironson, Freund, Strauss, & Williams, 2002; Lee, Gavriel, Drummond, Richards, & Greenwald, 2002; Power, McGoldrick, Brown, Buchanan, Sharp, Swanson & Karatzias, 2002; Taylor, Thordarson, Maxfield, Fedoroff, Lovell, & Ogrodniczuk, 2003; Rothbaum, Astin, & Marsteller, 2005). As a result of the scrutiny, EMDR has become one of the most well researched psychological treatments for post traumatic stress, and is now recommended as one of the treatments of choice for post traumatic stress in a number of countries, including France, Ireland, Israel, Netherlands, United Kingdom and the United States of America (Bleich, Kotler, Kutz, & Shalev, 2002; CREST, 2003; Dutch Steering Committee Guidelines Mental Health Care, 2003; American Psychiatric Society, 2004; Department of Veterans Affairs & Department of Defence, 2004; INSERM, 2004; NICE UK, 2005).

While the effects of EMDR on post traumatic stress have been vigorously researched, to date there have been no randomised control studies that have studied the effects of EMDR treatment on depressive symptoms (Maxfield, 2007). The analysis of the effects of EMDR treatment on depressive symptoms has generally been secondary in the studies of post traumatic stress. The studies that have analysed the reduction in depression in EMDR research have generally used the Beck Depression Inventory (BDI) to measure the change in depression (Beck & Steer, 1993; Marcus et al. 1997; Rothbaum, 1997; Scheck et al. 1998; Carlson et al. 1998; Edmonds, Rubin, & Wambach, 1999; Devilly & Spencer, 1999; Power et al. 2002; Ironson et al. 2002). The lack of studies on the efficacy of EMDR treatment with different types of depression, possibly reflects the difficulties in the current debate on the establishment of separate identities of depressive constructs that share descriptive similarities, in particular dysthymia and depressive personality disorder (Akiskal, 1983; Hirschfeld, 1994; Huprich, 1998; Bagby & Ryder, 1999; Klein, 1999; Phillips & Gunderson, 1999; Ryder &

Bagby, 1999; Widiger, 1999; Huprich, 2001; Ryder, Bagby, & Dion 2001; Ryder, Bagby & Schuller, 2002; Bagby, Ryder & Schuller, 2003; Ryder, Schuller & Bagby, 2006). While acknowledging that there are difficulties in the identification of these constructs, one of the primary aims of this research study was to study the effects of EMDR treatment on different kinds of depressive constructs. This was made possible by using the Millon Clinical Multiaxial-III (MCMI-III) psychometric assessment as a measurement tool, as it provides a measure of three different constructs of depression, namely major depression, dysthymia and depressive personality.

Like the study of the effects of EMDR on depressive symptoms, most of the research on the reduction of anxiety using EMDR has also been secondary in the EMDR studies of post traumatic stress (Vaughan et al. 1994; Marcus et al. 1997; Rothbaum, 1997; Scheck et al. 1998; Carlson et al. 1998; Edmonds et al. 1999; Devilly & Spencer, 1999). Most of these studies have used the State-Trait Anxiety Inventory (STAI). State anxiety is seen as a current transitory emotional condition or how a person feels 'right now' and trait anxiety is seen as a relatively stable state of anxiety or how the person feels 'generally' (Spielberger, Gorsuch, Luchene, Vagg, & Jacobs, 1983). There have also been a few studies into the effects of EMDR treatment with panic attack disorder, but no significant changes on the cognitive measures and in the frequency of panic attacks were found (Goldstein, de Beurs, Chambless, & Wilson, 2000) and the gains dissipated by follow-up (Feske & Goldstein, 1997). There have been a number of studies that investigated the effect of EMDR treatment with phobias (Foley & Spates, 1995; Muris & Merkelbach, 1997; Muris, Merkelbach, Holdrinet, & Sijtsenaar, 1998) and results tend to indicate that EMDR treatment may be more effective in reducing the disturbance of a phobia if it is preceded by a traumatic event, such as a distressing dental experience, compared to a phobia with no known onset, such as a fear of

snakes (De Jongh & ten Broeke, 2007). One of the aims of this study was to investigate the effects of EMDR treatment with anxiety as measured on the MCMI-III.

To date there have been no research studies that have systematically investigated the effect of EMDR treatment on severe clinical syndromes and dependence disorders. The MCMI-III provides three severe clinical syndromes scales, namely, bipolar (manic), thought disorder and delusional disorder. The MCMI-III also provides measurements on two dependence scales, namely, alcohol and drug dependence. Even though none of the participants in this study had clinically significant severe clinical syndromes and dependence disorders before EMDR treatment, one of the aims of this study will be to analyse the results of the severe clinical syndromes and dependence disorder scales on the MCMI-III as the results may provide an indication of how these conditions may respond to EMDR treatment.

In the adaptive information processing model, Shapiro (2007, p. 5) postulated that a comprehensive psychological reorganisation may occur in EMDR treatment, which may be reflected by changes in 'personality characteristics'. While Shapiro (2007) postulates that changes occur in the personality structure of people following EMDR treatment, to date few systematic studies have been conducted to establish whether this is so. Therefore one of the aims of this research study was to investigate the effect of EMDR treatment on clinical personality patterns: schizoid, avoidant, depressive, dependent, histrionic, narcissistic, antisocial, sadistic (aggressive), compulsive, negativistic (passive-aggressive), and masochistic (self-defeating), as measured by the MCMI-III. The participants in this research study may have a variety of clinically significant personality patterns before EMDR treatment, and the effectiveness of EMDR treatment on these personality patterns on the MCMI-III will be analysed.

In addition, there have been few studies that have systematically studied the effect of EMDR treatment on severe personality patterns, possibly because of the amount of

preparation needed to build up the resources of a person before beginning the bilateral stimulation in EMDR treatment. Brown and Shapiro (2006) outlined a case study of a woman with borderline personality disorder who presented with a complex history of a variety of trauma. After undergoing EMDR treatment, which included six sessions of preparation and 15 sessions of eye movements, a number of clinically significant changes in affect control, personal management, identity disturbance and interpersonal relating were reported one year later. One of the aims of the current research study was to investigate the effects of EMDR treatment on severe clinical syndromes bipolar, thought disorders, and delusional disorders on the MCMI-III. Even though none of the participants will have clinically significant severe personality patterns before EMDR treatment, one of the aims of this study was to analyse the results of these severe personality pattern scales on the MCMI-III as the results may provide an indication of how these conditions may respond to EMDR treatment.

Another area of interest is the effects of EMDR treatment on dissociation. Previous research has investigated the effects of EMDR treatment on dissociation but this has been a secondary measure in EMDR studies of post traumatic stress (Rothbaum et al. 1997; Taylor et al. 2003; Rothbaum et al. 2005). These studies have reported that there has been a significant decrease in dissociation with EMDR treatment (Rothbaum et al. 1997; Taylor et al. 2003; Rothbaum et al. 2005). One of the aims of this research study was to investigate the change in dissociation following EMDR treatment, and to see if the results of this study are consistent with the findings of other studies.

The rest of this chapter will outline the motivation, aim, and the hypotheses of this research study. The chapter will also provide definitions of terms and outline the organisation of the study.

1.2 Motivation for the study

EMDR treatment has undergone more empirical research than any other psychological therapy. The research on the effectiveness of EMDR treatment to date has established that EMDR treatment is effective in significantly reducing the symptoms of post traumatic stress. The effectiveness of EMDR treatment in reducing symptoms of depression, anxiety and dissociation has been secondary measures in EMDR studies of post traumatic stress. In addition, there have been few systematic studies of the effects of EMDR on personality patterns.

The research study was motivated to investigate the effect of EMDR treatment on clinical personality patterns, severe personality patterns, depressive constructs, other clinical syndromes, severe clinical syndromes and dissociation. The clinical personality patterns under investigation in this research study are schizoid, avoidant, depressive, dependent, histrionic, narcissistic, antisocial, sadistic (aggressive), compulsive, negativistic (passive-aggressive), and masochistic (self-defeating) as measured by the MCMI-III. The severe personality patterns under investigation in this research study are schizotypal, borderline and paranoid as measured by the MCMI-III. The depressive constructs under investigation are major depression, dysthymia and depressive personality on the MCMI-III. The other clinical syndromes under investigation are post traumatic stress and anxiety, and the severe clinical syndromes under investigation are bipolar, thought disorder, delusional disorder, and alcohol and drug dependence on the MCMI-III. Lastly the effect of EMDR treatment on dissociation on the DES-II will also be investigated.

1.3 Aims of the study

The aim of this research study was to establish the effectiveness of EMDR treatment in reducing clinical personality patterns [schizoid, avoidant, depressive, dependent, histrionic,

narcissistic, antisocial, sadistic, compulsive, negativistic, and masochistic] and severe personality patterns [schizotypal, borderline and paranoid] on the MCMI-III. Another aim of the study was to establish the effectiveness of EMDR treatment in reducing the symptoms of depressive constructs [major depression, dysthymia and depressive personality pattern], other clinical syndromes [post traumatic stress and anxiety], and severe clinical syndromes [bipolar, thought disorder, delusional disorder, and alcohol and drug dependence] on the MCMI-III. Another aim of this study was to establish the effectiveness of EMDR treatment in reducing dissociation on the DES-II.

1.4 Hypotheses

1. The null hypotheses of this study states that EMDR treatment does not lead to significant changes in:
 - a. MCMI-III scores for:
 - i. Personality patterns (schizoid, avoidant, dependent, narcissistic, sadistic, compulsive, histrionic, negativistic and masochistic);
 - ii. Severe personality patterns (borderline, schizotypal, and paranoid);
 - iii. Depressive constructs (major depression, dysthymia and depressive personality);
 - iv. Other clinical syndromes (post traumatic stress and anxiety);
 - v. Severe clinical syndromes (bipolar, thought disorder, delusional disorder, and alcohol and drug dependence).
 - b. DES-II scores for dissociation.
2. This study also hypothesized that significant EMDR treatment effects as measured by the MCMI-III and DES-II are not maintained at follow-up.

1.5 Definitions of terms

EMDR stands for Eye Movement Desensitization and Reprocessing. EMDR is a comprehensive psychological treatment that was developed by Francine Shapiro which uses eye movements and has proven to be an effective treatment for post traumatic stress. It is one of the most well researched psychological treatments.

NHS stands for the National Health Service in the United Kingdom (UK). This healthcare services in the UK is a publicly funded system that is based on the premise that healthcare should be available to everyone regardless of the income of a person. The NHS is therefore free at the point of delivery and is designed to offer healthcare based on clinical needs.

NICE stands of the National Institute for Clinical Excellence and is an independent organisation created by the UK government in 1999. The organisation investigates all the current research and decides what treatment should be available on the NHS in England and Wales. The aim of NICE is to ensure people across England and Wales have access to the same treatment.

Primary Care is a term used in the NHS to describe a health provider who provides the first point of contact for patients. Primary care offers a wide range of services to the general public. In the field of psychological therapy, primary care tends to offer treatment to the less severe spectrum of psychological difficulties.

Secondary Care is a term used in the NHS that refers to health providers who offer specialist care to patients, such as clinical psychologists and psychiatrists. In order to receive specialist care, patients need to be referred by a primary care provider who decides whether the condition warrants a referral to secondary care or not.

The first measurement is a term used in this research study to refer to the measurement taken before EMDR treatment.

The second measurement is a term used in this research study to refer to the measurement taken after the treatment of one trauma using EMDR.

The last measurement is a term used in this research study to refer to the measurement taken at the end of the EMDR treatment. For some participants the last measurement occurs after the treatment of multiple traumas using EMDR, while for other participants the last measurement refers to the measurement after the treatment of a single trauma.

The follow-up measurement is a term used in this research study to refer to the measurement taken at the end of the research study to see if the gains were maintained after treatment. The follow-up period ranges from six months to 36-months depending on when the participant completed their EMDR treatment in relation to the end of the research study.

1.6 Organisation of the study

Chapter one provides the motivation and aims of this research study and places it in context. It also outlines the research hypotheses and the organisation of the study.

Chapter two outlines what EMDR treatment is, the nature of traumatic memory, the theoretical model of EMDR, and the theories of psychological and neurobiological mechanisms of change in EMDR.

Chapter three provides an outline of the research that has been conducted into the effects of EMDR on post traumatic stress, depression, and anxiety disorders, including generalised anxiety, panic disorders and phobias. The chapter also outlines the research that has been conducted into the effects of EMDR on personality disorders, dissociation and the number of treatment sessions used in EMDR treatment.

Chapter four describes the research design, including the motivation for the study, the aims, hypotheses, methodology, sample, criteria, procedure and the measurement for this research study.

Chapter five provides a detailed quantitative statistical analysis of the data obtained. The analysis of the data includes an analysis of participant demographic, an analysis of the data after the treatment of one trauma; an analysis of the data between the first measurement before EMDR treatment and the last measurement at the end of EMDR treatment or after the treatment of multiple traumas; an analysis of the data between the first measurement before EMDR treatment and the follow-up measurement at the end of the research study; and an analysis of the data between the last measurement at the end of the EMDR treatment and the follow-up measurement at the end of the research study.

Chapter six provides a comprehensive qualitative discussion of the results obtained in the statistical analysis.

Chapter seven outlines the conclusions of this study and the recommendations for future research into the effects of EMDR treatment on clinical personality patterns, severe personality patterns, depressive constructs, other clinical syndromes, severe clinical syndromes and dissociation. The benefits of this research study are also discussed.

1.7 Summary

This chapter outlined the research study that will be undertaken into the effects of EMDR treatment on clinical personality patterns, severe personality patterns, depressive constructs, other clinical syndromes, severe clinical syndromes and dissociation. It described the motivation and aims of the study, and outlined the design of the research. This chapter also outlined the organisation of this research study.

Chapter 2: What is EMDR?

This chapter will provide a brief overview of eye movement desensitisation and reprocessing (EMDR). It will discuss the model of EMDR and the adaptive information processing theory that underpins the EMDR model of treatment. The chapter will also discuss the nature of traumatic memories and how these are affected by EMDR. Lastly, the proposed psychological and biological mechanism of actions in EMDR treatment will be discussed.

2.1 The EMDR model

Eye movement desensitisation and reprocessing (EMDR) is a model of psychological therapy that was developed by Francine Shapiro (2001) after a chance encounter in a park. She explains that she was at a particularly vulnerable time of her life, after she had been diagnosed with cancer. One day while walking in the park, she noticed that she felt better. Paying attention to what was happening she noticed that her eyes moved rapidly from side to side. Wondering if eye movements did make her feel better, she induced these eye movements and noticed a reduction in her disturbance. Interested if the movement of eyes really did reduce disturbance, she embarked on a study which reported a rapid reduction in disturbance when eye movements were used in conjunction with disturbing material. Many were sceptical of her claims and, as a result, the EMDR model came under considerable scrutiny. Later it became evident that similar therapeutic results were obtained with other forms of alternating bilateral stimulation, such as tactile and auditory bilateral stimulation. However, the name eye movement desensitisation and reprocessing (EMDR) stuck, even though different types of alternating bilateral stimulation were introduced. Since Shapiro's chance encounter in the park, the EMDR model has been developed into an eight phase therapeutic model of psychological therapy (Shapiro, 2001, 2002), the details of which are delineated here.

According to Shapiro (2001), phase one in EMDR is the history taking and treatment planning phase. EMDR treatment may not be suitable for everyone, so the EMDR practitioner needs to assess whether EMDR is suitable and whether it would be safe for the person to undergo EMDR at this point in time. Safety factors to consider would be whether the person is able to tolerate intense disturbance and has the ability to soothe their emotions. On a physical level, they also need to be able to tolerate intense affect, so cardiac and respiratory factors may need to be considered. Additionally, the EMDR practitioner would also need to assess whether the person is currently in a crisis, like a divorce, that could distract the processing. Another consideration is whether there is a reasonable degree of personal stability, no suicidal intent or self-harming, and whether the person has access to a support system. If the safety criterion is met, then a treatment plan can be designed. A full comprehensive history is taken to establish the presenting symptoms and all the distressing events the person has experienced. Earlier memories are often foundation memories that underpin and inform the current experience. During history taking, possible attitudes and behaviours that are needed for future action would be considered as well.

In EMDR, phase two is the preparation phase (Shapiro, 2001). Before one can proceed with EMDR, a therapeutic alliance has to be established with the person. The EMDR practitioner needs to explain the EMDR model to the person, so that the person understands that they may experience an intense emotional reaction during, and possibly after, the EMDR sessions. It is also an opportunity to ask questions, so that the person can make an informed choice as to whether they would like to undergo EMDR or not. Metaphors are often used to explain the EMDR model to help them conceptualise the process. For instance, one metaphor is that of a journey in a car. The practitioner is in the car with the person as they go through the memory. While going through the memory, the person is to take note and report back everything that is experienced, as if driving a car and reporting all that is seen and

experienced as they drive past. Before one can begin EMDR, the practitioner needs to assess the capacity of the person to modulate their affect or whether the person is able to soothe their emotions. This is an important aspect because people may experience intense emotions in the EMDR processing, which they should feel they can manage. In addition, after the session they may continue feeling intense emotions and will need to be able to soothe themselves. During the preparation phase people are taught self-soothing techniques, such as the safe place exercise and relaxation exercises. In this exercise, the person is asked to bring a safe place to mind and to notice the colours, sounds, environmental factors, textures, sensations, and relaxing feelings. In complex trauma cases, people may need a considerable time to learn how to soothe themselves using resource installation exercises, such as the light streaming exercise (Richman, 2003).

The third phase of the EMDR model is the assessment phase (Shapiro, 2001). During the assessment phase, the EMDR practitioner and person collaborate as to which disturbing memory will be targeted with EMDR. The memory should be of a specific event, and not a general feeling, belief or behaviour. Once the memory is identified, the person would be asked to identify an image that represents the memory. Whilst holding this target image in mind, the person would be asked for the associated negative belief and a desired positive belief. Negative beliefs are self beliefs that articulate the way the disturbance affects the self and may include statements such as: 'I am unlovable', 'I am unsafe', and 'I am out of control'. Positive cognitions are generally ways that the person would prefer to be, and could include statements such as: 'I am lovable', 'I am safe now', and 'I am in reasonable control'. The positive cognition should be an attainable goal that has the ability to generalise and inform the most amount of disturbing material. An indicator of how true the desired positive cognition felt would be established with a seven point validity of cognition scale (VOC), with a score of one indicating that the desired positive cognition felt completely untrue and a score

of seven indicating that the desired positive cognition felt completely true. The person would then be asked to identify the emotions or feelings associated with the target image. While holding the target image in mind, the person would also be asked to rate the level of disturbance, or their subjective unit of disturbance (SUD), with a score of zero representing a calm, neutral state with no disturbance, and a score of ten representing the worst possible disturbance. Lastly, the person would be asked to identify any physical sensations experienced while holding the disturbing image in mind. The assessment phase provides an opportunity to establish a baseline response of the different aspects of the memory of the distressing event, the visual images, the beliefs, the intensity of the emotions, and the physical sensations. With regards to beliefs, this phase encourages people to begin to consider other positive ways to think about themselves in relation to the distressing event.

During the fourth phase, or the desensitisation phase, the disturbing material is desensitised (Shapiro, 2001, 2002). During this phase, the dual attention stimuli or alternating bilateral stimulation is introduced. Visual bilateral stimulation, or eye movements, is most commonly used, but tactile and auditory stimulation are also forms of dual attention stimuli that are used in EMDR. Eye movements are usually produced by the person following the hand of the EMDR practitioner, which is moved from side-to-side in the visual path of the person. The corresponding effect is the person's eyes will move continually from side-to-side. Tactile bilateral stimulation can be produced by alternating hand taps, and auditory bilateral stimulation is produced by alternating sound into the left and right ear. The person is then asked to bring the disturbing target memory to mind, whilst simultaneously focusing on the alternating bilateral stimulation for short periods of time. During the periods of alternating bilateral stimulation, the person is asked to just 'notice' any thoughts, feelings, sensations, images, associations, and new insights that emerge, regardless of whether there is an increase, decrease, or no change, in disturbance, and to report these at the end of a set of stimulations.

The new material that emerges then becomes the focus of the next set of alternating bilateral stimulation and the person is asked 'to go' with the new material. Initially the person seems to focus on the disturbing aspects of the distressing event and in this process the disturbance reduces. However, the person also begins to make new links with more adaptive information as the associative process continues. The process of attending to the material that emerges while focusing on the external alternating bilateral stimulation continues until the disturbance of the target memory is reduced completely for all aspects of the target memory, or the subjective unit of disturbance reduces to zero. At times, the disturbance may not decrease completely with alternating bilateral stimulation and additional strategies, such as cognitive interweaves, may need to be used to stimulate the processing. This may occur when the person is looping, or when there is no change in the process, or when there is a lack of generalisation, or when the person has insufficient information. The role of cognitive interweaves is to facilitate the processing without distracting the process. Some examples of cognitive interweaves the EMDR practitioner may use is Socratic questioning, or a question such as 'What would you say to your friend if this happened to her?' If the appropriate information already exists with the person, a question such as 'I'm confused?' may help elicit the adaptive material. Or the person may need some new information to enhance their cognitive understanding, such as information on the automatic response to physical stimulation in sexual abuse. Instead of relying exclusively on the spontaneous process of the person when insufficient progress is made towards therapeutic goals, the cognitive interweaves entwines information from the EMDR practitioner to help reach the therapeutic resolution. Whilst the use of cognitive interweaves is effective, it is used sparingly because the person will make more valid and powerful changes if the process comes from within themselves.

Phase five is known as the installation phase and begins when the subjective unit of disturbance for the target memory has reduced to zero (Shapiro, 2001, 2002). The aim of this phase is to strengthen the positive cognition so that it feels completely valid while holding the target image in mind. The EMDR practitioner would check out whether the positive cognition established in the assessment phase is still the most valid for the person, or whether another positive cognition spontaneously emerged during the processing. Once the EMDR practitioner has established which is the most valid positive cognition, this would be strengthened using alternating bilateral stimulation. The aim is for the validity of all the positive cognitions to reach seven on the validity of cognition scale, where the score of one indicates that the positive cognition did not feel true at all, while a score of seven indicates that the positive cognition genuinely felt true on an emotional level.

The sixth phase is called the body scan and occurs after the desired positive cognition is fully installed (Shapiro, 2001). The person is asked to bring to mind both the target image and the positive cognition and then to focus on their body and notice any body sensations. Any residual physiological responses are then reprocessed using alternating bilateral stimulation. The residual physiological sensations often dissipate, however in some cases more disturbing unprocessed material may emerge which can then be reprocessed using alternating bilateral stimulation, until there is no further disturbance.

Phase seven is referred to as closure (Shapiro, 2001). Whilst a person may experience an intense level of disturbance during the session, the person should not leave the session in distress but should be helped to return to a state of equilibrium before leaving the session. This occurs particularly in sessions where the subjective unit of disturbance has not reduced to zero and the session is considered incomplete. When this occurs, the person needs to be debriefed as to what to expect between the sessions, as disturbing images, dreams, thoughts, feelings and sensations may continue for a few days after the sessions. If people are aware

that disturbance may be experienced between sessions and that this is a sign that additional beneficial processing is occurring, they will not be alarmed if they feel distressed between sessions. The person is also encouraged to make a note of these disturbances in a journal and to bring the information to the following session. The person is also reminded to make use of their safe place exercise and relaxation skills to soothe the distress between sessions and help maintain stability.

The eighth phase is known as the reevaluation phase and takes place at the beginning of each subsequent session. When a person returns for the next session, the EMDR practitioner will establish the level of disturbance for the target memories that were processed in previous sessions. This will reveal whether the effect of the EMDR treatment has been maintained between sessions. The EMDR practitioner would go through the notes that were made between sessions with the person to examine what kind of disturbance was experienced. Some people report that they continued processing after the previous session, having more flashbacks, dreams, body sensations and high levels of distress, either because the disturbance has not reduced or because other aspects of the memory emerged. In these cases, the EMDR practitioner would return to the target memory to continue reprocessing. Some people, on the other hand, may report that their disturbance when recalling the target memory has reduced and that there is a definite reduction in the nightmares, flashbacks and bodily sensations. If the person experiences no disturbance when recalling the original target image, then the EMDR practitioner would target other aspects of the memory that are still disturbing. The reevaluation and reprocessing should occur until the person experiences no disturbance when recalling all aspects of the event. At times, the person can experience considerable changes in behaviour as a result of the reduction of the disturbance related to the distressing memory. This may disrupt the homeostasis in the family system or surrounding social system, which may lead to further changes in their surrounding system.

2.2 The nature of memory

2.2.1 The nature of non traumatic memory

In order to understand the nature of traumatic memory, it is necessary to understand the processing of ordinary memory. According to Solomon and Heide (2005), the memory of ordinary events is initially stored in the limbic system as episodic memory. Characteristically these episodic memories are autobiographical, or the memory of a personal experience that includes a sense of self, together with spatial and temporal dimensions of the events that occurred. Whilst the amygdala evaluates the emotions associated with the episodic memory, the hippocampus is involved in the storage of the cognitive aspects of the episodic memory (van der Kolk, 2006). Stickgold (2002) explains that it is not so much the storage of the information that takes place in these areas; rather, these areas represent the pathways that are used to process the information. Over a period of time, the episodic memory is processed and transferred to the association areas in the frontal lobes of the neocortex where the memory is further embellished with personal meaning (van der Kolk, 1994). These long-term semantic memories, or factual narrative memories, are stored in the neocortex, and are seen as a synopsis of the episodic memory that holds information, which can be drawn on in the future for learning (Solomon & Heide, 2005).

2.2.2 The nature of moderately traumatic memory

According to Solomon and Heide (2005), memory that is moderately traumatic tends to linger longer in the right limbic system compared to the processing of ordinary episodic memory. These moderately traumatic memories are usually processed when people talk about their distressing event, think about it and sometimes even dream about the event. With time, the memory becomes part of the narrative memory that is stored long-term as semantic

memory in the associative frontal lobes of the neocortex. Moderately traumatic memory is processed in a similar way to episodic memory, in that it is summarised and the information is stored in the neocortex for future retrieval.

2.2.3 The nature of overwhelming traumatic memory

In a traumatic event, the experience is so intense that it overwhelms the neurobiological capacity of the brain to process the information in the way that ordinary memory would be processed (Solomon & Heide, 2005). In this case, the episodic memory is held in its original highly disturbed traumatic state in the right limbic system *ad infinitum*. In this immobilised state, the unprocessed visual, cognitive, olfactory, auditory and somatic aspects of the episodic memory are re-experienced with the same intensity of the highly disturbing original event. This correlates with the findings of Rauch, van der Kolk, Fisler, Alpert, Orr, Savage et al. (1996) who claim there is an increase in activity in the right limbic system in people who display post traumatic symptoms following a traumatic experience. In addition, they report an increase in activity in the visual cortex which may correspond with vivid flashbacks, and a decrease in activity of the anterior cingulate cortex that usually moderates the limbic system (Rauch et al., 1996). van der Kolk (1994) suggests that because the traumatic episodic memory is not processed, it remains in a motoric state in the nondeclarative system, and is not transferred to the frontal lobes of the neocortex as a semantic or declarative memory.

In the EMDR model, Shapiro (2001) postulates that these unresolved traumatic memories are ‘frozen in time’ or statically stored in their ‘state-specific form’ because they are stored in isolated disparate neuro networks. The more intense the valence of the emotional affect, or the more highly disturbing the experience, the more isolated and disparate the nature of these networks. There is also a timeless aspect to these traumatic memories because,

regardless of the amount of time that has past, the memory does not seem to lose its intensity and can still be experienced as if it is happening in the here and now.

According to Solomon and Heide (2005), these traumatic memories can be so terrifying that they are avoided and kept out of consciousness by not thinking or talking about the event, which in turn prevents the opportunity for the traumatic memory to be reprocessed. However, the highly disturbing material can also be triggered by associative stimuli, which activates the parts of the brain that supports the disturbing emotions. This results in the re-experience of the original trauma, which can be so disturbing that the person may lose their sense of time and place, and feel like they are back in the original event.

Rauch et al (1996) and van der Kolk (2004) also explain that there is a decrease in activity in the Broca's area of the brain, the expressive speech centre, which is vital for the articulating of what one is feeling and thinking into language and the processing of semantic meaning. They postulate that the decrease in activity in this area may provide an explanation of the 'speechless terror' that is experienced during and after a traumatic event. Even during the processing of the traumatic material, a person may find it difficult or nearly impossible to verbalise the horror of their experience.

Some cognitive therapists postulate that people need to know an event is dangerous or distressing before they can make this interpretation at the time of the event. However, according to Shapiro (2001) this seems contrary to the notion that people have a natural innate alarm response. Shapiro (2001) illustrates this with an example of a young child who may be traumatised by the roar of lion, even though the child may not have initially feared the lion because of not having the knowledge that the lion is dangerous. Preverbal children may also display symptoms of post traumatic stress as a result of abuse, which seems to indicate that language does not necessarily have to be a part of the stimulus in a traumatic event (Shapiro, 2001).

Solomon and Heide (2005) claim the development of the neurobiology of the brain is affected by the quality of the relationship with the caregiver. The development of the right brain is compromised in children who are severely neglected, leading to the impairment of the orbitofrontal cortex and the neural connection to the limbic system. This decreases the capacity to regulate affect, as the neglected child does not develop the ability to regulate the intensity and duration of their emotions (van der Kolk, 1994; Schore, 2002). They also have difficulty deciphering emotional expression and therefore may find it difficult to develop empathy towards other people (Solomon & Heide, 2005).

2.2.4 The role of traumatic memory in EMDR

Before EMDR treatment, people report that they can still experience the intensity of the highly disturbing emotions when bringing a traumatic memory to mind. Some report that they can still smell the smells at the time of the event, and they can still hear the sounds in the memory. In addition, they often report that the images are vivid and they may have distressing dreams about the event. The emotions associated with the traumatic event are often terrifying, and they can still experience strong body memories, possibly palpitations, dizziness, shaking, sweating, nausea and vomiting. These are all indications that the memory is still an episodic memory that is stored in a non-declarative state, or state-specific form (van der Kolk, 1994; Shapiro, 2001; Solomon & Heide, 2005). EMDR facilitates the processing and the transfer of these disturbing memories to the associative frontal lobes of the neocortex. Once stored as semantic, declarative memories, these memories lose their power or potency. People often report that they know the traumatic event happened, but they can no longer experience the disturbance and it no longer feels like they are back at the time of the event. Rather, the memory feels like a past memory.

In order to explain to people what EMDR hopes to achieve, the researcher uses the illustration of attending school. Most people would agree that they had a couple of bad days at school; however, now they do not have nightmares about it, nor does it come to mind each day, nor do the memories seem vivid when called to mind, nor do they ruminate about the events. This is because the memory has been processed and has become a past memory. The researcher explains to people the goal is to get their current traumatic memory that still feels highly disturbing, to feel like a factual past memory. Obviously, one would not use this analogy with people who still had highly disturbing school memories, such as bullying experiences.

The memory that is targeted in EMDR for processing can be any memory that is still experienced as disturbing. According to the diagnostic criteria for post traumatic stress disorder (DSM-IV, 1994), a traumatic memory is one in which people have experienced or witnessed a threat to life, or to the physical integrity of a person. Shapiro (2001, p. 42) refers to these life threatening events as ‘large T’ traumas. However, non life threatening events may also present with similar intense symptoms, such as intrusive memories and nightmares. Shapiro (2001) refers to these non life threatening yet distressing events as ‘small t’ traumas. In this research project, both ‘big T’ traumas and ‘little t’ traumas will be considered for EMDR treatment.

2.3 The theoretical model of EMDR: Adaptive information processing model

The model of adaptive information processing is a working hypothesis postulated by Shapiro (2001) that provides an explanation of the clinical effects of EMDR and why these changes occur so rapidly and so consistently. The adaptive information processing model is based on the premise that most pathology is rooted in earlier life experiences. Disturbing experiences earlier in life are not adequately processed and assimilated, and are therefore

physiologically stored in the neurobiological system in a static distressed state or state-specific form (Shapiro, 2001). Experiences stored in this state-specific form go on to influence other experiences in the life of a person and in turn affect their development pattern.

For instance, a person may have appropriately felt intense feelings of fear, powerlessness, and being out of control when physically abused as a child. When this event comes to mind, the child continues to experience the intensely disturbing emotions, cognitions and physical sensations. This in turn, affects any subsequent experiences the child may have. For instance, the child may begin to experience fear in other areas and perceive the world as unsafe. In addition, the intensely disturbing reaction to the original event permeates into the everyday life, so while a child felt powerless at the time of the original event, the child may come to believe 'I am powerless'. So the earlier life event begins to influence the behavioural, cognitive and physical experiences of the child, and impacts on the development of the identity structure. As an adult, the person may come to realise his or her reaction is inappropriate. For instance, the person may meet the abuser, who is now bound to a wheelchair and still experience the intense feelings of fear, powerlessness, and being out of control that is associated with the original abusive events, even though the person knows the abuser is now no longer a threat (Shapiro, 2001).

Processing the aetiological memory using EMDR not only reduces the distress of the experience but also allows the memory of the event to link to more adaptive and positive associations (Shapiro, 2001). The clinical pathology is open to change by virtue of a change to the aetiological experience. For instance, the person may undergo EMDR and the feelings of fear and powerlessness diminish and the cognitions associated with the abusive memory transform to a more positive state. So instead of feeling powerless, the person would feel the more appropriate adaptive adult response of strength in relation to the abuser. In order for EMDR to be most effective, aetiological memories that hold negative self beliefs are sought,

as a shift in fundamental negative self beliefs leads to a significant shift in the cognitive structure of the person which, in turn, changes the way he or she responds to the environment.

2.3.1 Innate information processing system

Fundamental to the adaptive information processing model is the notion that there is an innate information processing mechanism which assimilates information, so that an experience becomes a narrative memory with no intense reaction. However, the adaptive information processing model postulates that physiologically stored traumatic memories are not processed because the information processing mechanism becomes frozen, stuck or 'blocked' (Shapiro, 2001, p.18). EMDR can be seen as the instrument that stimulates the information processing mechanism so that the traumatic material can be transformed from a distressing traumatic memory to a narrative memory that is no longer distressing. This can be likened to a natural physiological healing process. Most people who cut their finger will find that this will heal, as the body has a biological propensity to return to homeostasis. The adaptive information processing model postulates that the mind and body have a biological propensity to return to health through the activation of the information processing mechanism, through the assimilation of traumatic memory that leads to the resolution of an adaptive response (Shapiro, 2001).

2.3.2 Aetiological memory represents pathology

In the adaptive information processing model, symptoms are not seen as the pathology: rather the disturbing aetiological memory is seen to represent the pathology (Shapiro, 2001). Rather than addressing the symptoms, EMDR focuses directly on the aetiological memory with the aim of transforming the distressing information held in the visual, auditory, cognitive, emotive, somatic and olfactory systems. This in turn would reduce

the pathology, as the reduction in distress and links to new positive adaptive material leads to changes in the way the person experiences the aetiological memory, and the way the person experiences and responds to their environment. Before EMDR, the visual, auditory, olfactory, cognitive, emotive and somatic aspects of the aetiological memory can be intensely disturbing and static or 'frozen in time' (Shapiro, 2001, p.42). This is consistent with the notion of traumatic memory, stored in a nondeclarative state (van der Kolk, 1994). However, following EMDR people often report no disturbance in the visual, auditory, olfactory, emotive and somatic aspects of memory, and experience positive cognitions when recalling the aetiological memory. This is consistent with the notion that non traumatic memory is stored in a narrative state (van der Kolk, 1994). These changes seem to occur spontaneously in the EMDR process (Shapiro, 2001).

2.3.3 Change to positive state

The adaptive information processing model also postulates that the state-specific memory transforms, with the use of EMDR, to a positive adaptive resolution (Shapiro, 2001). Besides not experiencing distress when recalling the aetiological memory after EMDR, the person experiences a calm self-acceptance. Evidence suggests that whilst there is a shift to a positive state, there does not seem to be a shift to a negative state. Even though a person may have feelings of self-loathing and intense distress during the processing, the end point of the resolution is always a positive state. Thus rape victims may feel a loathing and intense distress during the processing of the traumatic memory, but the end resolution is one of a sense of peace and calm self-acceptance (Shapiro, 2001).

2.3.4 Move to self-efficacy

As a change occurs in the aetiological traumatic memory, there is a corresponding spontaneous change in the way people experience themselves (Shapiro, 2001). The adaptive information processing model postulates that the state-specific aetiological memory is responsible for the pathology because the disturbing material informs the behaviour, emotional, cognitive and somatic response. When there is a transformation and reduction of the disturbing material, there is a corresponding change in cognitions, behaviour, emotions, perceptions and somatic experience. Evidence suggests that with a transformation of the traumatic experience, there is a spontaneous shift to self-efficacy and feeling more valuable, worthwhile, useful and more effective (Shapiro, 2001).

2.3.5 Rapid changes

It is generally assumed that therapeutic change occurs over a relative long period of time. One feature of EMDR treatment is the significant transformation over a relatively short period of time (Shapiro, 2001). This rapid rate of recovery occurs no matter how long ago the trauma occurred. The transformation of traumatic material occurs when disturbing material in isolated neuro networks links to more adaptive networks. One possible explanation of the rapid rate of transformation is the close biological proximity of the neuro networks, so it is immaterial how long ago the traumatic event occurred (Shapiro, 2001).

2.4 Theories of mechanisms of action in EMDR

2.4.1. Psychological mechanisms of action

Hyer and Brandsma (1997) argue that whilst EMDR may be made up of components from other therapies, it may be effective because it is based in sound psychotherapy principles. For instance, EMDR also enables the person to focus inwards on material that is

manageable, which in time enables people to relinquish unnecessary defences. The EMDR practitioner is non-directive and not intrusive. Not using leading language enables the EMDR practitioner to be an effective listener and act as a blank screen, while the bilateral stimulation fulfils the urge of the practitioner to be involved. From the beginning, EMDR establishes the expectations of treatment. It accesses associative networks and encourages processing, which is central to change. EMDR pays attention to affect and sensations, whilst also paying attention to cognitions, by identifying negative cognitions and reframing the positive cognitions as goals. EMDR moves towards positive growth, as static traumatic material is assimilated.

EMDR is made up of a variety of components that are compatible with other therapeutic models, such as the psychoanalytic, psychodynamic, behavioural and cognitive approaches. Some may argue that the EMDR effect is the result of one of these components, whilst others may argue it is a combination of these components.

2.4.1.1 Free association

Like the psychodynamic approach, the EMDR model postulates that aetiological memories underpin and influence subsequent patterns of behaviours (Shapiro, 2001). According to Freud's psychoanalytic model, conflicts were the result of blocked affects and free association was used to explore these conflicts and distresses that disrupt associations (Mollon, 2005). Mollon (2005) explains that EMDR may be effective because it induces all the sensory details of the traumatic and associative memories. During EMDR the person can attend to emerging memories in a process reminiscent of free association. The process in EMDR is different to the process in desensitisation (Shapiro, 2001). During desensitisation a therapist would get the person to return to an image and would continue to work with that image for a considerable period of time (Shapiro, 2001). In EMDR the person begins with a

traumatic image and is asked to 'go with that'. During EMDR the person is free to access any part of their memory system and may begin to associate outside of the network of traumatic memories (Shapiro, 2001). This process allows a person to move freely from one aspect of a memory to another and to link to more adaptive information. At times, people may experience abreactions, or an intense display of emotions or sensations, and afterwards describe a relief similar to that of a cathartic effect (Shapiro, 2001).

2.4.1.2 Cognitive restructuring

During the assessment phase of the EMDR protocol, the person is asked to identify not only a negative cognition associated with the traumatic representative image, but also to identify a desired positive belief (Shapiro, 2001). By getting the person to think about a possible desired self belief, the person begins a process of thinking towards a resolution in the future. This may be the genesis of a cognitive restructuring process that lays out the prospect of linkage to adaptive material. In cognitive therapy, the formulation of positive beliefs is a component of the therapeutic process, and the ability to construct new meaning becomes part of a more helpful coping strategy (Meichenbaum, 1996; Tennen & Affleck, 1999).

2.4.1.3 Mindfulness

Shapiro (2001) postulates that EMDR induces a 'stabilised observer stance' (p.322). This is reminiscent of the Eastern meditation technique of mindfulness, which brings a particular kind of attention to each aspect of the current experience (Kabat-Zinn, 1990). In dialectical behaviour therapy, mindfulness is used to regulate emotions. As the ability to focus the mind increases, the ability to control intense emotions develops (Linehan, 1993). Baer (2003) suggests mindfulness is a process of deliberately focusing attention on both internal and external experiences in the here-and-now.

Teasdale (1999) delineates three different configurations of processing in his model of interacting cognitive subsystems. He postulates that the most amount of emotional processing is facilitated in the mindful experiencing/being mode, in which a person can experience their thoughts, feelings and sensations reflexively as subjective experiences. However, he postulates that the conceptualising/doing configuration of processing may prevent emotional processing, as thoughts, feelings and sensations are seen as impersonal objects and are detached from the subjective experience. In addition, little emotional processing occurs in the mindless emoting configuration, as a person can become so engrossed in their emotional reactions that there is little awareness and reflection. Shapiro (2001) postulates that EMDR is effective, as the alternating bilateral stimulation attracts just enough attention away from mindless emoting and too much doing, which compels the mindful experience/being response. This in turn, enables a person to experience the disturbance, whilst being a non judgmental observer.

Bishop, Lau, Shapiro, Carlson, Anderson, Carmody et al. (2004) delineate a two-component model of mindfulness of self-regulation of attention and orientation of response. The self-regulation of attention involves the direct experience of thoughts, feelings and sensations, by bringing them into awareness through the regulation of the focus of attention. Sustained attention would be required to keep the experience in awareness (Posner & Rothbart, 1992), whilst the flexibility in attention would facilitate the switching from one element to another (Posner, 1980), which in turn, would inhibit the elaborative secondary processing. This researcher (Bodill, 2009) postulates that in EMDR the dual attention stimuli would facilitate the sustained attention required to keep the experience in awareness in EMDR processing. In addition, the EMDR technique of alternating a verbal cue with dual attention stimulation not only mimics but facilitates the switching from experiencing the thoughts, feelings and sensations to acknowledging these. However, the EMDR process is

different in that it facilitates the secondary elaboration to reach an adaptive resolution rather than inhibit it. The second component is the orientation of experience (Bishop et al. 2004). In both mindfulness and EMDR, the person is encouraged to 'just notice' (Richman, 2004, p. 52) whatever emerges in the flow of consciousness, as all thoughts, feelings and sensations are relevant. The view of curiosity and acceptance in mindfulness is seen to reduce the avoidance mechanisms, which would likely lead to an improved tolerance of disturbing affect (Bishop et al, 2004). In EMDR, the disturbing effect is removed so there is no need for it to be tolerated. The researcher of this study (Bodill, 2009) postulates that while EMDR may incorporate aspects of mindfulness, it does not offer a comprehensive explanation of the EMDR mechanism of action.

2.4.1.4 Interrupted exposure

During the EMDR processing, people are asked to focus their attention onto the traumatic material which is then paired with the bilateral stimulation (Shapiro, 2001). The resulting decrease in disturbance seems consistent with the conditioning response in behavioural therapy. During the EMDR associative process there also seems to be a generalisation effect, which is also consistent with behaviourism (Shapiro, 2001).

Exposure techniques are based on the theory of learning. Pavlov showed that pairing a conditioned stimulus (a bell) with an unconditioned stimulus (a shock), leads to both stimuli eliciting an aversive emotional reaction, which is known as classical conditioning. This in turn leads to avoidance behaviour, as both stimuli (the bell and the shock) are shunned in order to avoid the aversive emotional reaction. Exposure therapy was based on this theory, in that increased exposure to distressing memories prevents the avoidance response and thereby extinguishes the associated fear and distress. Standard exposure therapy, also known as

flooding and implosion, requires continuous exposure to an increased level of anxiety for a prolonged period of time for inhibition to develop (Craske, 1999).

Rogers and Silver (2002) state that EMDR appears to be distinct when compared to standard exposure therapies, as EMDR uses brief interrupted exposure compared to prolonged continuous exposure. During the EMDR process people are exposed to brief periods of high levels of distress, which are alternated with brief communications (Shapiro, 2001). This brings about a rapid reduction in distress. Some theorise that the exposure element in EMDR is the exclusive mechanism of change (Lohr, Tolin, & Lilienfield, 1998; McNally, 1999). However, similar results are not seen in systematic desensitisation which also involves interruptions in exposure. For instance, the brief exposure in systematic desensitisation is only effective with low arousal levels and low-intensity stimuli, and is not as effective with high levels of arousal (Craske, 1999). It is generally agreed that prolonged exposure is more effective than brief exposure in exposure therapy (Chaplin & Levine, 1981; Foa, Steketee & Rothbaum, 1989; Marks, Lovell, Noshirvani, Livanou, & Thrasher, 1998). Shapiro (2001) postulates that while exposure may be an element in the mechanism of change in EMDR, the brief attention in EMDR seems to evoke a different mechanism to exposure. She adds that exposure is inadequate as an explanation for the expeditious effects obtained with EMDR.

2.4.1.5 Distraction

Dyck's (1993) conditioning model suggests that the use of eye movements distracts the person from the traumatic material, which causes a failure in habituation. The distraction does not allow the person to concentrate on the traumatic material, so the distress that the person used to feel when the memory came to mind is no longer reinforced. Dyck (1993) also suggested that the type of distracter may affect the efficiency of the reduction of distress. He suggested that visual bilateral stimulation would be most effective in reducing the vividness

of disturbing images, while auditory bilateral stimulation would be most effective in reducing the disturbance of auditory memory and in turn, tactile bilateral stimulation would be most efficient in reducing somatic memory. However, clinical evidence has shown that the visual bilateral stimulation alone has been effective in reducing the disturbance of auditory, olfactory and somatic memory.

Other clinical evidence shows that distraction may not reduce the experience of distress. Haw and Dickerson (1998) showed that levels of anxiety were significantly greater for people who were exposed to an anxiety producing situation that was paired with distraction, compared to those paired with focused exposure. Rodriguez and Craske (1993) explain that distraction seems to interfere with the mechanism that is needed to reduce fear by preventing the cognitive processing of the fear response. So the concept of distraction does not play a substantial role in explaining the reduction of disturbance in traumatic memory when using EMDR.

2.4.1.6 Dual attention stimulation and the orienting response

A popular hypothesis regarding the mechanism of change in EMDR is the orienting response which is elicited by the dual attention stimulation (Shapiro, 2001). Sokolov (1990) explained that the orienting response is characterised by the alerting response, which is elicited when a new stimulus is introduced into the environment that is incongruent with what is anticipated. However, if the stimulus is anticipated, then the investigatory response, or an active search of the environment, is evoked. There are a number of hypotheses centred on the orienting response as the mechanism of change in EMDR.

Denny (1995) purported the model of external inhibition in which the eye movements elicit an orienting response while processing traumatic memory, results in a partial inhibition or suppression of the intense effect associated with the memory. This permits adaptive

information to emerge. Nathanson (1996, as cited in Shapiro, 2001, p.324) postulates the orientating response interrupts these associations, which allows for the assimilation of new adaptive information. Lipke (2000) postulates the information processing mechanism may be activated by the introduction of the orienting response. Eye movements allow for the focusing on an external cue, creating an orienting response that interrupts the associations to the disturbing affect, which in turn permits erudition.

Armstrong and Vaughan (1996) suggested a model of extinction in which the visual bilateral stimulation of eye movements activates an intense orientating response. This orienting response facilitates the attention to the memory while interrupting the avoidance response. In this process, the previous intense response associated with the traumatic memory is rapidly extinguished as no immediate threat is available in the therapeutic environment. Kuiken, Bears, Miall and Smith (2001) postulated that the eye movements in EMDR facilitate the attentional orienting response. They found there was a faster response to unexpected stimuli in a visual tracking condition compared to a stationary gaze. They claim the visual tracking condition induces attentional and semantic flexibility, which could facilitate the transfer of episodic memory into the narrative declarative memory system.

MacCulloch and Feldman (1996) postulate the model of reassurance reflex. They hypothesize that via the negative visceral element of the orienting response, a threat is identified and the fight or flight response is activated. However, via the positive visceral element of the investigatory orienting response, a reassurance reflex is activated by the eye movements in EMDR. So the introduction of eye movements during EMDR, elicits an investigatory response that is experienced as safe with no threat, or the reassurance reflex, which in turn elicits a de-arousal affect.

Barrowcliff, Gray, Freeman and MacCulloch (2004) observed that a psycho physiological de-arousal process occurs only when negative autobiographical memories are

elicited with eye movements, and not when positive autobiographical memories are elicited. They concluded that the strong de-arousal of negative memories supported the model of reassurance reflex by MacCulloch and Feldman (1996). The fact that no de-arousal effect occurs in positive memories also supports MacCulloch and Feldman's (1996) hypothesis that in order for the de-arousal effect to occur, the negative visceral response loop has to have been activated by a perceived threat.

Some argue that eye movements are not necessary for the changes seen in EMDR. For instance, Renfrey and Spates (1994) found significant positive changes with both standard eye movements and when eye movements were replaced with fixed visual attention. Pitman, Orr, Altman, Longpre, Poife, and Macklin (1996) found the eyes-fixed condition was slightly more effective than eye movements. Monnier (1968, as cited in Shapiro, 2001, p.334) hypothesised that the parasympathetic nervous system was activated by tasks that demanded visual integration. The visual task of the eyes-fixed condition may therefore stimulate the parasympathetic system which would in turn interfere with the fight or flight response associated with the activation of the sympathetic nervous system. Whilst this may account for the improvements noted in the eyes-fixed condition, it does not however explain why tactile and auditory stimuli also facilitate a change in EMDR. However, Amedi, Jacobson, Hendler, Malach and Zohary (2002) may provide elucidation, as they have demonstrated using fMRI that the lateral occipital complex is activated when objects are both seen and touched. They postulate that object activation is robust for the visual and tactile stimulation, reflecting that vision and touch may share common yet exclusive attributes. Yet auditory stimulation does not elicit a substantial response in this cortical area.

2.4.1.7 Relaxation response

Wilson, Silver, Covi and Foster (1996) postulate the model of compelled relaxation response, in which the eye movements induce a relaxation response. They postulate that there is an increase followed by a consistent decrease in physiological levels of arousal, in a clear relaxation response, with exposure to eye movements without an instruction to focus on the traumatic memory. By pairing emotional distress with the compelled relaxation response, change occurred by the mechanism of reciprocal inhibition. Sack, Lempa, Steinmetz, Lamprecht and Hofmann (2008) also found patterns of autonomic activity that suggest considerable psycho physiological de-arousal during EMDR.

Hedstrom (1991) hypothesised, after measuring alpha waves, that the induction of eye movements promotes relaxation. He postulates that certain eye exercises in the hatha yoga tradition induce relaxation and reduce hyper arousal. He suggests that the mechanism in these eye exercises may be similar to the mechanism of action in EMDR.

Kohyama (2001) states that a profound muscle inhibition occurs during REM sleep and the reticular formation in the brainstem is implicated in this function. Yet, an increase in activity in brainstem inhibitory centres was found in both REM sleep and postural relaxation during waking in other studies (Siegel, Wheeler, & McGinty, 1979; Siegel, Nienhuis, Fahringer, Paul, Shiromani, Dement et al. 1991). Shapiro (1989, 2001) postulated that relaxation response may be evoked by the eye movements in EMDR through the reticular formation. According to Jansen, Van Nguyen, Karpitskiy, Mettenleiter and Loewy (1995), the fight or flight response emanates from sympathetic nervous system. Shapiro (2001) suggests that EMDR may trigger a relaxation mechanism, thereby activating the parasympathetic system, which in turn would inhibit the sympathetic nervous system.

2.4.1.8 Hypnosis

Both EMDR and hypnosis use alternating eye movements, so some have assumed that EMDR may have a hypnotic effect. However, results on electroencephalographs (EEG) in research on brain functioning show different brain wave patterns in EMDR and hypnosis. EEG readings during hypnosis have demonstrated that people are in an altered state of consciousness with an increase in theta waves (Sabourin, Cutcombe, Crawford, & Pribram 1990), predominance of alpha waves (Mearns, 1960, as cited in Shapiro, 2001, p. 326) and hemispheric asymmetries in beta waves (DePascalis & Penna, 1990). On the other hand, EEG readings during EMDR were within the range of a normal waking state, which suggests that EMDR does not produce a state of altered consciousness nor increase suggestibility.

A number of clinical differences between EMDR and hypnosis have also been noted. For instance, in hypnosis there is an increase in suggestibility, especially with people who are highly hypnotisable. However, during EMDR people would reject a suggestion that was not valid to the way they viewed the memory (Shapiro, 2001). Another difference is the way memories are processed. In EMDR, elements of the memory may emerge in a random order, as if the person is jumping to different parts of the memory. In hypnotism, however, the memories are dealt with in a chronological fashion (Shapiro, 2001).

2.4.2 Neurobiological mechanisms of action in EMDR

To date there is no conclusive theory of the neurological mechanism of action in EMDR, so all the information published remains speculative (Shapiro, 2001).

2.4.2.1 Ocular motility

Shapiro's (2001) inspiration to develop EMDR came from the work on ocular motility, or rate of eye movements, which was seen to be influenced by many types of

cognitive activity. A number of researchers have shown that increased ocular motility is associated with rapid cognitive shifts (Antrobus, Antrobus, & Singer, 1964; Singer & Antrobus, 1965) and high concentration levels (Klinger, Gregoire, & Barta, 2007) required by some tasks. On the other hand, low levels of ocular motility were associated with tasks with low levels of concentration (Klinger, Gregoire, & Barta, 2007) and static ideation and passive thinking (Antrobus, Antrobus, & Singer, 1964; Singer & Antrobus, 1965). Antrobus, Antrobus and Singer (1964) also noticed that there was greater ocular activity when observing a moving image compared to observing a static image. De Gennaro and Violani (1988) also suggested a link between ocular motility and cognition, as more downward movements were noticed for verbal questions and less were noticed for spatial and easy questions. In addition, ocular relaxation was seen to reduce ocular motility by up to 40%, which had varying effects on physiological, autogenic and self-reported relaxation (Lichstein & Sallis, 1982). From these hypothesis, one could assert that increasing ocular motility, or increasing the rate of eye movements, would increase cognitive functioning and thereby facilitate the cognitive processing of non-declarative memories, the details of which are still under investigation.

2.4.2.2 Hemispheric synchronization

Shapiro (2001) postulates that traumatic memories retain their intensely disturbing affect because the information processing mechanism becomes blocked, which keeps the memory in its disturbing form. She postulates that the bilateral stimulation of eye movements has a direct effect on the cortical functioning and activates the synchronisation of both hemispheres, which facilitates the information processing mechanism and the reduction of distress.

Knyazeva, Kiper, Vildavski, Despland, Maeder-Ingvar and Innocenti (1999) found that when bilateral iso-oriented gratings extended across, or came close to the vertical

meridian, interhemispheric coherence would increase. They added that visual stimuli initiated interhemispheric synchronization. Bergmann (1998) suggests that the bilateral stimulation may resynchronise the two cerebral hemispheres. This possibly occurs as a result of the pacemaker cells in the septum and/or the pontine saccade generator in the midbrain, being stimulated by the bilateral stimulation, or the bilateral stimulation emulating the correct cerebral activity, which may facilitate the activity of the amygdala becoming integrated with neocortical activity. Bergmann (1998) postulates that the integration of the higher cortical functions may be made possible by the down regulation of the pontine and limbic area, as a result of the bilateral stimulation. He points out that EMDR may be the first therapeutic tool that directly affects the amygdala and limbic structures in the brain.

Researchers have also demonstrated that stimulation of one cerebral hemisphere, by lateral orientation of attention, produced differing emotional affects. For instance, Drake and Seligman (1989) demonstrated that selective activation of the left hemisphere produced greater positive affect than the activation of the right hemisphere. They postulated that greater left hemisphere activation is correlated with increased positive affect. On the other hand, the activation of the right hemisphere is associated with increased processing of negative affect. Merckelback and Van Oppen (1989) found that a shift of gaze to the right, which purportedly activates the left hemisphere, produces more positive evaluations than shift of gaze to the left, which purportedly activates the right hemisphere. They postulate that the processing of positive emotions tends to occur in the left hemisphere, whilst the processing of negative emotions tends to occur in the right hemisphere. The use of visual bilateral stimulation, such as eye movement moving from right to left, would stimulate both the left and the right hemisphere. Drake and Bingham (1985) found similar results when using auditory lateral stimulation. Shapiro (2001) postulates that bilateral stimulation in EMDR may facilitate the integration of the information that is processed, as the stimulation of the left hemisphere

producing positive affect alternates with the stimulation of the right hemisphere producing negative affect.

Other research has demonstrated the differing roles of the left and right hemisphere in the retrieval of episodic and semantic memory. Tulving, Kapur, Craik, Moscovich and Houle (1994), suggest that the right prefrontal cortical regions tend to be more involved in the retrieval from episodic memory, whereas the left prefrontal cortical regions tend to be more involved in the retrieval from semantic memory.

2.4.2.3 Visuospatial sketchpad model of working memory

Andrade, Kavanagh and Baddeley (1997) examined the effects of eye movements on working memory. They paired eye movements, eye fixed and tapping with vivid images of distressing memories, and noted that eye movements reduced the distress more effectively than eye fixed and tapping. They postulated that the eye movements worked to disrupt the function of the visuospatial sketchpad (VSSP) of working memory as the intensity of the distress reduced. However, van den Hout, Muris, Salemink and Kindt (2001) noted that the effects of the memory processing continued even after the visuospatial task had ceased, which could not be accommodated by Andrade et al. (1997) model of visuospatial sketchpad of working memory. van der Hout et al. (2001) postulated that a more likely explanation of the EMDR effect was analogous to reciprocal inhibition.

2.4.2.4 REM sleep

Research has postulated that there is a strong relationship between sleep and memory consolidation, yet the relationship between sleep stages and memory consolidation are complex. Some research suggests that nondeclarative memory seems to be correlated with periods rich in REM sleep, whereas declarative memory tends to benefit from processing in

slow wave sleep (Wagner, Gais & Born, 2001). This suggests that REM sleep enhances emotional memory (Wagner, Gais & Born, 2002). Gais and Born (2004) go onto say that the periods rich in REM sleep have no consistent benefit to the consolidation of declarative memory. Rather the activation of the newly acquired memory in the hippocampus seems to facilitate the integration of declarative memory into neocortical networks (Buzsaki, 1996). However, Plihal and Born (1997) postulate that REM is necessary for the integration of memories into semantic memory or the task of visual discrimination. Both REM sleep together with a certain amount of preceding slow wave sleep, are needed for improvements on these tasks (Stickgold, Whidbee, Schirmer, Patel, Hobson, 2000). So the hypothesis that eye movements and REM sleep serve similar functions is an interesting one, with further research being indicated.

2.4.2.5 Neurobiological model of the orienting response

Bergmann (2000) postulates that the redirecting of attention in EMDR induces the REM sleep mechanism, which activates specific parts of the anterior cortex of the cingulate gyrus. This facilitates the assimilation of traumatic memory into general cortical semantic networks, which leads to a reduction in the intensity of the episodic memory mediated by the hippocampus and the negative affect mediated by the amygdala. He postulates that the EMDR stimulation activates the lateral cerebellum, which in turn seems to activate the ventrolateral and central lateral thalamic nuclei, which seems to activate the left dorsolateral prefrontal cortex. This process seems to facilitate the assimilation of traumatic memory into general semantic and neocortical networks.

Similarly, Stickgold (2002) postulated that eye movement induced neurobiological changes similar to those found in the REM sleep state. The constant redirecting of attention across the midline of hemispheres by visual, tactile or auditory bilateral stimulation induced a

neurobiological mechanism similar to REM sleep. This activates the episodic memory and supports the integration of traumatic memory into general cortical semantic networks. This leads to the decrease in the intensity of episodic memories, mediated by the hippocampus, and negative affect, mediated by the amygdala.

Christman, Garvey, Propper and Phaneuf (2003) reported that bilateral stimulation encourages interaction between the cerebral hemispheres and facilitates the retrieval of episodic memory and resulting improvements. However, improvements were not seen in semantic and implicit memory with stimulus between hemispheres. They hypothesised that the visual bilateral stimulation activates the left and right hemispheres in parallel, which is presumed to enhance interhemispheric connectivity and processing. They postulate that this in turn leads to the improvements in explicit, episodic memory (Christman & Propper, 2001).

2.4.2.6 Neurological changes

In a pilot study on the neurological effects of EMDR treatment, van der Kolk, Burbridge and Suzuki (1997) found that the improvements in post traumatic stress symptoms were not the result of decreases in the activity of the amygdala that informs the emotive response, but rather the result of increases in the bilateral activity of the anterior cingulate gyrus and the prefrontal cortex. They postulate that the improvements were likely the result of the capacity to differentiate between genuine threats and triggers that were no longer valid.

The findings of Levin, Lazrove and van der Kolk (1999), were consistent with the findings of van der Kolk et al. (1997). They reported that there was an increase in activity in the anterior cingulate gyrus and left prefrontal lobe with the improvements in post traumatic stress symptoms following EMDR treatment. They believe that rather than reducing the arousal of the limbic system, EMDR improved the capacity to distinguish between real and perceived threats.

Drevets and Raichle (1998) suggested that the lower anterior region of the anterior cingulate cortex is activated in emotional processing, whereas the upper anterior region of the anterior cingulate cortex is activated in cognitive processing. Corrigan (2002) suggests that the alternating bilateral stimulation in EMDR restores the bilateral activity needed to re-establish the reciprocal relationship between the cognitive and the affective subdivisions of the anterior cingulate cortex. He postulates that initially there is an increase in activity in the affective region of the anterior cingulate, amygdala and the cognitive region of the anterior cingulate, which corresponds to the initial increase of disturbance when processing begins, using alternating bilateral stimulation. However, the activity in the affective region of the anterior cingulate decreases while the activity in the cognitive region of the anterior cingulate increases as the reciprocal relationship is restored in the anterior cingulate cortex, while the disturbing material is brought to an adaptive resolution using EMDR.

Lansing, Amen, Hanks and Rudy (2005) report a number of neurological changes following EMDR treatment. They report deactivation in three areas they believe to reduce trauma-induced grief, which is seen to correspond with the area Gündel, O'Connor, Littrell, Fort and Lane (2003) associated with image-induced grief, namely the left cuneus, the right lingual gyrus and Brodmann's area (BA) 4 of the right precentral gyrus. In addition to these decreases in activity in the right hemisphere, their analyses showed increases in activity in three left prefrontal Brodmann areas 4, 11, and 44, which appear to be correlated with the decrease in post traumatic stress symptoms. Also the increases in activity in the dorsolateral prefrontal cortex appear to be correlated with the decrease in symptoms of depression.

Kaye (2007) postulates that if the lower ventral anterior cingulate cortex is overwhelmed with intense emotions, then it is likely that the upper dorsal anterior cingulate cortex experiences such severe reciprocal suppression that it would be unable to process the contextual information, because no new information would be able to enter the system. The

effect would be that strong associations would have a tendency to perseverate. Kaye (2007) postulates that the lower anterior cingulate cortex would experience a reciprocal suppression, if the upper anterior cingulate cortex was activated by divided attention and/or error monitoring, which would allow new contextual information to be processed. Kaye (2007) postulates that the eye movement in EMDR is a visual tracking task that demands divided attention and/or error monitoring and would provide that reciprocal suppression of the ventral anterior cortex needed to allow the processing of contextual information, and in turn, the intensity of the disturbing memories would reduce.

2.4.2.7 Affect/Valence hypothesis

Valence, or the intensity of affect, is considered a core building block of emotional experience and a core component of emotional response in the interaction with the environment (Barrett, 2006a; Barrett, 2006b; Barrett, 2006c). Shapiro (2001) speculated that the activation of a core affect would activate the associate memory network because associative memory networks are organised around core affects. Shapiro (2001) added that the stronger the valence of the core affect, the stronger the associations in the neural network around the core affect, the more stable and habitual the emotional response in the interaction with the environment, and the less likelihood of associations with more adaptive networks. Shapiro (2001) postulates that EMDR provides a mechanism to reduce the intensity of the disturbance of the core affect, which in turn reduces or weakens the strong associations of the neural networks surrounding the highly negative valence of the core affect. This provides an opportunity to make progressive associations with networks with more positive valence. Shapiro (2001) speculates that EMDR catalyses cellular mechanisms that inhibit the protein function in the amygdala, as tested in animals (Nader, Schafe, & LeDoux, 2000). This prevents the conditioned response of the highly negative valence of the core affect, which

leads to the weakening of the associations. The weakened associations present an opportunity to formulate and strengthen associations with more adaptive, positive associations.

The researcher of this study (Bodill, 2009) uses the analogy of the strong gravitation pull in our immediate solar system, which keeps the planets in a particular pattern and prevents them from ‘floating off’ into another solar system. The stronger the gravitation pull, the more definite the pattern of response. However, should the gravitation pull in our immediate solar system weaken, then the planets are presented with an opportunity to be ‘attracted’ by a stronger neighbouring gravitational pull to join another solar system. Similarly, Bodill postulates that a weakening in the negative valence of a disturbing affect may provide an opportunity to be ‘attracted’ by positive adaptive material that has a stronger valence.

Shapiro (2001) postulates on further clinical applications of the affect/valence hypothesis in EMDR. For instance, dream images, or nightmares, are symbolic representations produced in REM sleep in an effort to process the highly disturbing affect. As EMDR weakens strong associations of the highly disturbing symbolic representations in dreams, links can be made with images of other traumatic events without symbolic distortions. For instance, a person may wake at night with a terrifying sensation of flying through the air and during EMDR come to realise that it is the same sensation experienced when flying through the air in a motorbike accident. Shapiro (2001) explains the same process may occur with other symbolic constructions and relates a case of a person with an intrusive memory of being raped by Satan who came to realise, during the processing of EMDR, that the rapist wore horns during the assault.

Shapiro (2001) also postulates that the affect/valence hypothesis offers an explanation to increasing self-destructive behaviour. She suggests that people engage in destructive behaviour because the levels of subjective pain associated with these behaviours are similar to

the highly negative valence of the core affect. However, the negative valence of the destructive behaviour reduces as it is desensitised through exposure to that behaviour. The person then seeks out even more destructive behaviour that matches the highly negative valence of the core affect.

Barrett (2006a) speculates that valence of the core affect can be affected by the valence focus, or the perceptual sensitivity in the process of evaluating whether the environment is helpful or harmful. This author postulates that EMDR may suspend a high valence focus sufficiently for the person to be able to re-evaluate that a past image is no longer harmful.

2.4.2.8 Frequency

Rasolkhani-Kalhorn and Harper (2006) claim that the frequency of alternating bilateral stimulation selected on the Advanced Tac/Audio Scan bilateral stimulation machine often falls within the range from 0.5 – 1.5 Hz. According to Huerta and Lisman (1996), this frequency is successful in depotentiating memory traces in synapses in laboratory analysis. Rasolkhani-Kalhorn and Harper (2006) speculate that the low frequency of the alternating bilateral stimulation in EMDR similarly depotentiates the fear element from traumatic memories. As a result, the intensely emotive input from the amygdala decreases allowing the anterior cingulate cortex to select the more logical response that is mediated by the hippocampus. As the person can consider the event without fear, processing in the Broca's area can continue so that a narrative of the event can be established (van der Kolk, 1996).

2.5 Summary

This chapter briefly summarised the full protocol of the EMDR model, the nature of traumatic and non-traumatic memory, and the theoretical basis of the EMDR model. The

chapter also delineated possible psychological and neurobiological mechanisms of action to explain the change that occurs in EMDR treatment. The next chapter will outline the current research on the effectiveness of EMDR in the treatment of post traumatic stress, depression, anxiety disorders, dissociation and personality disorders. The findings of these research studies influenced the design of this research project.

Chapter 3: Current research in EMDR

This chapter will outline current research on the efficacy of EMDR on treating post traumatic stress, depression, anxiety, dissociation and personality disorders in adults. Whilst the efficacy of EMDR has been established for post traumatic stress disorder (PTSD), the efficacy of EMDR in treating depression, anxiety and dissociation has often come secondary in research studies. There has also been a small amount of research on the effects of EMDR treatment on personality traits and the number of sessions needed to reduce the subjective unit of disturbance to zero when using EMDR.

EMDR came under considerable scrutiny after Francine Shapiro (1989a, 1989b) published her initial papers on the results she achieved using EMDR. In her initial control study she assigned 22 participants to either EMDR or a modified flooding procedure that attempted to control for exposure. The participants had been either raped, molested or were combat veterans. Improvements for the EMDR group were reported in the form of reductions in the subjective unit of disturbance (SUD) and behaviour indicators as reported by the referring therapist and family members. Limitations of this study included lack of standardised assessment procedures, lack of blind independent assessment and EMDR was not controlled for. However, this study sparked off a substantial amount of independent research that has since established the efficacy of EMDR in the treatment of post traumatic stress disorder.

3.1 The effect of EMDR treatment on post traumatic stress

The National Institute of Clinical Excellence (NICE) in the United Kingdom is an independent organisation that decides which treatments are available on the NHS to make sure people have the same access to treatment regardless of where they live. NICE has recognised 12 randomised control studies that have effectively reduced the symptoms of post

traumatic stress using EMDR. All these studies took place at least three months after the reported trauma. Maxfield and Hyer (2002) outline ten methodological standards, which minimise the error of measurement, in their Revised Gold Standard (RGS) Scale, which was modified from the Foa and Meadows Gold Standard (GS) Scale (1997). These include: (1) clearly defined target symptoms with an inclusion and exclusion criteria; (2) reliable and valid measures with good psychometric properties; (3) use of blind independent assessors to reduce bias; (4) assessor training for interrater reliability; (5) manualised treatment to ensure consistent and reliable treatment delivery; (6) random assignment to treatment by at least two therapists; (7) checks for adherence to treatment for high fidelity; (8) no concurrent treatment; (9) multi-modal and interview measures; and (10) adequate length of treatment. They claim that the more rigorous the methodological standards, the larger the treatment effects.

In Jensen's (1994) randomised control study, 25 combat veterans were assigned to a waiting list control group (n = 12) or to two sessions of EMDR treatment (n = 13). The mean age of the veterans was 43 years and all had a clinically significant diagnosis of PTSD on the Structured Interview for PTSD (SI-PTSD). Exclusions to this study included psychosis, organic brain injury, unclear military background, motivational issues and symptoms that did not meet the criteria. Whilst there were improvements in the subjective unit of disturbance, suggesting a reduction in anxiety on exposure to specific traumatic material, no improvements were reported on the diagnostic measures. One of the criticisms levied at this study was that there were insufficient EMDR sessions, especially due to the multiple traumas experienced. Other limitations include concurrent treatment, lack of a trained blind independent assessor, invalid diagnostic measures that failed to detect small changes, poor fidelity check of adherence to the EMDR protocol and the waiting list control group were told they would not receive treatment.

Vaughan, Armstrong, Gold, O'Connor, Jenneke, and Tarrier (1994) compared the effects of eye movement desensitisation (EMD) (n = 12) with exposure therapy (n = 13) and applied muscle relaxation (n = 11) in their randomised control study. Eye movement desensitisation (EMD) was the model that preceded the eight phase EMDR model. All the participants met the criteria for a PTSD diagnosis and included 13 males and 23 females. The mean age was 32 years and ranged from 20 to 78 years old. Each group underwent three to five sessions of treatment with a variety of homework. The results indicated significant improvements in all experimental conditions. However, it was reported that the reductions were greater for the intrusive symptoms of PTSD in the EMD group. Seventy percent of all the participants no longer met the criteria for PTSD at the three-month follow-up. One of the strengths of the study was that blind independent assessments were carried out by trained assessors. However, some of the criticisms levelled are that the current EMDR protocol was not used and the exposure therapy used did not conform to the standard exposure design.

Marcus, Marquis and Sakai (1997, 2004) randomly assigned 60 participants to either 50 minute sessions of EMDR (n = 34) or Standard Kaiser Care (SKC) consisting of cognitive, behavioural and psychodynamic therapy (n = 33). The mean age of the 53 women who participated was 40 years and ranged from 18 to 73 years old. The mean age of the 14 men who participated was 45 years and ranged from 23 to 67 years old. All met the diagnosis of PTSD according to the DSM-III-R. Exclusions included dissociative disorders, obsessive compulsive disorder (OCD), psychosis, substance abuse and suicide ideation. Participants also had to be stable on their medication to participate. After three sessions, 20% of the participants receiving SKC no longer presented with PTSD symptoms compared to 50% of the EMDR participants. The posttreatment measures indicated that 50% of participants receiving SKC no longer met criteria for PTSD compared to 77% of participants undergoing EMDR (including 100% who experienced a single trauma). The results were also

significantly improved for the EMDR groups at the three- to six- month follow-up.

Limitations of this study include an assessor who was not blinded and a number of participants had additional appointments related to their medication. However, the study had a high fidelity as the EMDR clinician had been assessed before treatment.

Rothbaum (1997) completed a randomised control study in which 18 women who had been sexually assaulted were assigned to either a waiting list control group (n = 8) or seven 90-minutes sessions of EMDR (n = 10). The mean age of the participants was 35 years. People dependent on drugs and alcohol were excluded from the study. All the participants met the diagnosis for PTSD according to the DSM-III-R criteria. At posttreatment, the assessment revealed that 90% of the participants who underwent EMDR no longer met the full criteria for PTSD as compared to 12% of participants in the waiting list control group. The results were maintained at a three-month follow-up. The strengths of this study include a blind independent assessor who used both self-reporting measures and structured interviews. Fidelity was also seen as acceptable. Some limitations to this study include a small sample, five participants underwent concurrent treatment, and Rothbaum was the only clinician for the initial EMDR condition, but the therapist effects were mitigated by the addition of another clinician for the delayed treatment condition.

In their randomised control study, Carlson, Chemtob, Rusnak, Hedlund, and Muraoka (1998) assigned 35 Vietnam combat veterans to three different experimental conditions, namely 12 sessions of EMDR (n = 10), 12 sessions of biofeedback-assisted relaxation (n = 13) or routine clinical care control (n = 12). All the participants met the DMS-IV criteria for PTSD. The mean age was 48 years and ranged from 41 to 70 years old. The EMDR groups had a significant decrease in PTSD symptoms on the posttreatment assessment when compared to the waiting list, and at the three-month follow-up when compared to the biofeedback-assisted relaxation group. Altogether 78% of participants undergoing EMDR no

longer met the criteria for PTSD. The strength of the study was a positive fidelity by an external assessor, a blind independent assessment at nine-month follow-up and sufficient number of sessions to achieve an effect.

Scheck, Schaeffer, and Gillette (1998) randomly assigned 60 women to either two 90-minute sessions of EMDR (n = 30) or active listening (n = 30), combined with journal writing at home. Seventy seven percent of these participants met the criteria for PTSD and 90% reported physical or emotional abuse as a child. The mean age was 21 years and ranged from 16 to 25 years old. The results of the study indicated that the improvements in PTSD symptoms were significantly greater for EMDR than the active listening group and the effects were maintained at the three-month follow-up. However, the post treatment measure did not include the structured diagnostic interview assessment. Strengths of this study include a blind independent assessor and EMDR with a high-risk population. However, limitations included too few EMDR sessions and the fidelity of some of the EMDR clinicians was not assessed before the study.

Deville and Spence (1999) compared the effects of EMDR (n = 11) with a Trauma Treatment Protocol (TTP) (n = 12) a CBT variant containing imaginal exposure therapy, in vivo exposure, stress inoculation training and cognitive restructuring based on the model by Foa, Rothbaum, Riggs, & Murdock (1991). Twenty three participants completed treatment. Eight males and 17 females with a mean age of 38 years, all of whom met the criteria for PTSD, were assigned in non-random blocks to eight sessions of treatment. Whilst both EMDR and TTP were significantly effective on all measures, TTP was reported to be clinically and statistically more effective than EMDR on measures of PTSD. The results for TTP compared to EMDR were not only maintained, but seen as even more superior at the three-month follow-up. Limitations of the study include a lack of an independent blind

assessor, 31% of the EMDR participants dropped out of the study before treatment and EMDR treatment fidelity was low because of lack of conformity to the standard protocol.

The randomised control study by Ironson, Freund, Strauss, and Williams (2002) compared the effects of EMDR with prolonged imaginal exposure therapy. All of the 22 participants were diagnosed with PTSD in accord with the DSM-III-R (1987). Five subjects were male and 17 were female, with their ages ranging from 16 to 62 years old. They were randomly assigned to an EMDR treatment group (n = 10) or a prolonged exposure group (n = 12). The EMDR treatment consisted of three non-active sessions, which consisted of an assessment, psychoeducation, relaxation training and in vivo exposure homework, and three active EMDR sessions. The prolonged exposure consisted of three non-active sessions, which comprised an assessment, psychoeducation, relaxation training and in vivo exposure homework, and three active prolonged exposure sessions together with in vivo homework and tape listening. Seventy percent of the participants experienced a reduction in their PTSD symptoms in the EMDR group compared to a 17% of participants in the prolonged exposure group. This was based on a 70% reduction of symptoms. In addition, EMDR seemed to be tolerated more easily as no one dropped out of the EMDR group compared to 25% of the participants who dropped out of the prolonged exposure group. Treatment effects were maintained at three-month follow-up for both EMDR and prolonged exposure. The fidelity of this study was deemed as acceptable. Limitations include lack of blind independent assessors; however the effects were minimised by the use of self-reporting assessments. Another limitation was that no structured PTSD interviews were used to assess treatment outcomes, which is seen as being one of the better methods of assessing PTSD symptoms (Tarrier, 2001).

In their randomised control study, Lee, Gavriel, Drummond, Richards, and Greenwald (2002) compared the effects of EMDR with stress inoculation training with prolonged

exposure (SITPE). They randomly assigned 22 people, who were all diagnosed with PTSD, to seven 90-minute sessions of EMDR (n = 12) or SITPE (n = 10) treatment, using their waiting list period as a control. Thirteen of the participants were males and 11 were female. The mean age was 35 years. Exclusions for this study were psychosis, active drug and alcohol dependence, personality disorders, insufficient symptoms, and previous EMDR or SITPE treatment. The post treatment assessment indicated that both treatments were effective, with 75% of the participants who underwent SITPE and 83% who underwent EMDR no longer meeting the criteria for PTSD. At the three-month follow-up, 83% of both treatments no longer met the criteria for PTSD. However, with regard to the intrusive symptoms, EMDR had a significant larger improvement compared to SITPE. Whilst the EMDR participants were required to complete three hours of homework, the SITPE participants were required to do 28 hours of homework, which could point to EMDR being more effective. The strength of this study was that EMDR was compared to an empirically validated treatment and the fidelity of this study was high. However, the assessor was not independent or blind.

In the study by Power, McGoldrick, Brown, Buchanan, Sharp, Swanson, and Karatzias (2002), 105 patients with PTSD were randomly assigned to three different groups, waiting list (n = 37), EMDR (n = 39) and exposure plus cognitive restructuring (n = 37) and 72 participants completed treatment. All the participants met the criteria for PTSD and were randomly assigned to 10 sessions of EMDR, exposure plus cognitive restructuring or to a waiting list control. The results indicated that there was a significant and substantial reduction on all PTSD measures for EMDR and the exposure plus cognitive restructuring participants. These improvements were maintained at the 15-month follow-up. Strengths of this study included randomisation, adequate fidelity and blind independent assessment.

In their randomised control study, Taylor, Thordarson, Maxfield, Fedoroff, Lovell, and Ogrodniczuk (2003) assigned 60 participants to three different conditions, namely eight 90- minute sessions of EMDR (n = 19), relaxation training (n = 19) or exposure therapy consisting of in vivo and imaginal exposure (n = 22). All were diagnosed with PTSD according to the DMS-IV (1994). Seventy five percent of the participants were women and the mean age was 37 years. Exclusions included people with learning difficulties, active psychosis and a change in medication three months prior to the study. The results of the study indicated that exposure therapy was more efficacious in reducing the avoidance and reexperiencing symptoms compared to EMDR. In addition, exposure therapy was seen to reduce the avoidance symptoms more rapidly than EMDR. More participants who underwent exposure therapy no longer met the DSM-IV PTSD criteria compared to the participants who underwent EMDR. Exposure therapy was therefore seen to be superior to EMDR and relaxation training. The strength of this study is that EMDR was compared to exposure therapy that is already a benchmark treatment for PTSD (Chambless & Ollendick, 2001). In addition, this study met all of the gold standards for treatment-outcome research as set by Foa and Meadows (1997). Limitations of this study are that the participants all presented with severe, chronic PTSD and the results may not generalise to less chronic symptoms. In addition, the clinicians had more experience in delivering the exposure therapy when compared to the EMDR.

Rothbaum, Astin, and Marsteller (2005) compared 74 female rape victims randomly assigned to either EMDR or prolonged exposure therapy or a no-treatment waiting list control group. The EMDR protocol was adapted to nine 90-minutes sessions to match the nine session prolonged exposure therapy protocol. The mean age was 39 years. Improvements in PTSD symptoms were significant in both EMDR and prolonged exposure compared to the waiting list control group. Ninety five percent of participants who underwent prolonged

exposure no longer met the PTSD criteria compared to 75% of participants who underwent EMDR, suggesting that prolonged exposure is slightly, but not significantly, more effective than EMDR. The effects were maintained at the six-month follow-up in both EMDR and prolonged exposure; however, the prolonged exposure participants reported higher end-state functioning compared to the EMDR participants (78% versus 35%). In conclusion, both EMDR and prolonged exposure were seen to be clinically and significantly effective in treating posttraumatic stress, which differs from the results of Taylor et al. (2003). The goal of this study was to compare 'good prolonged exposure therapy' to 'good EMDR', so fidelity was high. The study also met all seven requirements of gold standard for treatment outcome research delineated by Foa and Meadows (1997).

A number of studies have also researched the effects of EMDR on the symptoms of PTSD, but did not meet the NICE standard for a randomised control study or were completed after the NICE guidelines were formulated.

In a randomised control study, Van der Kolk et al. (2007) assigned 88 participants to one of three different treatment conditions, namely; EMDR, fluoxetine or a pill placebo for the treatment of post traumatic stress disorder. The age of participants ranged from 18 to 65 years. Participants in the EMDR treatment condition underwent six 90-minute sessions of EMDR over a period of eight weeks. The results post treatment indicate that 88% of the EMDR treatment group no longer met the criteria for post traumatic stress disorder when compared to 81% of the fluoxetine group and 65% of the pill placebo group. However, 29% of the EMDR treatment group became asymptomatic compared to 15% of the fluoxetine group and 12% of the placebo group. At the six-month follow-up, 57% of the EMDR group were asymptomatic compared to none in the fluoxetine group. In addition, 75% of adult-onset trauma became asymptomatic in the EMDR group compared to 33.3% of the child-

onset trauma. Strengths of the study were the randomised control, high fidelity checks, and blind independent assessors.

In a pilot study, Boudewyns, Stwertka, Hyer, Albrecht and Sperr (1993) randomly assigned 20 combat veterans to two sessions of EMDR (with eye movements) with group therapy, EMDR (with eyes closed) with group therapy, or group therapy alone. The group therapy was standard care in the veteran hospital. Whilst there were no significant improvements on clinical assessments, the participants reported an improvement in their subjective level of distress, which led to the commissioning of a more extensive study using EMDR. Limitations of this study included insufficient EMDR sessions, no fidelity checks and issues related to secondary gains. In the more extensive study, Boudewyns & Hyer (1996) randomly assigned 61 combat veterans to either EMDR (with eye movements) with group therapy, EMDR (with eyes closed) with group therapy, and group therapy alone. All the participants received eight sessions of group therapy, but those in the EMDR condition also received an additional five to seven sessions of EMDR. While there were significant improvements in post traumatic stress in the EMDR groups, there were also significant improvements in the other groups. However, one of the limitations of this study is too few sessions for participants with multiple traumas.

In an attempt to understand the role of eye movements in EMDR, Renfrey and Spates (1994) compared eye movements (produced by fingers), with eye movements (produced by a light tracking bar) and with no eye movements. Twenty one of their 23 participants met the criteria for the PTSD and underwent six sessions of therapy. Improvements were reported in all three experimental conditions. The results of the study indicated that 85% of the eye movement group no longer displayed symptoms of PTSD compared to 57% of participants in the no eye movement group. Limitations of this study were a lack of fidelity, no independent blind assessor and a small number of participants in each experimental condition.

In their control study Wilson, Becker and Tinker (1995, 1997) assigned 80 participants, 40 males and 40 females with a mean age of 39 years, to EMDR and a delayed treatment group. Whilst a variety of symptoms were measured, only 32 participants met the criteria for PTSD, which was less than 70% of participants. The results of the study indicated a clinically significant improvement in all symptoms measures, with a move into the normal range for all measures. In addition, 84% no longer met the criteria for PTSD at the 15-month follow-up assessment. The strength of this study was the high fidelity to the EMDR treatment, blind independent assessment and a large sample.

Wilson, Silver, Covi, and Foster (1996) compared the effects of eye movements, hand taps and an exposure-only condition. The 18 participants were randomly assigned to the one session of treatment and significant reductions were found on physiological measures and in the subjective level of disturbance. The strength of this study was the high fidelity to treatment. However, limitations included insufficient sessions and lack of standardised assessment and diagnostic measures.

Pitman, Orr, Altman, Longpre, Poire, and Macklin (1996) used a crossover design in which 17 combat veterans were randomly assigned to EMDR with eye movements and EMDR with a combination of eyes fixed, hand taps and the hand movement of the therapist in the line of the participant's vision. Each participant was able to undergo six sessions of therapy per memory of a single event from a multiple number of traumas. There was a significant reduction in the self-reported distress and a modest to moderate reduction on the Impact of Event Scale. The EMDR with eyes fixed conditions saw a slightly greater improvements compared to the EMDR with eye movements. Limitations of this study include a small sample size and variable fidelity to EMDR treatment. A 5-years follow-up study (Macklin, Metzger, Lasko, Berry, Orr, & Pitman, 2000) revealed that the gains were not maintained and all (n=13) still met the criteria for the diagnosis of post traumatic stress

disorder. One of the limitations of this study is the lack of control for other treatment during the five years.

In their research study, Devilly, Spence, and Rapee (1998) assigned 51 combat veterans with symptoms of post traumatic stress disorder to one of three treatment conditions, namely; EMDR (with eye movement), EMDR (with eyes stationary) or standard psychiatric support. Each participant underwent two sessions of treatment and there was a reduction in symptoms for all groups, with no statistical difference between the groups. On measures of reliable change, 67% of the EMDR (with eye movement) were reliably improved compared to 42% in the EMDR (with eyes stationary) and 10% of the standard care. However, the improvements in symptoms had dissipated at the six-month follow-up with no reliable difference in the treatment groups. Limitations included incomplete randomization, insufficient sessions for chronic PTSD and poor fidelity to EMDR treatment.

Sprang (2001) compared the effects of EMDR treatment (n=23) to guided mourning treatment (N=27). Participants were able to choose the treatment condition they preferred. The number of sessions for each participant varied, with guided mourning requiring considerably more sessions than EMDR (10.68 sessions compared to 6.19 sessions). There were significantly more improvements in the EMDR condition compared to the guided mourning, especially with the symptoms of avoidance, intrusion, anxiety and post traumatic stress. However, the guided mourning group had more improvements in self-esteem compared to the EMDR group. These gains were maintained at the nine-month follow-up. Strengths of this study include fidelity checks, blind independent evaluation, and sufficient sessions. Limitations include lack of randomisation.

3.1.1 Summary of post traumatic stress research

To date the majority of the research has focused on the effects of EMDR in the treatment of post traumatic stress. NICE UK has recognised 12 randomised control studies that have significantly reduced the symptoms of post traumatic stress using EMDR. Nine of these 12 studies reported clinically significant improvements in post traumatic stress with EMDR and the gains were maintained at follow-up (Vaughan et al., 1994; Rothbaum, 1997; Marcus et al., 1997; Carlson et al., 1998; Scheck et al., 1998; Ironson et al., 2002; Lee et al., 2002; Power et al., 2002; Rothbaum et al., 2005). One of the 12 studies reported no improvements in combat veterans with two sessions of EMDR (Jensen 1994). One study reported that EMDR was significantly effective in reducing the symptoms of post traumatic stress but TTP was seen as more effective than EMDR treatment, while at follow-up EMDR seemed to maintain the gains more effectively than TTP (Deville & Spencer, 1999). One of the twelve studies reported that EMDR is not as effective as exposure in reducing the symptoms of post traumatic stress (Taylor et al. 2003).

The trends that emerged from the 12 randomised studies recognised by NICE UK indicate that EMDR is more effective than the waiting list control (Rothbaum, 1997; Carlson et al., 1998; Rothbaum et al., 2005), biofeedback with assisted relaxation (Carlson et al., 1998); active listening (Scheck et al., 1998), standard Kaiser care (Marcus et al., 1997, 2004), prolonged exposure (Ironson et al., 2002), and stress inoculation with prolonged exposure (Lee et al., 2002), in reducing symptoms of post traumatic stress. However, the research also seems to indicate that EMDR is not as effective as in vivo and imaginal exposure (Taylor et al., 2003) and prolonged exposure (Rothbaum et al., 2005).

Nine other studies also researched the effectiveness of EMDR treatment in reducing the symptoms of post traumatic stress but did not meet the NICE standards. Eight of these nine studies reported significant improvements on clinical, physiological and self-reporting

assessments in the EMDR condition with eye movements (Renfrey & Spates, 1994; Wilson et al., 1995, 1997; Boudewyns & Hyer, 1996; Pitman et al., 1996; Wilson et al., 1996; Devilly et al., 1998; Sprang, 2001; van der Kolk et al., 2007). Three studies reported that gains were maintained at follow-up (Wilson et al., 1995, 1997; Sprang, 2001; van der Kolk et al., 2007). Two of the nine studies reported that gains were not maintained at follow-up (Pitman et al., 1996; Devilly et al., 1998). These nine studies compared EMDR (with eye movements) to a variety of other conditions: fluoxetine and pill placebo (van der Kolk et al., 2007), EMDR with eyes closed (Boudewyns & Hyer, 1993), EMDR with eyes tracking light bar (Renfrey & Spates, 1994), EMDR with fixed eyes (Renfrey & Spates, 1994; Pitman et al., 1996; Devilly et al., 1998), EMDR with hand taps (Wilson et al., 1996; Pitman et al. 1996), delayed treatment (Wilson et al., 1995, 1997), exposure therapy (Wilson et al., 1996) and guided mourning (Sprang, 2001).

EMDR has become the most researched psychological treatment for post traumatic stress. In the United Kingdom, EMDR is listed by the National Institute of Clinical Excellence (NICE, 2005) as one of the excellent treatments for post traumatic stress, alongside cognitive behavioural therapy (CBT) (United Kingdom Department of Health, 2001). In a number of other countries, EMDR has also become a treatment of choice for post traumatic stress. The American Psychiatric Association has recommended EMDR as an effective treatment for psychological trauma (American Psychiatric Association, 2004). The Veterans Health Administration in the USA placed EMDR in the 'A' category and strongly recommends EMDR as a treatment for trauma (Department of Veterans Affairs & Department of Defence, 2004). The International Society of Traumatic Stress Studies has also given EMDR an 'A' rating as an effective treatment for post traumatic stress (Foa, Keane, & Friedman, 2000). In Israel, EMDR is one of three psychological treatments recommended for the treatment of terror victims (Bleich, Kotler, Kutz, & Shalev, 2002). In Ireland, the

Netherlands and France, EMDR and CBT have been made the treatment of choice for trauma (CREST, 2003; Dutch Steering Committee Guidelines Mental Health Care, 2003; INSERM, 2004).

The above research studies informed the design of this research study. For instance, one of the criticisms was insufficient EMDR treatment sessions (Boudewyns, Stwertka, Hyer, Albrecht & Sperr, 1993; Jensen, 1994; Vaughan, Armstrong, Gold, O'Connor, Jenneke, & Tarrier, 1994; Pitman, Orr, Altman, Longpre, Poire, & Macklin, 1996; Wilson, Silver, Covi, & Foster, 1996; Devilly, Spence, & Rapee, 1998; Scheck, Schaeffer, & Gillette, 1998). Hence the design of this study provided sufficient EMDR treatment sessions to reduce the subjective unit of disturbance (SUD) to zero for up to four traumas. In addition, because it has been established that EMDR is efficacious with post traumatic stress, post traumatic stress (per se) will not be the primary focus of the research. Instead the research will focus on the effects of EMDR treatment on clinical personality patterns, severe personality patterns, depressive constructs, other clinical syndromes, severe clinical syndromes and dissociation.

3.2 The effect of EMDR treatment on depression

To date there have been no randomised control studies that have studied the efficacy of EMDR treatment with depression (Maxfield, 2007). In the main, the study of the reduction of depressive symptoms using EMDR has been a secondary measure in post traumatic stress studies. Most of these studies have used the Beck Depression Inventory (BDI), which is a 21 item self-report scale, to assess the severity of depression (Beck & Steer, 1993). The BDI has a good to excellent reliability and validity. A strong internal consistency has been demonstrated with split-half reliabilities that range from .78 to .93. The test-retest reliability is also good, ranging from .48 for psychiatric patients after three weeks to .74 for college students after four months (Corcoran & Fischer, 1987). One study (Vaughan et al., 1994)

used the Hamilton Rating Scale for Depression (HRSD), which is a 21 item self-report scale designed to assess the severity of depression (Hamilton, 1960). Another study (Power et al., 2002) used the Montgomery Asberg Depression Rating Scale (MADRS) (Montgomery & Asberg, 1979) and the Hospital Anxiety and Depression Scale (HADS) (Zigmond & Snaith, 1983) to measure the effects of EMDR on depression.

Vaughan et al. (1994) compared the effects of eye movement desensitisation (EMD) (n = 12) with exposure therapy (n = 13) and applied muscle relaxation (n = 11) in their randomised control study. All the participants met the criteria for a PTSD diagnosis and each group underwent three to five sessions of treatment with a variety of homework. Six participants met the criteria for a diagnosis of major depression on the HRSD. The results indicated that there was an improvement in the HRSD scores posttreatment, with a trend of favouring EMD ($t = 3.95, p = .002$) over applied muscle relaxation ($t = 2.71, p = .022$). These results were maintained at follow-up.

The measurement of depressive symptoms were secondary to post traumatic stress in the study by Marcus et al. (1997, 2004), and were measured using the BDI. Sixty seven people were randomly assigned to either 50 minute sessions of EMDR (n = 34) or Standard Kaiser Care (SKC) consisting of cognitive, behavioural and psychodynamic therapy (n = 33). The EMDR group displayed significantly greater improvements for symptoms of depression between the measurements at pretest to the test after three sessions ($p = .03$) and the measurements at pretest to post treatment ($p = .001$), compared to the Standard Kaiser Care group.

Rothbaum (1997) completed a randomised control study in which 18 women who had been sexually assaulted were assigned to either a waiting list control group (n = 8) or four 90-minute sessions of EMDR (n = 10). All the participants met the diagnosis for PTSD according to the DSM-III-R criteria, and depression was a secondary measure. The results of

the self-report depression scores on the BDI were significantly superior to the waiting list controls, as they showed a mean decrease of more than two standard deviations at the post treatment assessment.

Scheck et al. (1998) also measured the effects of EMDR on depressive symptoms in their randomised control study of 60 women assigned to either two 90-minute sessions of EMDR (n = 30) or active listening (n = 30), combined with journal writing at home. The symptoms of depression were measured using the BDI. The results of the study indicated the decrease in depressive symptoms was significantly greater for EMDR than for the active listening group and the effects were maintained at the three-month follow-up.

Carlson et al. (1998) also measured the symptoms of depression in their randomised control study of 35 Vietnam combat veterans who were assigned to three different experimental conditions, namely 12 sessions of EMDR (n = 10), 12 sessions of biofeedback-assisted relaxation (n = 13) and routine clinical care control (n = 12). All the participants met DSM-IV criteria for PTSD. The symptoms of depression were measured by BDI and revealed a significant decrease in severity at the post treatment assessment in the EMDR groups versus the waiting list control group. However, the decrease in the EMDR group was not significantly lower than the biofeedback-assisted relaxation group at the post treatment assessment.

Edmonds, Rubin, and Wambach (1999) randomly assigned 59 women who reported childhood sexual abuse to either six sessions of EMDR (n = 20) or routine individual therapy (n = 20) or a delayed treatment control group (n = 19). The mean age of the participants was 35 years. The results of the study indicated that the EMDR participants scored significantly better than the control group on all measures of trauma specific post traumatic stress, depression, and negative beliefs. EMDR was seen to be more effective than the routine interventions at the three-month follow-up. However, the results of the BDI on a separate

univariate analysis of variance fell short of statistical significance ($p < .07$) at the 0.05 level at the posttreatment assessment. However, the gains obtained at posttreatment assessment were maintained at the three-month follow-up for the EMDR compared to routine interventions which were not so dramatically maintained.

Devilley and Spence (1999) compared the effects of EMDR ($n = 11$) with a Trauma Treatment Protocol (TTP) ($n = 12$), which was a combination of imaginal exposure therapy, in vivo exposure, stress inoculation training and cognitive restructuring based on the model by Foa, Rothbaum, Riggs, & Murdock (1991). The PTSD symptoms were primary measures while the depressive symptoms on the BDI were secondary measures. Twenty three participants completed treatment. Whilst both EMDR and TTP were significantly effective on all measures, the results indicated that TTP was more effective than EMDR in reducing depressive symptoms. They also reported that the EMDR gains tended to dissipate over time, whilst the TTP participants continued to make gains.

In the study by Power et al. (2002), all the participants met the criteria for PTSD. Seventy two participants who had completed the treatment had been randomly assigned to three experimental conditions, namely, either 10 sessions of EMDR or exposure plus cognitive restructuring or to a waiting list control. The depressive symptoms were measured using the Montgomery Asberg Depression Rating Scale (MADRS) and the Hospital Anxiety and Depression Scale (HADS). The results indicated that the EMDR participants reported a greater reduction in the self-reported depression scores at posttreatment and more of a clinically significant improvement in assessor-rated levels of depression at 15-month follow-up compared to the exposure and cognitive restructuring group.

The randomised control study by Ironson et al. (2002) compared the effects of EMDR ($n = 10$) with prolonged imaginal exposure therapy ($n = 12$). Both the EMDR treatment and the prolonged exposure treatment consisted of three non-active sessions and three active

sessions. The symptoms of depression were measured using the BDI pretest, posttreatment and at the three-month follow-up. The results of the BDI suggest that both EMDR and the prolonged exposure treatment were significantly effective in reducing the depressive symptoms, with one not being more effective than the other. The effects were maintained at the three-month follow-up.

Lee et al. (2002) compared the effects of EMDR and stress inoculation training with prolonged exposure (SITPE) on the symptoms of depression. They randomly assigned 22 people, who were all diagnosed with PTSD, to seven sessions of 90-minutes of EMDR (n = 12) or SITPE (n = 10) treatment, using their waiting list period as a control. The depressive symptoms were assessed using the BDI. The results indicated a significant improvement in the symptoms of depression in both the EMDR and the SITPE conditions.

In their randomised control study, Taylor et al. (2003) assigned 60 participants to three different conditions, namely eight 90-minute sessions of EMDR (n = 19), relaxation training (n = 19) and exposure therapy consisting of in vivo and imaginal exposure (n = 22). All were diagnosed with PTSD according to the DMS-IV (1994) and the severity of the associated depression was assessed using the BDI. The results indicated a significant decline from the pretreatment to follow-up assessment. In addition, the EMDR scores tended to decline between posttreatment to follow-up compared to measures of dissociation and trauma-related guilt and anger that tended to remain stable.

Rothbaum et al. (2005) compared 74 female rape victims randomly assigned to either nine 90-minutes sessions of EMDR or prolonged exposure therapy or a no-treatment waiting list control group. The symptoms of depression were secondary measures in this study. The scores on the BDI indicated a significant decrease in depression from pretreatment to posttreatment for both EMDR and prolonged exposure therapy compared to the waiting list control. These effects were maintained at the six-month follow-up for both.

In a randomised control study, van der Kolk et al. (2007) assigned 88 participants to one of three different treatment conditions, namely; EMDR, fluoxetine and a pill placebo for the treatment of post traumatic stress disorder. Participants in the EMDR treatment condition underwent six 90-minute sessions of EMDR over a period of eight weeks. The severity of the depression was measured using the BDI. The results indicated that participants undergoing EMDR had significantly lower BDI scores than those in the fluoxetine group.

3.2.1 Summary of depression research

To date there have been no randomised control studies that have established the efficacy of EMDR with depressive symptoms, therefore NICE UK does not recognise EMDR as an effective treatment for depression. Eleven of the 12 randomised control studies on the effects of EMDR with post traumatic stress evaluated the effects of EMDR treatment on depression as a secondary measure. Nine of these 11 studies reported a significant reduction in depressive symptoms as measured by BDI with EMDR treatment (Marcus et al., 1997, 2004; Rothbaum, 1997; Scheck et al, 1998; Carlson et al, 1998; Devilly & Spence, 1999; Ironson et al., 2002; Lee et al., 2002; Taylor et al., 2003; Rothbaum et al., 2005). One of these eleven studies reported a significant reduction in depressive symptoms as measured by the Hospital Anxiety & Depression Scale (HADS) (Power et al., 2002) and another study reported an improvement in major depression as measured by the Hamilton Rating Scale for Depression (HRSD) (Vaughan et al., 1994).

There were two other studies that also evaluated the effects of EMDR on depression. One study reported a reduction in depressive symptoms but the results fell short of significance (Edmond et al., 1999), while the other study reported significantly lower BDI scores following EMDR treatment (van der Kolk et al., 2007). No studies into the effects of EMDR on depression reported no change in symptoms or an increase in symptoms.

As Maxfield (2007) pointed out, no EMDR research studies have focused on the efficacy of EMDR with major depression. Neither have there been any randomised control studies that have focused on the efficacy of EMDR with dysthymia and depressive personality pattern. The lack of studies on the efficacy of EMDR with different types of depressive constructs may reflect the difficulties in the current debate on the establishment of separate identities of depressive constructs that share descriptive similarities, in particular dysthymia and depressive personality disorder (Akiskal, 1983; DSM-IV, 1994; Hirschfeld, 1994; Huprich, 1998; Bagby & Ryder, 1999; Klein, 1999; Phillips & Gunderson, 1999; Ryder & Bagby, 1999; Widiger, 1999; Huprich, 2001; Ryder, Bagby, & Dion 2001; Ryder, Bagby & Schuller, 2002; Bagby, Ryder & Schuller, 2003; Ryder, Schuller & Bagby, 2006). While acknowledging that there are difficulties in the identification of these depressive constructs, the present study was designed to investigate the efficacy of EMDR treatment with major depression, dysthymia and depressive personality pattern. This comparison is made possible through the use of the Millon Clinical Multiaxial-III (MCMI-III), which provides a measure of these different depressive constructs.

3.3 The effect of EMDR treatment on anxiety disorders

Under the umbrella of anxiety disorders in the DSM-IV (1994) there are a variety of anxiety conditions, and these include generalised anxiety disorder, panic disorder with or without agoraphobia and a variety of phobias. This section will discuss the research findings of using EMDR to treat generalised anxiety disorder, panic disorder and phobias.

3.3.1 The effect of EMDR treatment on generalised anxiety disorder

To date there have been no randomised control studies that have studied the efficacy of EMDR treatment with generalised anxiety disorder (Maxfield, 2007). In the main, the

study of the reduction of anxiety symptoms using EMDR has been a secondary measure in post traumatic stress studies. Most of these studies have used the State-Trait Anxiety Inventory (STAI) which is a 40-item self-report measure that has two subscales. One subscale assesses state anxiety, the current transitory emotional condition or how a person feels 'right now' and the other subscale assesses trait anxiety, the relatively stable state of proneness to anxiety or how the person feels 'generally' (Spielberger, Gorsuch, Luchene, Vagg, & Jacobs, 1983). The STAI has good construct validity, with a good ability to discriminate between psychiatric and normal patients with anxiety symptoms. The internal consistency of the STAI is also very high with median alpha coefficients of .90 (Spielberger et al., 1983). As regards the state-anxiety scale, the test-retest reliability is relatively low, which may be expected when assessing situational stress (Spielberger et al., 1983). The STAI also has good concurrent validity with the IPAT Anxiety Scale and the Taylor Manifest Anxiety Scale. The correlations range from .73 to .85 (Spielberger et al., 1983). In one study (Vaughan et al., 1994) the Anxiety Disorder Interview Schedule Revised (Di Nardo & Barlow, 1988) was also used to obtain measures of generalised anxiety disorder (GAD) and panic disorder (PD).

Vaughan et al. (1994) compared the effects of EMD (n = 12), imaginal exposure therapy (n = 13) and applied muscle relaxation (n = 11) in their randomised control study. All their participants met the criteria for a PTSD diagnosis and each group underwent three to five sessions of treatment with a variety of homework. Eleven participants met the criteria for the diagnosis of panic disorder and 20 met the diagnosis of generalised anxiety disorder on the ADIS-R. With regard to panic disorder, there was a significant improvement in the EMD group, compared to the applied muscle relaxation group, with the elimination of the panic disorder. However, these results were not maintained, as one participant met the criteria for the diagnosis of panic disorder at three-month follow-up. There were improvements in the

generalised anxiety in both the EMD and the imaginal exposure therapy and these were maintained at the three-month follow-up.

In the randomised control study by Marcus et al. (1997, 2004), the reduction of anxiety symptoms using EMDR were secondary measures. The analysis of the STAI revealed that the EMDR group displayed significantly greater improvements for the trait anxiety between the measurements at pretest and the test after three sessions ($p = .013$) and the measurements at pretest and posttreatment ($p = .005$), compared to the Standard Kaiser Care group. However, with regard to the state anxiety, the EMDR group was significantly lower between the measurements at pretest and the test after three sessions ($p = .045$) and the measurements at pretest and posttreatment ($p = .065$), compared to the Standard Kaiser Care group.

In a randomised control study, Rothbaum (1997) assigned 18 women who had been sexually assaulted to a waiting list control group ($n = 8$) or four 90-minute sessions of EMDR ($n = 10$). Anxiety was a secondary measure. All the participants met the diagnosis for PTSD according to the DSM-III-R criteria. The results of the anxiety measures on the STAI revealed that there was no statistically significant decrease in the symptoms of anxiety, even though an improvement was noted.

Carlson et al. (1998) also measured the symptoms of anxiety using the STAI in their randomised control study of 35 Vietnam combat veterans. The participants were assigned to three different conditions, namely 12 sessions of EMDR ($n = 10$), 12 sessions of biofeedback-assisted relaxation ($n = 13$) and routine clinical care control ($n = 12$). All the participants met DSM-IV criteria for PTSD. The STAI was used to measure changes in the anxiety symptoms. While there were some decreases in the state anxiety subscale, these were not significant. However, on the trait-anxiety subscale, the EMDR group showed larger

decreases than the relaxation group at posttreatment and these decreases were maintained at the three-month follow-up.

In their randomised control study, Scheck et al. (1998) measured the effects of anxiety symptoms of 60 women assigned to either two 90-minute sessions of EMDR (n=30) or active listening with journal writing at home (n=30). While the symptoms of anxiety were measured using the STAI, only the state-anxiety subscale, or how the participant 'feels right now' was used in this study. The trait-anxiety subscale, or how the participant feels in general, was not used in this study. The results indicated a significant improvement in anxiety symptoms in the EMDR group compared to the active listening group and the effects were also maintained at the three-month follow-up.

Devilley and Spence (1999) compared the effects of EMDR (n = 11) with a Trauma Treatment Protocol (TTP) (n = 12), which was a combination of imaginal exposure therapy, in vivo exposure, stress inoculation training and cognitive restructuring based on the model by Foa, Rothbaum, Riggs, & Murdock (1991). The anxiety symptoms in this study, as measured on the STAI, were seen as secondary measures. Twenty three participants completed treatment and the results indicated that TTP was more effective than EMDR in reducing anxiety symptoms. They also reported that the EMDR gains tended to dissipate over time, whilst the TTP participants continued to make gains.

Rothbaum et al. (2005) compared 74 female rape victims randomly assigned to nine 90-minute sessions of EMDR or prolonged exposure therapy or a no-treatment waiting list control group. The symptoms of anxiety were secondary measures in this study. The scores on the STAI indicated a significant decrease in state and trait anxiety from pretreatment to posttreatment for both EMDR and prolonged exposure therapy compared to the waiting list control, and these effects were maintained at the six-month follow-up. There were also no significant differences between EMDR and prolonged exposure.

Edmond et al. (1999) randomly assigned 59 women who reported childhood sexual abuse to either six sessions of EMDR (n = 20) or routine individual therapy (n = 20) or a delayed treatment control group (n = 19). The anxiety symptoms were measured using the STAI and the results indicated a significant improvement at both the posttreatment assessment ($p < .0001$) and at follow-up ($p < .01$) for the EMDR group compared to the control group. However, whilst there was no statistical difference between the EMDR group and the routine intervention group at posttreatment, the EMDR condition was the only condition to maintain the gains at the three-month follow-up.

Sprang (2001) compared the effects of EMDR treatment (n = 23) to guided mourning treatment (n = 27). The anxiety symptoms were secondary measures that were investigated using the STAI. There was a significant improvement in anxiety in both groups, but there were more improvements in the EMDR condition. These gains were maintained at the nine-month follow-up.

3.3.2 The effect of EMDR treatment on panic disorder

Feske and Goldstein (1997) randomly assigned 43 participants to six sessions of EMDR (eye movements), EMDR (without eye movements) and a waiting list control. All the 43 participants met the criteria for the diagnosis of panic disorder on the DSM-3 and most also had agoraphobia. On all measures, the EMDR treatment effect was significantly superior to the waiting list control group posttreatment. However, it was reported that the gains dissipated at the three-month follow-up. Strengths were high fidelity to EMDR treatment and reliable assessment on valid self-report questionnaires.

Goldstein, de Beurs, Chambless, and Wilson (2000) conducted a randomised control study which compared EMDR (n = 18) with a waiting list (n = 14) and a credible attention-placebo (n = 13) group. Participants met the criteria for the diagnosis of panic disorder with

agoraphobia. The mean age was 38.16 years and ranged from 22 to 63 years old, with 37 females and eight males. Participants underwent six 90 minute sessions of treatment over four weeks, with the first session being an information gathering session. The results of the study indicated that there were no significant changes on the cognitive measures and in the frequency of panic attacks in the EMDR group, even though improvements were reported in interview measures and self-reporting. According to Goldstein (as cited in Shapiro, 2001, p. 363), people with agoraphobia may be less able to tolerate intense affect as a result of avoidance and have fear networks that are more highly diffused, which may account for the difficulties in the intense emotional work required in EMDR. The strengths of this study included the use of inclusion and exclusion criteria, and randomised control. Limitations included insufficient sessions to develop affect regulation and insufficient treatment sessions.

Fernandez and Faretta (2007) reported a case study of the treatment of a woman with EMDR who had panic disorder with agoraphobia for twelve years. In this case, six sessions of preparation were provided before the eye movements and 15 sessions of eye movements (according to the full EMDR protocol) were provided. At the one year follow-up, the woman reported no panic symptoms. This suggests that a long course of EMDR treatment together with a more substantial preparation phase may be more suited to the remittance of panic symptoms with agoraphobia.

3.3.3 The effect of EMDR treatment on phobias

Foley and Spates (1995) studied the efficacy of EMDR treatment for public speaking anxiety with 40 college students who had experienced a distressing public speaking event previously. The participants were assigned to the EMDR group or an assessment-only group, and underwent one to two sessions of EMDR. While the results on the two self-reported

measures demonstrated some improvements, no improvements were reported on heart rate measures. Their conclusion was that EMDR had limited effectiveness.

Muris and his colleagues studied the efficacy of EMDR for spider phobia (Muris & Merckelbach, 1997; Muris, Merckelbach, van Haften, & Mayer, 1997; Muris, Merckelbach, Holdrinet, & Sijsenaar, 1998). Child participants were offered a 60-minute to 150-minute session of EMDR or the control treatment, depending on the study. The results of their studies indicated that there was no significant difference in the effects of one session of EMDR compared to one session of imaginal flooding. However, in vivo exposure proved more effective than EMDR treatment on the behaviour avoidance test and the self-reported measures. Limitations included insufficient treatment, no treatment fidelity, and small sample size.

De Jongh and his colleagues have completed a number of research studies using EMDR to treat dental phobias (De Jongh, ten Broeke, & Renssen, 1999; De Jongh, van den Oord, & ten Broeke, 2002; De Jongh, Aartman, & Brand, 2003; De Jongh & ten Broeke, 2007). To date their research has not produced strong empirical evidence for the use of EMDR in reducing dental phobia. However, they conclude that EMDR treatment may be more effective in reducing the disturbance of a phobia if it is preceded by a traumatic event, for instance a dental phobia that begins after a horrendous dental experience, compared to a phobia with no known onset, such as a fear of snakes (De Jongh & ten Broeke, 2007).

The overview of the research into the variety of anxiety disorders revealed that while there may significant improvements in the secondary measures in generalised anxiety as reported on the STAI in some post traumatic stress studies, there was no strong empirical evidence for the treatment of phobia and panic disorders with agoraphobia using EMDR. De Jongh and ten Broeke (2007) claim that EMDR may be effective in phobias in which there are previous traumatic events.

3.3.4 Summary of anxiety research

To date no randomised control studies have been conducted to establish the effectiveness of EMDR on anxiety, therefore EMDR is not recognised by NICE UK as an effective treatment for anxiety disorders. Seven of the 12 randomised control studies into the effects of EMDR on post traumatic stress, evaluated the effects of EMDR on symptoms of anxiety as a secondary measure. Two of the seven studies reported a significant reduction in anxiety as measured by the state-anxiety and trait-anxiety subscale on the STAI (Marcus et al., 1997, 2004; Rothbaum et al., 2005). One study used the state-anxiety subscale on the STAI and reported a significant reduction in symptoms of anxiety with EMDR (Scheck et al., 1998). Two of the seven studies reported no significant decrease in symptoms of anxiety as measured on the STAI (Rothbaum, 1997), while another study reported that TTP was more effective than EMDR in reducing anxiety and gains dissipated by follow-up (Devilley & Spence, 1999; Carlson et al., 1998). One of the seven studies reported an improvement in generalised anxiety with EMD as measured on ADIS-R (Vaughan et al., 1994).

There were two other studies that examined the effects of EMDR on anxiety as secondary measures on the STAI (Edmond et al, 1999; Sprang, 2001). Both reported a significant improvement in symptoms of anxiety with EMDR treatment and that the gains were maintained at follow-up (Edmond et al, 1999; Sprang, 2001).

Two randomised control studies investigated the effects of six sessions of EMDR on panic disorder with agoraphobia (Feske & Goldstein, 1997; Goldstein, de Beurs, Chambless & Wilson, 2000). One reported there were no significant changes in cognitive measures and frequency of panic attacks, even though some improvements were reported (Goldstein, de Beurs, Chambless & Wilson, 2000). The other study reported there was a significant reduction in symptoms posttreatment, however these gains dissipated at 3-month follow-up (Feske & Goldstein, 1997). Another study investigated the effects of EMDR on panic

disorder with agoraphobia, but the person underwent six preparation sessions and 15 eye movement sessions (Fernandez & Farrata, 2007). At the one year follow-up, the person reported no panic symptoms suggesting that a longer course of EMDR treatment with a substantial preparation phase may be needed for the remittance of panic symptoms (Fernandez & Farrata, 2007).

There have been a number of studies that have investigated the effects of EMDR on phobias, in particular public speaking anxiety (Foley & Spates, 1995), spider phobias (Muris & Merckelbach, 1997; Muris, Merckelbach, van Haften, & Mayer, 1997; Muris, Merckelbach, Holdrinet, & Sijsenaar, 1998), and dental phobia (De Jongh, ten Broeke, & Renssen, 1999; De Jongh, van den Oord, & ten Broeke, 2002; De Jongh, Aartman, & Brand, 2003; De Jongh & ten Broeke, 2007). Participants who underwent one to two sessions of EMDR for public speaking anxiety reported no significant reduction in anxiety, suggesting that EMDR had limited effectiveness in reducing the anxiety associated with public speaking (Foley & Spates, 1995). With regard to the research on spider phobia, in vivo exposure proved more effective than EMDR (Muris & Merckelbach, 1997; Muris, Merckelbach, van Haften, & Mayer, 1997; Muris, Merckelbach, Holdrinet, & Sijsenaar, 1998). De Jongh & ten Broeke (2007) suggested that EMDR is more effective in reducing dental phobia if there was a previous traumatic dental experience compared to a phobia with no known onset, such as a snake phobia.

Maxfield (2007) suggests that future research is needed into the possible nature of preparation required to support the EMDR treatment of anxiety disorders. The present study was designed to measure the effect of EMDR treatment on anxiety as measured by the Millon Clinical Multiaxial Inventory-III (MCMI-III). However, the MCMI-III does not provide a measure for panic disorder and anxiety induced by phobias, so these forms of anxiety will not be investigated in this present research study.

3.4 The effect of EMDR treatment on personality disorders

In her adaptive information processing model, Shapiro (2007) postulates that a comprehensive psychological reorganisation may occur as a result of the effective processing of critical early life events using EMDR. This comprehensive reorganisation may be reflected by changes in ‘personality characteristics’ (Shapiro, 2007, p. 5). However, to date there have been no randomised control studies that have examined the effect of EMDR on personality changes to establish whether there are any long term changes.

In their qualitative analysis of the changes that occur with EMDR treatment in victims of childhood sexual abuse, Edmond, Sloan and McCarty (2004, p. 266) reported that the EMDR group experienced changes ‘on a deeper, more profound level’, compared to the eclectic therapy group. One participant explained that ‘EMDR allows you to go straight to the core, resolve the issue, and let the changes reverberate from the inside out’ (Edmond, Sloan & McCarty, 2004, p. 267). Another participant reported that EMDR ‘goes right to the cellular level for me, so for me I would like to say it goes deeper than talking about it’ (Edmond, Sloan & McCarty, 2004, p. 267). Not only did the EMDR participants report that they no longer felt disturbed by the feelings of the abuse, but they reported a transformation in their self-perception and their perceptions of others.

Brown and Shapiro (2006) documented a case study of a woman with borderline personality disorder who underwent EMDR treatment. The woman presented with a complex history with a variety of trauma. Before beginning the EMDR treatment, the woman underwent a comprehensive preparation phase, which included relaxation and resources skills to ensure proper stabilisation before the commencement of EMDR. After 20 sessions of EMDR, the results of the standardised measures revealed a clinically significant change in affect control, personal management, identity disturbance and interpersonal relating, and the woman saw herself as more competent, less dependent and more aware of her strengths,

weaknesses and needs. Whilst the findings in this study may not be generalised to others with borderline personality disorder, it does offer a possibility that EMDR may be effective in a comprehensive reorganisation in these personalities. Further research would need to take into consideration that symptoms range from high functioning to extremely debilitating in personality disorders and sufficient sessions are needed in these complex cases.

3.4.1 Summary of personality research

There have been very few studies which have evaluated the effects of EMDR treatment on personality patterns. Brown & Shapiro (2006) reported a case study of a person with borderline personality disorder who experienced a clinically significant change in affect control, personal management, identity disturbance and interpersonal relating after twenty sessions of EMDR treatment. Edmond et al. (2004) reported that participants experienced a change on a deeper more profound level and goes straight to the core of the difficulty. These findings suggest that EMDR may be effective in a comprehensive reorganisation in personality, as postulated by Shapiro (2007).

Due to the dearth of research into the effects of EMDR treatment on personality patterns, this research was designed to measure as many changes in personality patterns as possible. The MCMI-III was specifically chosen as an assessment tool for this research study because of its ability to provide measures of both clinical personality patterns [schizoid, avoidant, depressive, dependent, histrionic, narcissistic, antisocial, sadistic (aggressive), compulsive, negativistic (passive-aggressive), and masochistic (self-defeating)] and severe personality patterns [schizotypal, borderline and paranoid]. In the present study, the effects of EMDR treatment on personality patterns were measured before EMDR treatment, after the treatment of one trauma and at the follow-up measurement at the end of the research study to see if the changes in personality patterns were maintained.

3.5 The effect of EMDR treatment on dissociation

To date there have been no randomised control studies that have investigated the efficacy of EMDR treatment in reducing dissociation. Rather, the measures of change in dissociation have mostly been secondary measures in EMDR studies, in particular studies in post traumatic stress. A possible reason for the lack of studies on the efficacy of EMDR treatment with dissociation is the fact that a dissociative disorder may be part of the exclusion criteria in an EMDR study (Marcus et al., 1997). A score of 30 or greater on the Dissociative Experience Scale-II (DES-II) is often used as a possible indicator of dissociative disorder, and may be used as a cut-off point for using EMDR (Rothbaum, 1997; Richman, 2003). The Dissociative Experience Scale-II (Bernstein & Putnam, 1986; Carlson & Putnam, 1993, 2000) is a 28-item self-report scale that is used to quantify the nature, intensity and frequency of a number of dissociative experiences including, dissociation, derealisation, depersonalisation, absorption and amnesia. The DES-II requires participants to circle the percentage of time they experience an item. The DES-II was designed to be used in both clinical and non clinical populations and is reported to have satisfactory internal consistency with coefficient alpha value for college students ranging from .92 to .94 (Gibbs & Rude, 2004; Zingrone & Alvarado, 2001). In other EMDR studies, the dissociative symptoms were measured by the three dissociation items on the Clinical Administered PTSD subscale (CAPS) (Taylor et al., 2003). The CAPS is seen to have an excellent interrater reliability, with reliability coefficients for frequency and intensity scores for three clusters of post traumatic stress symptoms ranging from .92 to .99 (Blake, Weathers, Nagy, Kaloupek, Klauminzer, Charney, & Keane, 1990). Internal consistency was also high for these clusters, with alpha coefficients ranging from .73 to .85 (Blake et al., 1990).

In a randomised control study, Rothbaum (1997) compared EMDR with a waiting list control group. The dissociative tendencies were secondary measures in the study and the

DES-II was used as a measure. The results of the measure of dissociation indicate that the differences between the EMDR and the control group were not statistically significant.

In their randomised control study, Taylor et al. (2003) assigned 60 participants to three different conditions, namely eight 90-minute sessions of EMDR (n = 19), relaxation training (n = 19) and exposure therapy consisting of in vivo and imaginal exposure (n = 22). Whilst all were diagnosed with PTSD according to the DMS-IV, the dissociation was measured using the subscale of the CAPS assessment. The results of the study indicated that the dissociative symptoms improved significantly for the exposure group and the relaxation group. While the EMDR group did not achieve the same improvements in their dissociative symptoms, the trend was in a similar direction to the exposure and relaxation groups.

Rothbaum et al. (2005) compared 75 female rape victims randomly assigned to nine 90-minute sessions of EMDR, prolonged exposure therapy or a no-treatment waiting list control group. Dissociative symptoms were secondary measures in this study. The results of the DES-II revealed there was a significant decrease in dissociation from pretreatment to posttreatment in the EMDR and the exposure group when compared to the waiting list controls. However, the scores were more significant in the EMDR group. At the six-month follow-up, the scores for the dissociation were only marginally different for both treatment groups.

3.5.1 Summary of dissociation research

To date there have been no randomised control studies that have investigated the effects of EMDR on dissociation, therefore NICE UK has not recognised EMDR as an effective treatment for dissociation. However, in the 12 randomised control studies into the effects of EMDR on post traumatic stress, three studies evaluated the effects of EMDR on dissociation as a secondary measure (Rothbaum, 1997; Taylor et al., 2003; Rothbaum et al.,

2005). Two of these three studies reported a significant reduction in dissociation (Taylor et al., 2003; Rothbaum et al., 2005), while the third study reported there was no significant difference in reduction between treatment and a waiting list control group (Rothbaum, 1997).

The research on dissociation in the abovementioned EMDR studies has influenced the design of this research study. This research study will also investigate the effect of EMDR treatment on dissociation by using the DES-II as a measuring tool. This study will also use the cut off score of 30 on the DES-II, so that people with a score of over 30 would be excluded from the study.

3.6 The effect of the number of EMDR treatment sessions

One of the criticisms levelled at the current EMDR research studies, is that a number of them offered insufficient EMDR treatment sessions (Boudewyns et al., 1993; Jensen, 1994; Vaughan et al., 1994; Pitman et al., 1996; Wilson et al., 1996; Devilly et al., 1998; Scheck et al., 1998).

There have been a few research studies that have offered sufficient EMDR sessions to reduce the subjective unit of disturbance to zero (Sprang, 2001). Sprang (2001) compared the effects of EMDR treatment (n=23) to guided mourning treatment (N=27). The number of sessions for each participant varied. Participants undergoing EMDR used an average of 6.19 sessions, compared to guided mourning requiring 10.68 sessions.

Marcus et al. (1997) compared the effects of EMDR treatment (n=34) to Standard Kaiser Care (N=33). The number of treatment sessions for each participant varied. Participants undergoing EMDR used an average of 7.71 sessions, compared to Standard Kaiser Care requiring 11.25 sessions.

This research study was designed to place no limit on the number of sessions needed to reduce the subjective unit of disturbance to zero. The design of this research study therefore provides sufficient EMDR treatment sessions, which is a strength of the study.

3.7 Summary of current research

To date the majority of the research into the effects of EMDR therapy has focused on the treatment of post traumatic stress. Post traumatic stress is the only psychiatric condition for which EMDR is recognised by NICE UK as an effective treatment. Sixteen of the 21 studies reported clinically significant improvements in symptoms of post traumatic stress with EMDR treatment on clinical, physiological and self-reporting instruments (Renfrey & Spates, 1994; Vaughan et al., 1994; Wilson et al., 1995, 1997; Boudewyns & Hyer, 1996; Pitman et al., 1996; Wilson et al., 1996; Rothbaum, 1997; Marcus et al., 1997; Carlson et al., 1998; Devilly et al., 1998; Sprang, 2001; Ironson et al., 2002; Lee et al., 2002; Power et al., 2002; Rothbaum et al., 2005; van der Kolk et al., 2007). One of the studies reported no improvements in combat veterans with two sessions of EMDR (Jensen 1994), while three studies reported that EMDR was less effective than other psychological therapies (Scheck et al., 1998; Devilly & Spencer, 1999; Taylor et al. 2003). Eleven of these 21 studies reported that the gains were maintained at follow-up (Vaughan et al., 1994; Wilson et al., 1995, 1997; Rothbaum, 1997; Marcus et al., 1997; Carlson et al., 1998; Sprang, 2001; Ironson et al., 2002; Lee et al., 2002; Power et al., 2002; Rothbaum et al., 2005; van der Kolk et al., 2007). Two of the studies reported that gains were not maintained at follow-up (Pitman et al., 1996; Devilly et al., 1998).

The trends that emerged from the post traumatic stress studies indicate that EMDR is more effective than a waiting list control (Rothbaum, 1997; Carlson et al., 1998; Rothbaum et al., 2005), delayed treatment (Wilson et al., 1995, 1997), biofeedback with assisted relaxation

(Carlson et al., 1998); active listening (Scheck et al., 1998), standard Kaiser care (Marcus et al., 1997, 2004), prolonged exposure (Wilson et al., 1996; Ironson et al., 2002), guided mourning (Sprang, 2001), and stress inoculation with prolonged exposure (Lee et al., 2002), in reducing symptoms of post traumatic stress. However, the research also seems to indicate that EMDR treatment is not as effective as TTP (Devilley & Spencer, 1999), in vivo and imaginal exposure (Taylor et al., 2003) and prolonged exposure (Rothbaum et al., 2005).

The post traumatic stress research also indicates that EMDR with eye movement is more effective than a variety of other treatment conditions: fluoxetine and pill placebo (van der Kolk et al., 2007), EMDR with eyes closed (Boudewyns & Hyer, 1993), EMDR with eyes tracking light bar (Renfrey & Spates, 1994), EMDR with fixed eyes (Renfrey & Spates, 1994), and EMDR with hand taps (Wilson et al., 1996; Pitman et al. 1996). One study found that EMDR with eye movements was as effective as EMDR with eyes closed (Boudewyns & Hyer, 1993). In one study, EMDR with eye movement was seen as slightly less effective than EMDR with fixed eyes (Pitman et al. 1996). In another study, EMDR with eye movement seemed more effective than EMDR with fixed eyes; however the gains were not maintained for both conditions at follow-up (Devilley et al., 1998).

To date no randomised control studies have been conducted to establish the effectiveness of EMDR with depression, therefore EMDR is not recognised by NICE UK as an effective treatment for depression. There have been 13 studies that have evaluated the effectiveness of EMDR as a treatment for depression as a secondary measure in post traumatic stress studies. Ten of the 13 studies reported a significant reduction in depressive symptoms as measured by BDI with EMDR treatment (Marcus et al., 1997, 2004; Rothbaum, 1997; Scheck et al, 1998; Carlson et al, 1998; Devilly & Spence, 1999; Ironson et al., 2002; Lee et al., 2002; Taylor et al., 2003; Rothbaum et al., 2005; van der Kolk et al., 2007). One study reported a reduction in depressive symptoms but the results fell short of significance on

the BDI (Edmond et al., 1999). One study reported a significant reduction in depressive symptoms as measured by the Hospital Anxiety & Depression Scale (HADS) (Power et al., 2002) and another study reported an improvement in major depression as measured by the Hamilton Rating Scale for Depression (HRSD) (Vaughan et al., 1994). No studies into the effects of EMDR on depression reported no change in symptoms or an increase in symptoms.

To date no randomised control studies have been conducted to establish the effectiveness of EMDR with anxiety, therefore EMDR is not recognised by NICE UK as an effective treatment for anxiety disorders. There have been nine studies that have evaluated the effects of EMDR on symptoms of anxiety as a secondary measure in post traumatic stress studies. Four of these studies reported a significant reduction in anxiety as measured by the state-anxiety and trait-anxiety subscale on the STAI (Marcus et al., 1997, 2004; Edmond et al, 1999; Sprang, 2001; Rothbaum et al., 2005) and the gains were maintained at follow-up (Edmond et al, 1999; Sprang, 2001; Rothbaum et al., 2005). One study used the state-anxiety subscale on the STAI and reported a significant reduction in symptoms of anxiety with EMDR (Scheck et al., 1998). Two studies reported no significant decrease in symptoms of anxiety as measured on the STAI (Rothbaum, 1997), while another study reported that TTP was more effective than EMDR in reducing anxiety and the EMDR gains dissipated by follow-up (Devilley & Spence, 1999; Carlson et al., 1998). One study reported an improvement in anxiety with EMD as measured on ADIS-R (Vaughan et al., 1994).

Two randomised control studies investigated the effects of EMDR on panic disorder with agoraphobia (Feske & Goldstein, 1997; Goldstein, de Beurs, Chambless & Wilson, 2000). One study reported some improvements in cognitive measures and frequency of panic attacks with EMDR (Goldstein, de Beurs, Chambless & Wilson, 2000). Another study reported a significant reduction in anxiety symptoms post EMDR treatment, however these gains dissipated at follow-up (Feske & Goldstein, 1997). Another study investigated the

effects of EMDR on panic disorder with agoraphobia, but used six preparation sessions and 15 eye movement sessions (Fernandez & Farrata, 2007). At the one year follow-up, the person reported no panic symptoms suggesting that a longer course of EMDR treatment with a preparation phase may be needed for the remittance of panic symptoms (Fernandez & Farrata, 2007).

With regard to the effectiveness of EMDR with phobias, participants who underwent one to two sessions of EMDR for public speaking anxiety reported no significant reduction in public speaking anxiety (Foley & Spates, 1995). With regard to the research on spider phobia, in vivo exposure proved more effective than EMDR in reducing the fear of spiders (Muris & Merckelbach, 1997; Muris, Merckelbach, van Haften, & Mayer, 1997; Muris, Merckelbach, Holdrinet, & Sijsenaar, 1998). In the studies on the effectiveness of EMDR with dental phobias (De Jongh, ten Broeke, & Renssen, 1999; De Jongh, van den Oord, & ten Broeke, 2002; De Jongh, Aartman, & Brand, 2003; De Jongh & ten Broeke, 2007), the results tend to suggest that EMDR is more effective in reducing dental phobia if there was a previous traumatic dental experience compared to a phobia with no known onset, such as a snake phobia (De Jongh & ten Broeke, 2007).

To date there have been no randomised control studies that have investigated the effects of EMDR on personality pattern, therefore NICE UK has not recognised EMDR as an effective treatment of personality disorders. Brown & Shapiro (2006) reported a case study of a person with borderline personality disorder who experienced a clinically significant change in affect control, personal management, identity disturbance and interpersonal relating after twenty sessions of EMDR. Edmond et al. (2004) reported that participants experienced a change on a deeper more profound level and goes straight to the core of the difficulty. These findings suggest that EMDR may be effective in a comprehensive reorganisation in personality, as postulated by Shapiro (2007).

To date there have been no randomised control studies that have investigated the effects of EMDR on dissociation, therefore NICE UK has not recognised EMDR as an effective treatment for dissociation. However, in the 12 randomised control studies into the effects of EMDR on post traumatic stress, three studies evaluated the effects of EMDR on dissociation as a secondary measure (Rothbaum, 1997; Taylor et al., 2003; Rothbaum et al., 2005). Two of these three studies reported a significant reduction in dissociation (Taylor et al., 2003; Rothbaum et al, 2005), while the third study reported there was no significant difference in reduction between treatment and a waiting list control group (Rothbaum, 1997).

The research to date on the effectiveness of EMDR treatment has influenced the design of this EMDR research study. To date there have been no systematic studies on the effects of EMDR on personality patterns, so this study will investigate the effect of EMDR treatment on both clinical personality patterns [schizoid, avoidant, depressive, dependent, histrionic, narcissistic, antisocial, sadistic (aggressive), compulsive, negativistic (passive-aggressive), and masochistic (self-defeating)] and severe personality patterns [schizotypal, borderline and paranoid], as measured by the MCMI-III. This present research will also investigate whether EMDR treatment has a significant effect on the symptoms of the depressive constructs, major depression, dysthymia and depressive personality disorder, on the MCMI-III. This research will also investigate the effect of EMDR on other clinical syndromes [post traumatic stress and anxiety], and severe clinical syndromes, [bipolar, thought disorder, delusional disorder, and alcohol and drug dependence] on the MCMI-III. Other studies have also evaluated the effects of EMDR on dissociation, and this study will also evaluate the pattern of change in dissociation on the DES-II with EMDR treatment.

Chapter 4: Research design

4.1 Motivation for this study

EMDR has become one of the most well researched psychological therapies for post traumatic stress and it is well established that EMDR treatment is as effective as cognitive behavioural therapy (CBT) in the reduction of symptoms of post traumatic stress. However, there are many questions yet to be answered about the pattern of reduction of distress in clinical personality patterns, severe personality patterns, depressive constructs, other clinical syndromes, severe clinical syndromes and dissociation when using EMDR treatment.

While Shapiro (2007) states that personality structures may undergo enduring changes as a result of EMDR treatment, to date there have been no systematic studies into the effect of EMDR on personality patterns. This study therefore evaluated the effect of EMDR treatment on clinical personality patterns [schizoid, avoidant, depressive, dependent, histrionic, narcissistic, antisocial, sadistic (aggressive), compulsive, negativistic (passive-aggressive), and masochistic (self-defeating)] and severe personality patterns [borderline, schizotypal, and paranoid] on the MCMI-III.

In addition, as most of the EMDR research to date focused on the effectiveness of EMDR treatment with post traumatic stress, this study evaluated the effect of EMDR treatment on depressive constructs [major depression, dysthymia, and depressive personality], other clinical syndromes [anxiety and post traumatic stress] and severe clinical syndromes [bipolar, thought disorder, delusional disorder, and alcohol and drug dependence] as measured by the MCMI-III, and dissociation as measured by the DES-II.

4.2 Research aim

One of the aims of this study was to investigate the effects of EMDR treatment on clinical personality patterns [schizoid, avoidant, depressive, dependent, histrionic, narcissistic,

antisocial, sadistic (aggressive), compulsive, negativistic (passive-aggressive), and masochistic (self-defeating)] and severe personality patterns [borderline, schizotypal, and paranoid], as measured on the MCMI-III. The aim was to establish whether there was any change in personality patterns with EMDR treatment.

Another aim was to investigate the effects of EMDR treatment on depressive constructs [major depression, dysthymia and depressive personality], other clinical syndromes [post traumatic stress and anxiety], and severe clinical syndromes [bipolar, thought disorder, delusional disorder, and alcohol and drug dependence], as measured on the MCMI-III. The aim was to establish whether there was any change in these clinical syndromes with EMDR treatment.

Another aim of this study was to investigate the effects of EMDR on dissociation as measured by the DES-II. The aim was to establish whether there was any change in dissociation with EMDR treatment.

This research study also investigated whether any significant EMDR treatment effects were maintained at follow-up.

4.3 Research questions

1. Does EMDR treatment lead to significant changes in:
 - a. MCMI-III scores¹ for:
 - i. Personality patterns (schizoid, avoidant, depressive, dependent, narcissistic, sadistic, compulsive, histrionic, negativistic, and masochistic);
 - ii. Severe personality patterns (borderline, schizotypal, and paranoid);
 - iii. Depressive constructs (major depression, dysthymia, and depressive personality);

¹ Treatment effects were assessed at two points: (a) between the first measurement before EMDR treatment and the measurement after the treatment of one trauma, and (b) between the first measurement before EMDR treatment and the last measurement at the end of EMDR treatment, or after the treatment of multiple traumas.

- iv. Other clinical syndromes (anxiety and post traumatic stress)
 - v. Severe clinical syndromes (bipolar, thought disorders, delusional disorder, and alcohol and drug dependence).
- b. Does EMDR treatment lead to significant changes in DES-II¹ scores for dissociation?
2. Are observed treatment effects (1a- 1b above) maintained at follow-up?²

4.4 Null hypotheses

1. EMDR treatment does not lead to significant changes in:
- a. MCMI-III scores for:
 - i. Personality patterns (schizoid, avoidant, dependent, narcissistic, sadistic, compulsive, histrionic, negativistic, and masochistic);
 - ii. Severe personality patterns (borderline, schizotypal, and paranoid);
 - iii. Depressive constructs (major depression, dysthymia, and depressive personality);
 - iv. Other clinical syndromes (anxiety and post traumatic stress);
 - v. Severe clinical syndromes (bipolar, thought disorders, delusional disorder, and alcohol and drug dependence).
 - b. EMDR treatment does not lead to significant changes in DES-II scores for dissociation.
2. Significant EMDR treatment effects (1a - 1b above) are not maintained at follow-up.

² Follow-up effects were assessed at two points: (a) between the first measurement before EMDR treatment and the follow-up measure at the end of the study, and (b) between the last measurement at the end of EMDR treatment and the follow-up measurement at the end of the research study.

4.5 Methodology

4.5.1 Sponsor and ethical approval

Before the research study could begin, both a sponsor and ethical approval had to be obtained in the United Kingdom (UK). The National Health Service (NHS) Primary Care Trust in South Gloucestershire kindly offered to sponsor this research study, and provided accommodation, processes to obtain participants, and administrative and clinical support. As a result, the South Gloucestershire NHS formed the Post Traumatic Stress Clinic specifically for this research study. The accommodation for the Clinic was made available in two physical locations, namely at Patchway Clinic, Patchway, Bristol, England, and at Christchurch Church Family Medical Centre, Downend, South Gloucestershire, England.

Before the research study could begin, ethical approval had to be obtained from the National Research Ethics Service in the UK. A design of this research study was submitted to the Southmead Research Ethics Committee, UK and they suggested a few amendments, mainly to simplify the communication to the participants (See Appendix 1.1 for documentation approved by the Ethics Committee). After the amendments were approved, a favourable ethical opinion was obtained on 26 April 2005. The Research Ethical Committee reference for this study was 05/Q2002/13.

An application for research funds was made to the South Gloucestershire NHS, to increase resources for the research project. However, the application for funds was denied. So this research study was limited to what resources were available. All the psychological assessments and the full protocol EMDR treatment with unlimited sessions were undertaken by the researcher for no payment. The NHS provided the researcher with an assistant psychologist to assist with the administration, the management of waiting lists, the administration and scoring of the psychological assessments, and the auditing of the data. All

the work completed by the assistant psychologist was done as part of a volunteer contract with no payment either.

4.5.2 Sample

A power analysis was conducted on the basis of assessing five clinical syndromes. If the results yielded a large effect, forty-five participants would be needed for 0.80 and fifty-five participants for 0.90. If the results yielded a medium effect, ninety participants would be needed for 0.80 and one hundred and forty participants would be needed for 0.90. On the basis of these results it was decided to use no less than thirty participants and no more than eighty participants for this study. The low estimation of thirty participants was seen as what could be reasonably accomplished with the available resources, even though this would reduce the statistical effect.

In the present study, 32 participants completed the full EMDR treatment and assessment. Twenty were female and twelve were male. The youngest was 23 years old and the oldest was 65 years old. The mean age for this sample was 42.78 years old.

Participants were obtained through the general practitioners (GPs) in the South Gloucestershire NHS. All the 158 GPs received a letter outlining the research study that invited them to refer people within a certain criteria for EMDR treatment (See Appendix 1.2). The GPs were not made aware of the research hypotheses and were unable to deduce the hypotheses from the invitation letter.

A probability sample was not used for this research project, as the participants were not randomly selected. Therefore the results of this study may not be representative of a clinical population and the results may not be highly generalisable (Sarantakos, 1998).

4.5.3 Criteria

4.5.3.1 Inclusion criteria

In order to participate in the research study, participants had to fulfil the following criteria:

- Be referred by a GP in South Gloucestershire NHS Primary Care Trust (PCT).
- Be over 18 years of age.
- Have at least one diagnosis of clinically significant major depression, dysthymia, post traumatic stress and/or anxiety. This diagnosis was based on a score of 75 or more on the Millon Clinical Multiaxial Inventory-III (MCMI-III) (Millon, 1997).

A person could have more than one of these diagnoses to participate.

- Be able to do the safe place exercise.

4.5.3.2 Exclusion criteria

People could not participate in this research study if they fulfilled the following criteria:

- Under the age of 18 years old.
- A clinically significant diagnosis of severe personality pathology on the MCMI-III. This would exclude anyone with a score of 75 or more on the schizotypal, borderline and paranoid personality scale on the MCMI-III.
- A clinically significant diagnosis of two of the severe clinical syndromes on the MCMI-III. This would exclude anyone with a score of 75 or more on the thought disorder and delusional disorder scale on the MCMI-III.
- A clinically significant diagnosis of bipolar (manic) disorder on the MCMI-III. This would exclude anyone with a score of 75 or more on the bipolar (manic) scale on the MCMI-III.

- A clinically significant diagnosis of alcohol or drug dependence on the MCMI-III. This would exclude anyone with a score of 75 or more on the alcohol dependence and drug dependence scale on the MCMI-III.
- A score of 30 or more on the Dissociative Experiences Scale II (DES-II) (Carlson & Putnam, 1993, 2000).
- Had ongoing self-mutilation or suicidal or homicidal intent.
- Were taking benzodiazepines or amitriptyline.
- Needed concurrent adjustment of their psychotropic medication.
- Undergoing other psychological treatment.
- Had severe medical conditions such as heart conditions, uncontrolled epilepsy, severe physical frailty or were terminally ill.
- Were heavily pregnant, but could join the study after the birth of the baby.
- Were involved in an ongoing abusive relationship.
- Were unable to do the safe place exercise.
- Any eye dysfunction, such as retinal detachment.

4.5.3.3 Reasons for exclusions

People with clinically significant (>75 on MCMI-III) severe personality disorders [schizotypal, borderline and paranoid personality pattern] and severe clinical syndromes [delusional disorders and thought disorders] were excluded from this study because of the lack of resources available to this research project. It was predicted that people with these severe conditions would need considerable preparation, which the study was unable to provide. However, people with a score of one standard deviation above the mean (a score of 60-74 on MCMI-III) on these severe personality and severe clinical syndrome scales were invited to participate in this study.

People with alcohol dependence (or a score of more than >75 on the MCMI-III) were excluded from this study because at times people may use alcohol to dampen the disturbance of memories they are experiencing. The EMDR treatment stimulates disturbing memories and people may feel considerably hyper aroused and disturbed during the reprocessing. It would be counter productive if the person started drinking more to damp the disturbance EMDR treatment was stimulating. If the drinking was brought under control and the person developed another ways of soothing him or herself, then the person could return to the study.

People abusing substances may not be able to process disturbing memories efficiently and were therefore excluded from the study. For instance, crack cocaine addicts have difficulty tracking fast moving fingers, which may be due to increased glucose metabolism in the orbital-frontal cortex (Volkow, Fowley, Wolf, Hitzemann, Dewey, Bendriem, Albert, & Hoff, 1991).

In addition, people were excluded from the study if they were taking benzodiazepines and amitriptyline, due the sedative properties of these medications (Richman, 2004).

People who obtained a score of 30 or higher on the Dissociative Experience Scale II (DES-II) were not suitable for this study because of the severe dissociative component and the potential of EMDR treatment to rapidly destabilise the participant (Carlson, Putnam, Ross, Torem, Coons, Dill, Loewenstein & Braun, 1993). The study unfortunately did not have sufficient resources necessary for a lengthy preparation phase and support that would be needed in complex dissociative disorders. If a person obtained a score of 20 or more on a particular question, the researcher would explore it with the person to assess whether the person has understood the question correctly. For instance, a man may say he found new clothing in his wardrobe but this is because his wife buys his clothes. This is clearly not a dissociative experience and illustrates that the people may misunderstand questions (Bernstein & Putnam, 1986).

People with ongoing self mutilation and suicidal or homicidal intent were also excluded from this study because of the potential of rapidly destabilising the participant, and the risk of increasing mutilation, or of the person carrying out the intent.

People with severe medical problems, such as heart conditions, severe asthma, uncontrolled epilepsy, were excluded from the study due to the risk of aggravating their physical conditions with the intense hyper arousal that can be present in the EMDR reprocessing.

People unable to do the safe place exercise are generally unable to soothe themselves and were also excluded from the study. Should they have learned these skills in other services, they would then have been able to access the study again at a future date.

4.5.4 Fidelity check

In order to ensure fidelity to the EMDR treatment, the researcher had to fulfil two criteria, namely to be trained by an accredited EMDR trainer and adhere to the EMDR treatment protocol.

The researcher underwent the full accredited EMDR training with Alexander Richman EMDR Training in London, England, UK. Alexander Richman is an accredited EMDR trainer with the EMDR Institute, USA. The researcher completed EMDR training, namely Level 1, Intermediate and Level 2. The researcher gained accreditation as a Europe Approved EMDR practitioner early in the research study and a year later gained accreditation as a Europe Approved EMDR Consultant.

The researcher's adherence to the EMDR protocol was assessed by an accredited Europe Approved EMDR consultant, Dr John Campbell-Beattie in England. One session of an EMDR assessment and visual bilateral stimulation was taped at the beginning of the research study and forwarded to the EMDR Consultant to assess the adherence to the EMDR

protocol. The fidelity was accomplished by means of his own opinion. According to Maxfield and Hyer (2002) Revised Gold Standard Scale, this fidelity check would only be considered less than optimal. For a high fidelity check, each session should have been video taped and assessed by an independent assessor according the fidelity check set out by Francine Shapiro. Unfortunately the research study did not have sufficient resources to undertake a rigorous fidelity check.

4.5.5 Procedure

4.5.5.1 Recruitment of participants

Potential participants were identified by the GPs in the NHS South Gloucestershire PCT and referred to the EMDR research study by means of a referral letter which outlined the contact details of the person and a brief description of their disturbing memories and symptoms. The person was then sent a letter from the NHS Post Traumatic Stress Clinic with a date of an initial consultation, which provided an opportunity to meet the researcher and gain information about the study.

If the person did not respond to the invitation of an initial consultation, then the person was referred back to their GP.

4.5.5.2 Initial Consultation

Each participant was provided with an initial consultation of up to 90 minutes. The purpose of the initial consultation was to explain the research study to the person, obtain a brief history and begin to establish suitability. The consultation provided an opportunity to explain the research study and provide information on the assessment and the EMDR treatment process. The explanation took into consideration the background, age, experience and sophistication of the person.

It was important that people had sufficient information to be able to provide informed consent. The person was given a 'Participant Information Sheet' (see Appendix 1.1.2) together with a 'Flow Chart outlining the Treatment Process' (see Appendix 1.1.2) and a 'Consent Form' (see Appendix 1.1.3) to take home with them to assess whether they would like to participate in the study or not. Signing the consent form meant that they consented to undergo a number of psychological measurements and EMDR treatment according to the full protocol. If they wanted to participate, then they were to bring the signed consent form to their next session.

During the initial consultation, people were asked for a brief history of disturbing events and for information about their social and relational history to establish how much support they had. They were asked specifically whether they were experiencing any suicidal or homicidal intent, any ongoing self-mutilation, alcohol and drug dependence, medical conditions, any eye problems, or currently in an ongoing abusive relationship. The purpose was to identify any exclusion criteria. If there was any suicidal or homicidal intent, or ongoing mutilation, then the person was referred to the NHS Avon and Wiltshire Secondary Care Service. If a person declared an alcohol or drug dependence, then the person was referred to the South Gloucestershire Drug and Alcohol Service. If the person had any serious medical conditions or eye problems, then he or she was referred back to their GP. If a person was in an ongoing abusive relationship, then the person was referred to the Domestic Violence Support Unit. The aim was to direct people to services that were suited to their difficulty, so that they could access the appropriate treatment or support, which constituted ethical care of the person.

4.5.5.3 Session two

If the person decided to participate in the research study, then they returned their consent form and underwent the psychometric component of the psychological assessment. This involved completing the Millon Clinical Multiaxial Inventory-III (MCMI-III) (Millon, 1997) and the Dissociative Experience Scale II (DES-II) (Bernstein & Putnam, 1986; Carlson & Putnam, 2000). The MCMI-III and DES-II are self-reporting instruments.

The research study unfortunately did not have access to a blind independent assessor due to lack of resources. The participant was provided with a separate room and left on their own to complete the self-reporting questionnaires. The researcher or the assistant psychologist gave the person the questionnaires and went through the instructions on how to complete them. No time limit was provided for the person to complete the questionnaires. If the person needed further instructions of how to complete the questionnaires, then the assistant psychologist was on hand to assist them. After the questionnaires were completed, they were scored mainly by the assistant psychologist and audited by the researcher. However, if they were scored by the researcher, then they were audited by the assistant psychologist. All the questionnaires were scored and checked separately by the researcher and the assistant psychologist.

While the assistant psychologist was blind to the research hypotheses, she was not blind to the type of treatment used in the study and become familiar with the treatment outcomes.

The results of the MCMI-III and DES-II provided both a before treatment measure and assisted in establishing suitability. Any person with a score of 75 or more on the schizotypal personality scale, borderline personality scale, paranoid personality scale, thought disorder scale, delusion disorder scale, and bipolar (manic) scale, on the MCMI-III was excluded from the study and referred to the NHS Avon and Wiltshire Secondary Care

Service. Any person with a score of 75 or more on the alcohol dependence and drug dependence scale was excluded from the study and referred to the South Gloucester Drug and Alcohol Service. Any person with a score of 30 or more on the Dissociative Experiences Scale II (DES-II) was excluded from the study and referred to the NHS Avon and Wiltshire Secondary Care Service. Any person with no clinically significant diagnosis in major depression, dysthymia, post traumatic stress, or anxiety disorders, or a score of less than 75 on all these scales, were unable to participate in the study, and were referred to the NHS South Gloucestershire Primary Care Trust Counselling Service if they wished to undergo counselling.

Any person with a score of 75 or more on the major depression, dysthymia, post traumatic stress and anxiety scale, and who did not fulfil any of the exclusion criteria continued in the assessment process.

4.5.5.4 Session three

On the third session people returned to receive the results of their MCMI-III and DES-II. If people did not meet the inclusion criteria on the MCMI-III and DES-II, then they were referred to other relevant services. If they fulfilled the inclusion criteria on the MCMI-III and DES-II, then a complete history was obtained which corresponded to phase one of the EMDR protocol. During this consultation a comprehensive overview of the disturbance the person experienced was obtained. EMDR is a three-pronged approach, which includes the past, the present and the future (Richman, 2004). The presenting problem is identified together with the symptoms, which include the behaviour, emotions and cognitions associated with the disturbance. Current triggers are located and the duration of the disturbance is established. The touchstone events or the aetiological memories are identified. For instance, when did the

disturbance first start, how long did it continue for and how does it affect the person now?

Also the goals or desired state of the person is also explored.

Once the history had been established, the traumas deemed significant to the participant were recorded on a chronological timeline from birth to the present age (Richman, 2004). This included both 'big T-traumas' or life threatening traumas, such as a road traffic accident, or 'small t-traumas' that were not life threatening but still perceived as disturbing, such as a divorce (Shapiro, 2001). Life threatening traumas could include those in which the participant was personally exposed to a life threatening event, or it could include those in which the participant witnessed an event that threatened the life of another person. Once all the traumas were delineated, then a subjective unit of disturbance (SUD) was obtained for each significant event that represented how much the memory still disturbed the person at the time of the research assessment, with a score of zero representing no disturbance and a score of ten representing the worst possible disturbance. This study planned to target the most disturbing traumas for reprocessing with EMDR. Before the EMDR treatment, a disturbing event may have a SUD score of between 7–10, which would represent considerable disturbance, and it was predicted that the disturbance would reduce to a SUD score of between 0–1 with EMDR treatment.

Those who still met the inclusion criteria at the end of the third session were invited to the fourth session, in which they learnt relaxation and stabilisation techniques.

4.5.5.5 Session four

During the fourth session, people were taught a number of stabilisation techniques, namely progressive muscle relaxation, breathing retraining and the safe place exercise. This is in line with the EMDR protocol, which states that EMDR treatment cannot begin until the person has the ability to soothe themselves (Shapiro, 2001). If a person has not got the ability

to soothe themselves, then a period of time would be dedicated to resource installation work that would help the person develop these resources (Shapiro, 2001). However, the design of this study did not incorporate resource installation due to lack of resources, so only people who were able to soothe themselves using the safe place exercise were able to participate.

Breathing training

The researcher explained to participants how they should breathe by using their diaphragm or what is referred to as diaphragmatic breathing (Fried, 1999). Participants were encouraged to relax their abdominal muscles and inhale through their nose. As their diaphragm contracted, their abdominal muscles expanded. The participant was encouraged to hold their breathe for a short while and then breathe out of their nose as slowly as possible, without getting to the point of feeling dizzy or faint. Breathing retraining helps the airways stay open longer during the exhalation, which allows more stale air out of the lungs. The researcher used the analogy of a burning fire, the more oxygen you feed the fire, the larger the fire will become. Likewise, the more oxygen inhaled the more the person may hyperventilate, and the more anxious and panicky the person may feel. The researcher would practice this technique three times with the participant.

Progressive muscle relaxation technique

A modified version of progressive muscle relaxation technique was taught to the participants (Bernstein, Borkovec, & Hazlett-Stevens, 2000). The researcher demonstrated the technique once to the participant and practiced it twice together with the participant. Progressive muscle relaxation technique involves both tensing and relaxing. First, the person would tense their hands, then add the tension of their arm muscles, followed consecutively by their neck and shoulder muscles, their face muscles, their stomach muscles, their bottom

muscle, their leg muscles, and then finally their feet muscles. When the whole body was tense, the participant would be encouraged to hold the tension for about 15 seconds and then relax each part of the body systematically, starting with their hands, then their arms, then their shoulders and neck, then their face muscles, then their stomach muscles, then their bottom, their legs, and finally their feet muscles. After this they were instructed to just let their body relax. This was followed by the safe place exercise.

Safe place exercise

The researcher changed the name of the safe place exercise to a 'nice' place exercise. This was because the word 'safe' could be an emotionally loaded word for some people, whereas the word 'nice' is more neutral. People unable to do the nice place exercise were excluded from the study because of the inability to soothe themselves.

The nice place exercise is based on a pleasant imagery exercise (Shapiro, 2001; Richman, 2004). The person would be asked to bring to mind an image of a nice place that creates feelings of calm, peace, pleasantness and well being. The participant was then asked to provide a cue word for the image, which could for instance be 'a beach in the Maldives'. The cue word would help the participant recall the pleasant image to induce a feeling of calmness. It is preferable that the person be alone in their nice place as there may be associations with other people who may disturb the feeling of calmness. Once the image had been identified, the researcher asked the participant to focus on the colours, the sounds, the textures, and the pleasant emotions and sensations induced by the image. The participant was then asked to feel these emotions and focus on the location of these pleasing sensations in the body. The researcher used soothing, supportive tones to enhance and establish the affect. If the participant was able to bring up an image of a nice place and feel relaxed and calm, then the person had the ability to self-regulate (Shapiro, 2001) and was subsequently offered the

opportunity to participate in the EMDR treatment research. However, if the person was unable to engage with the nice place, then the researcher would go through the exercise again with the participant to help install it. If the participant was unable to do the nice place exercise, then the participant was excluded from the research study because of the lack of internal resources to self soothe and referred to NHS Avon and Wiltshire Secondary Care Service for treatment that suited the person's condition.

Once the participants had learnt the three techniques, namely breathing retraining, progressive muscle relaxation and the nice place exercise, they were asked to practice these techniques at least once in the morning and once in the evening each day for the first week after the fourth session. The aim was to install these techniques so that they could use them when they needed to soothe themselves during the treatment.

By the end of session four, all the participants had been assessed and suitability to participate in the research study was established. All the participants who continued from this point on underwent the full EMDR protocol treatment and measurement outlined in the research design.

4.5.5.6 Session five

At the start of the fifth session, the researcher went over the three stabilisation techniques once again, namely breathing retraining, progressive muscle relaxation and nice place exercise, to ensure the participants understood them and provided an opportunity for them to ask any questions.

The researcher then explained the EMDR model of treatment again and set the expectations. The participants needed to understand that EMDR would access the disturbing memories quite quickly and that they could have experienced painful or strong emotion during the reprocessing. The emotions could have been so powerful that the participants may

have felt that they were back in the past. A variety of metaphors were introduced in the preparation phase in order to help them conceptualise the process. For instance, a metaphor could be that of sitting in a train and the traumatic memory is scenery on the outside of the train, and the train is moving through the memory. The participants were encouraged to bear in mind that the distressing memory was in the past and not currently happening, even though the participants may have felt as if they were re-experiencing it (Shapiro, 2001; Richman, 2004).

The participants were also debriefed so that they understood that the processing could continue after the eye movement sessions. They may have found that they experienced more flashbacks, more nightmares, and could experience strong emotions for a number of days after the session. The researcher explained that they could use the stabilisation techniques to help soothe themselves.

The researcher took the time to establish a stop signal with the participant, which took the form of raising their hand (Richman, 2004). It is preferable not to use the word 'stop' because it may be confused with the word 'stop' in a memory. Participants needed to know that at any time, should they have felt the process was too overwhelming, they had the ability to stop the processing temporarily. The participants also needed to understand that stopping the processing regularly could have delayed the processing. It was also reiterated that the participant was free to discontinue with the treatment at any time during the project, as the participation in the research was voluntary.

Participants were then introduced to the eye movements so they could become familiar with moving their eyes from side to side. In this study horizontal eye movements were used in the first instance. However, some participants may have responded more effectively to vertical or diagonal eye movements. The direction of eye movement was then adjusted to suit the participant. The speed of the eye movement also needed to be established, so that the eye

movements were as fast as possible but comfortable enough for the participant to track the researcher's fingers (Richman, 2004). If the participant wore glasses, the researcher established with the participant whether they felt more comfortable with the glasses on or off during the eye movements. The researcher established the appropriate distance from the participant. Some participants may have preferred the researcher to be further away when compared to others. Some participants may have felt threatened by a hand moving in front of their face. In such a case, the researcher held a pen to produce the eye movements to provide some distance from the participant (Shapiro, 2001).

The researcher took the time to address any fears the participant may have had and provided the participant with the opportunity to ask any questions. Participants may have had a variety of fears that needed to be addressed. For instance, some may have felt they would go mad if they got stuck in the memory, or they may have feared therapy would damage them. Others may have feared that they were being hypnotized or that they would lose control (Richman, 2004).

Describing the model, setting expectations, addressing fears, establishing the stop signal and establishing the eye movements, was all seen to be part of phase two of the EMDR treatment protocol, or the preparation phase (Shapiro, 2001; Richman, 2004).

4.5.5.7 Session six

The assessment phase, or phase three of the EMDR protocol, began in the sixth session. Phase three is called the assessment phase and should not be confused with the overall assessment and general history taking. The assessment in this phase refers to the assessment of the memory to be targeted for reprocessing (Shapiro, 2001; Richman, 2004). In this study, participants were encouraged to choose the most disturbing memory as the target

memory for reprocessing with EMDR. This memory could represent the aetiological memory as far as possible, or the earliest time that memory came up for the person.

Some participants may have chosen a disturbing memory of a single event, while others may have chosen a cluster of similar memories. For instance, one participant may have chosen a single event such as a road traffic accident, while another participant may have chosen a disturbing cluster of memories related to their partner over a number of years. Any of these could be targeted for reprocessing and the researcher let the participant decide on the final target memory for reprocessing (Richman, 2004). If the person chose a cluster of memories to work with, then the researcher asked the person to identify the most disturbing memory in that cluster, which then became the target memory. Often in EMDR there is a generalizing effect, in that if one memory is targeted and reprocessed, the disturbance of similar memories also decreases (Richman, 2004).

Once the target memory was established, the participant was asked to identify an image that could be used to represent or symbolise this trauma. At times this could be the worst or most disturbing image (Shapiro, 2001; Richman, 2004).

Once the target image was identified, then the negative cognition needed to be established. A negative cognition is a negative, irrational self-referencing belief that usually begins with an 'I' statement. The person was asked to hold the target image in mind and identify the negative self belief that went with the target image. This belief needed to be a presently held belief, in that the person still held this negative belief. The belief needed to be generalisable so that it could generalise to a variety of other associated memories. The belief also needed to resonate with the participant's associated affect (Shapiro, 2001; Richman, 2004).

Negative cognitions fall into four major categories, namely, safety, control, responsibility and self-defectiveness. Negative cognitions regarding safety include the

statements such as: I am vulnerable, I am in danger, I am not safe, or I am going to die.

Negative cognitions regarding control include statements such as: I am powerless, I am not in control, I am helpless and I cannot manage. Negative cognitions around the responsibility theme include; it is my fault, I am a bad person and I should have done more. Negative cognitions regarding self-defectiveness include; I am not good enough, I am worthless, I am a failure, and I am useless (Richman, 2004). The negative cognition is also not a statement of emotion or feeling, such as: I am sad, or I am guilty, nor is it a description of the trauma, such as: it was a terrible thing that happened (Richman, 2004).

Once the negative cognition had been established, the researcher went on to establish the positive cognition. The positive cognition is the desired alternative cognition that the participant preferred to accompany the target memory. The positive cognition needed to resonate with the negative cognition, or come from the same category. For instance, the positive cognition of 'I am strong' is in the same category as the negative cognition 'I am weak'. In this case, both the negative and the positive cognitions are from the self-defective category. However, the positive cognition should not be the negative of the negative cognition. For instance, it should not be 'I am *not* weak'. The positive cognition is also a self-referencing belief and is a believable hoped for goal. The positive cognition should also be generalisable to other memories and situations. Positive cognitions should not be absolute statement, so the researcher should avoid words like always and never. The positive cognition is also not a magical thought about changing the past events or qualities of others. For instance, I wish it did not happen (Shapiro, 2001; Richman, 2004). Positive cognitions regarding safety include the statements such as: it is over, I am safe now. Positive cognitions regarding control include statements such as: I have choices, I am now in control, and I can manage. Positive cognitions around the responsibility theme include; I did the best I could.

Positive cognitions regarding self-defectiveness include; I am okay, I am a loving person, I am worthwhile, or I am valuable (Richman, 2004).

Once the positive cognition has been established, then the validity of the cognition is established. The validity of the desired cognition (VOC) is a scale that represents how true the positive cognition is, with a score of one being completely false (VOC=1) and a score of seven being completely true (VOC=7). If the validity of desired cognition was one then the researcher checked the appropriateness of the positive cognition. The validity of desired cognition should be at least two (VOC=2) to ensure the goal is attainable (Shapiro, 2001; Richman, 2004). For instance, a person may score the VOC=1 for the positive cognition 'I am strong', which they report is impossible to believe when recalling the disturbing event. In such a case, the positive cognition could be reworked to 'I can begin to believe that I am strong enough', for which the participant may give a VOC=2, which becomes a more attainable goal.

The next step was to identify the emotions that are associated with the target image and negative cognition. For instance, the researcher would have said to the participant, 'When you think about the most disturbing image and your belief that 'I am weak', what emotions do you feel now? The participant would have then described their emotions associated with the target memory (Shapiro, 2001; Richman, 2004).

The participant was then asked for the subjective unit of disturbance (SUD). The subjective unit of disturbance is represented on a scale from zero to ten, with zero representing no disturbance or a calm neutral state, and ten representing the worst possible disturbance. The participant needed to report their subjective level of disturbance on a scale from zero to ten when the target image and negative cognition is brought to mind (Shapiro, 2001; Richman, 2004).

The last part of the assessment phase was the identification of the associated body sensations. While holding the target image and negative cognition in mind, the participant was asked to identify the location of the disturbance in their body. If the participant reported feeling numb, then the researcher would have asked where in the body the numbness is felt. At times participants may have responded that they felt the distress in their stomach, or tightness in their chest or throat, or tension in their shoulders (Shapiro, 2001; Richman, 2004).

The assessment phase generally did not take up all the time of the sixth session, so the desensitisation phase could begin in the sixth session.

4.5.5.8 Subsequent sessions

The desensitization phase is the phase in which the actual eye movements take place with the aim of desensitising the disturbing traumatic memory. The researcher asked the participant to bring the target image to mind together with the associated negative cognition and to notice where they felt it in their body while following the researcher's fingers that move from left to right to left, in line with their eyes. The researcher went at a pace that was fast enough for the participant to manage comfortably. Generally a set of eye movements consists of 20 eye movements, but instead of counting the researcher tuned into the participant's response. During the eye movements, the researcher tuned into the participant's facial and body movements, and stopped the eye movements when the participant seemed to have reached a plateau. If the participant began abreacting, then the researcher made support comments, such as; 'Just notice. Just observe. That's it. It is old stuff'. Abreactions are emotions that are experienced at a high level of intensity, and the participant may have for instance, cried uncontrollably or expressed intense fear. The researcher did not stop the eye movements, so as not to reinforce the avoidance mechanism. Rather the researcher continued the eye movements though the abreaction. The researcher also used metaphors, such as; 'it is

just scenery you are passing, which you are noticing from your train' (Shapiro, 2001; Richman, 2004).

At the end of a set of eye movements, the researcher asked the participants what they noticed during the set. The researcher allowed the participants time to relay the things they noticed during the eye movements. After the participants reported what they had noticed, the researcher proceeded with the next set of eye movements by simply saying 'go with that'. The researcher did not add in any extra words, as the researcher did not want to influence the direction of the participants processing. For instance, the researcher did not say, 'go with that *feeling*', or 'go with that *thought*', so as not to distract the natural flow of the processing (Richman, 2004).

Eventually the participant would come to the end of an associative chain of memories, or come to the end of a channel, often stating they 'got nothing'. If the subjective unit of disturbance was not zero, then the researcher would return to the target image and begin the process of eye movements again. This process needed to continue until the subjective unit of disturbance was zero, or as close to zero as possible. If the participant described new material or any other disturbance, then the researcher needed to continue with that line of associative memories. Some participants with a simple trauma may only have had a single chain of associative memories linked to the original traumatic image. But others may have had multiple chains of associative memories for a single incident. For instance, a person in a road traffic accident may have had a chain of memories associated with the impact, the hospitalisation, the police questioning, an inquest, and the litigation process. A participant with a cluster of memories around one person or one event may have had a variety of chains of association and the researcher needed to continue the eye movements until all associated memories were reprocessed (Richman, 2004). For instance, a participant may have reported a

number of similar memories relating to domestic violence from their partner over a number of years, and then all these similar events would be reprocessed using EMDR.

At times it would become evident that no change was taking place and the SUDs were not reducing. It would seem that the participant was going over the same material, or looping, with no adaptive resolution. To help unblock these processes, the researcher would change the direction of the eye movements, from vertical to diagonal or horizontal. The speed of the eye movements could also be changed. The researcher could also get the participant to change the focus, perhaps onto the body sensation or the feelings. If these did not cause any shifts in the processing of the memory, then the researcher would introduce a cognitive interweave (Shapiro, 2001; Richman, 2003).

A cognitive interweave in EMDR is a statement that originates with the researcher which is interlaced with the material generated by the participant. These statements are designed to elicit thoughts, actions and imagery from the participant, with the purpose of facilitating the processing and not distracting the process. This would accomplish movement in the process without derailing the processing. For instance, if the participant was struggling with notion of misplaced responsibility, the researcher could ask ‘who carries the responsibility?’ If the participant repeatedly struggles with feelings of not being safe, the researcher could add, ‘how are you safe now?’ If the participant struggles with notions of the inability to make choices, the researcher could add, ‘as an adult can you choose now?’ (Shapiro, 2001; Richman, 2003).

During the processing of the target memory with eye movements, the researcher would note any shifts that occur. This could have been the change in content, emotions, body sensations or thoughts, as they became more adaptive. The participant may have reported that the image was no longer as vivid or disturbing, emotions lose their intensity, body sensations were no longer experienced, and their thoughts were more adaptive. Interestingly, people

often report that once the most disturbing part of the memory becomes less disturbing, they begin to remember more details of the event. Remarkably, the more detail they remember the less disturbing the incident seems to become. By the time the SUDs have reduced to zero, people report that they know the event occurred but they now longer experience the event as disturbing. Instead of being a non-declarative memory that is experienced as disturbing, the memory has now become a factual declarative memory that the person can talk about without distress (van der Kolk, 1994; Shapiro, 2001).

The eye movements would continue until all the associated memories and all the associative channels were reprocessed. Alternatively, the eye movements continued until there was no more change and the subjective unit of disturbance had reduced to zero, or as close to zero as possible (Shapiro, 2001; Richman, 2004).

Some participants may have experienced a complete reduction in the subjective unit of disturbance in one session. However, other participants may have needed a number of sessions for their disturbance to reduce completely. If the participant's subjective unit of disturbance was greater than one ($SUD > 1$) at the end of the session, then the session was considered incomplete. The researcher would not do the installation of positive cognition and body scan at this point, as the material still needed further reprocessing in the next session. The researcher would have brought the session to a close. Closure is considered part of the seventh phase of the EMDR protocol (Shapiro, 2001; Richman, 2004). The researcher would have worked with participants to provide them as much control over the process as possible. For instance, towards the end of the session the researcher would have mentioned that the session was drawing to a close. The closure of the session is designed to acknowledge what the participant had accomplished in the session and also to leave the participant well grounded before leaving, therefore sufficient time was left at the end of the session for closure (Richman, 2004). If the participant was highly aroused, or abreacting towards the end of the

session, then the researcher included a nice place exercise at the end of the sessions to help soothe the person. The researcher gave the participants encouragement and support for the effort made during the session. The participants were also debriefed about the possible effects after the EMDR treatment and were encouraged to make a note of what they experienced between sessions.

In this research study, each treatment session was 60 minutes long, which provided approximately five minutes of feedback time at the beginning of the session, 45 minutes of eye movements, and ten minutes to close the session down and debrief the participant.

If the subjective unit of disturbance had reduced to zero in a session and all the associative channels of the target memory had been reprocessed, then the researcher went onto install the positive cognition. This phase is the fifth phase of the EMDR protocol and links the original target memory with the desired positive cognition (Shapiro, 2001; Richman, 2004). The researcher reminded the participant of the positive cognition initially chosen and asked whether this cognition was still suitable or whether another positive cognition was more valid. The researcher asked the participant to think about the positive cognition and rate it on the validity of positive cognition scale (VOC) with one being completely false (VOC=1) and seven being completely true (VOC=7). The researcher then asked the participant to hold the positive cognition together with the original target memory, while doing a few sets of eye movements. The researcher then enquired how true the positive cognition felt. The installation needed to continue until the VOC score was seven. If a participant reported a score of six on the VOC scale then the researcher needed to do some more sets of eye movements to strengthen the installation as much as possible (Shapiro, 2001; Richman, 2004). If the VOC score did not rise above six (VOC=6) then the researcher needed to ask the participant what prevented it from being a seven (VOC=7). The appropriateness of the

positive cognition or the blocked belief may have needed to be addressed. The researcher worked with the participant until the VOC was as close to seven as possible.

After the installation of the positive cognition, the participant was asked to close their eyes and hold the initial disturbing target image together with the positive cognition while mentally scanning their body. If any disturbing sensations were reported, more sets of eye movements were needed until there were no more disturbing body sensations. If the participant reported comfortable sensations, then a few additional sets of eye movements were done to install and strengthen the positive feeling. The final goal was for the subjective unit of disturbance to reduce to zero, the validity of cognition to increase to seven and the participant to feel no disturbing body sensations when recalling the initially disturbing target memory (Shapiro, 2001; Richman, 2004). Once this had occurred, the reprocessing was considered complete and a measurement was taken. A measurement occurred after each disturbing memory was reprocessed using EMDR in an attempt to ascertain the overall effects of the reduction of disturbance for each reported trauma.

4.5.5.9 Follow-up session

At the end of the research study, all the participants were invited back for a final follow-up measurement. This follow-up measurement occurred at least six months and up to 36 months after the completion of the EMDR treatment, depending on when participants completed their treatment in relation to the end of the project. The follow-up measurement corresponded to the re-evaluation phase. The purpose of the re-evaluation phase was to provide an opportunity to re-access the original target memory to establish if the original traumatic memory had been resolved and the subjective unit of disturbance had remained at zero or one. At the follow-up measurement, the researcher evaluated if adequate assimilation had occurred.

The follow-up measurement at end of the study was included in the design of this research study, which is different to other studies that have done their follow-up at three-month (Marcus, et al, 1997; Rothbaum, 1997; Carlson, et al, 1998; Scheck, et al, 1998; Devilly, et al, 1999; Edmonds, et al, 1999; Ironson, et al, 2002; Lee, et al, 2002), six-month (Marcus, et al, 2004; Rothbaum, et al, 2005; van der Kolk, 2007), nine-month (Sprang, 2001); 15-month (Wilson, et al, 1997; Power, et al, 2002), and five year follow-up (Pitman, et al, 1996). Doing the follow-up measurement at the end of this research provided data over a period of time from six-months to 36-months. This provided an indication of whether the gains were maintained continuously over a period of time.

The researcher acknowledges that because of the length of time between the start of the study to the end of the study, some participants would only be measured up to three years later, and other factors may have influenced their symptoms. Some factors, such as change in medication and other psychological therapies, may have contributed to the gains achieved, while other factors may have interfered with the gains achieved, for instance, a participant being involved in a road traffic accident. These other factors however were not controlled for due to lack of resources. By investigating a range of follow-up times, this research study could see if the gains were maintained over a period of time.

4.5.6 Attrition

This research study only analysed the completers of the full EMDR protocol treatment. This meant that only the data from people who completed the first assessment, the full EMDR treatment of at least one trauma and the last assessment was used for analysis. The attrition rate was noted for those who started the EMDR treatment but failed to complete the treatment or last measurement.

4.5.7 Measurement

The measuring instruments used in this study were the MCMI-III and the DES-II. These instruments were used before and after the treatment of a trauma with EMDR and as a follow-up measurement, to measure treatment effects and maintenance of gains. The measuring instruments were administered by an assistant psychologist in the first instance or by the researcher if the assistant was away on vacation. The assistant psychologist was blind to the research question but not blind to the treatment. The scoring of all the instruments was double checked by both the researcher and the assistant psychologist. The assistant psychologist had an Honours degree in psychology.

4.5.7.1 Millon Clinical Multiaxial Inventory-III (MCMI-III)

The MCMI-III (Millon, 1997) is a 175 items self-reporting instrument and was designed to provide measures of personality patterns and clinical syndromes, which are clustered together to reflect the Axis I and Axis II distinction on the DSM-III and DSM-IV. The MCMI-III is made up of 24 scales that reflect the enduring relationship between personality patterns and clinical syndromes. A cut off score of 75 or more is seen to be indicative of a clinically significant diagnosis. The MCMI-III is the result of the refinement of the MCMI and MCMI-II, and also presents modifying indices that provides a disclosure measure, a desirability measure, a debasement measure and a measure of validity. The instrument is geared towards an eighth grade reading level and people answered either true or false. The MCMI has been well used in research with more than 600 studies using it in a significant manner (Millon, 1997). The MCMI-III has been based on the MCMI-II, which was developed from the MCMI.

- The items for the clinical syndrome scales on the MCMI-III were generated to conform to the DSM criteria. During the construction of these scales, items with a high correlation with scales for which they were not intended were dropped or refined against the theoretical criteria and reassigned or reweighted (Millon, 1997). The seven clinical syndrome scales have high levels of internal consistency: anxiety disorder (.86), somatoform disorder (.86), bipolar manic (.71), dysthymia (.88), alcohol dependence (.82), drug dependence (.83), and post traumatic stress disorder (.89) (Millon, 1997). The three severe clinical scales also have high levels of internal consistency: thought disorder (.87), major depression (.90), and delusional disorder (.79). The alphas exceed .80 for eight of these ten scales. (See Appendix 2.1 for MCMI-III Test-Retest reliability.)

This research study was particularly interested in the major depression and dysthymia scale on the MCMI-III. Most other EMDR research studies have used the Beck Depression Inventory (BDI) to measure the effects of EMDR on depressive symptoms. There are high correlations between the MCMI-III and the BDI with major depression at .74 and dysthymia at .71 (Millon, 1997). (See Appendix 2.2 for correlations of all the MCMI-III clinical scales to the BDI.)

This research also analysed the effect of EMDR on anxiety. Other studies have in the main used the State-Trait Anxiety Inventory (STAI) to measure the effects of EMDR treatment on anxiety symptoms. Surprisingly, the state anxiety scale on the STAI correlates most highly with the MCMI-III major depression scale at .65, then with dysthymia at .60, and finally with anxiety disorder at .55. The trait anxiety scale on the STAI correlates most highly with the MCMI-III dysthymia scale at .68, then with major depression at .67, and finally with anxiety disorder at

.58 (Millon, 1997). (See Appendix 2.2 for correlations of all MCMI-III clinical scales to the STAI.)

- The personality patterns delineated in the MCMI-III are based in the theory of personality and the inventory provides an operational measure of these patterns (Millon, 1969/1983, 1986a, 1986b, Millon & Davis, 1996). Most of the eleven clinical personality pattern scales have high levels of internal consistency: schizoid (.81), avoidant (.89), depressive (.89), dependent (.85), histrionic (.81), narcissistic (.67), antisocial (.77), sadistic (aggressive) (.79), compulsive (.66), negativistic (passive-aggressive) (.83), and masochistic (self-defeating) (.87). The three severe personality pathology scales also have high levels of internal consistency: schizotypal (.85), borderline (.85), and paranoid (.84). The alphas exceed .77 for ten of the fourteen scales (Millon, 1997). (See Appendix 2.1 for MCMI-III Test-Retest reliability.)

This research study was particularly interested in the depressive personality pattern scale. The correlation between the BDI and the depressive personality scale is .56. The correlation between the State Anxiety subscale on the STAI and the depressive personality pattern on the MCMI-III is .53. The correlation between the Trait Anxiety subscale on the STAI and the depressive personality scale on the MCMI-III is .62 (Millon, 1997). (See Appendix 2.2 for the correlations of all the clinical personality patterns to the BDI and STAI.)

The MCMI-III measures 11 different personality patterns: schizoid, avoidant, depressive, dependent, histrionic, narcissistic, antisocial, sadistic (aggressive), compulsive, negativistic (passive-aggressive), and masochistic (self defeating). The schizoid personality

pattern represents the passive-detached personality type, with characteristics such as; detachment, behavioral withdrawal, emotional suppression, feelings of emptiness and irresponsibility. This personality type has difficulties forming and maintaining relationship, and prefers a solitary life. They appear introverted with a flat affect, require little affection, and lack warmth and emotional expression. This scale measures the restricted emotional expression and severe relationship deficits (Millon, 1997; Craig, 2008).

The avoidant personality pattern represents the active-detached personality type, with characteristics such as; avoidance of social situations, feelings of rejection, anhedonia, worthlessness and self-blame. They are keen to relate socially but expect criticism, disapproval and depreciation, so tend to withdrawal or reduce social contact (Millon, 1997; Craig, 2008).

The depressive personality pattern also represents the passive-detached personality type, with characteristics such as; feelings of failure, inadequacy, pessimism, guilt, emptiness, anhedonia and recurrent sadness. This personality type tends to worry excessively and is self-critical regardless of their level of accomplishment. Their pessimism leads to self-defeating behaviour as they feel it is futile to make improvements in themselves and in their relationships. They tend to be overly dependent on others and often make others feel guilty around them because they are quite hard to please (Millon, 1997; Craig, 2008).

The dependent personality pattern represents the passive-dependent personality type, with characteristics such as; submissiveness, passiveness, feelings of insecurity, abandonment fears, tendencies to acquiesce and conform, and lack of confidence and autonomy. This personality type tries to avoid conflict, so tends to pacify. They need to be nurtured so look for people to take care of them and tend to be overly compliant to avoid abandonment (Millon, 1997; Craig, 2008).

The histrionic personality pattern represents the active-dependent personality type, with characteristics such as; extrovert style of relating, and is very gregarious but tends to manipulate people into receiving attention and approval. This personality style tends to be seductive and flirtatious in thought, manner and style, seeking constant attention, excitement and praise. They display feelings easily and have frequent emotional outbursts. Because of their dramatic nature and self-centeredness, their relationships are often superficial and strained. However, factor analysis studies have shown that the histrionic personality type on the MCMI-III is positive correlated with mental health and negatively correlated with emotional maladjustment (Millon, 1997; Craig, 2008).

The narcissistic personality pattern represents the passive-independent type, with characteristics such as; feelings of superiority, grandiosity, independence, arrogance and conceitedness. This personality type tends to be very self-centred and needs recognition and constant admiration for their special qualities. They tend to exploit relationships for self-gain and can feel excessively entitled to special favours because of who they are. However, research has shown that elevated scores on the narcissistic scale on the MCMI-III can be positively correlated with a healthy adaptive personality style (Millon, 1997; Craig, 2008).

The antisocial personality pattern represents the active-independent personality type, and is characterised by a motivation to avoid being controlled or dominated. This personality pattern tends to dominate and intimidate, whilst being aggressive, competitive, argumentative, vengeful and independent. They often harbour resentment and tend to have hostile disposition. Intimacy, warmth and gentleness are seen as a sign of weakness. They provoke people to instil fear, and acting out is their primary defence (Millon, 1997; Craig, 2008).

The sadistic (aggressive) personality pattern represents the active-discordant personality type, with characteristics such as being controlling and aggressive. They tend to be intimidating, antagonistic, disagreeable, arrogant, and hostile with explosive outbursts and

use brute force when angered. Because of their aggressive personality, they tend to have marital difficulties and possible difficulties with the legal system (Millon, 1997; Craig, 2008).

The compulsive personality pattern represents the passive-ambivalent personality type, with characteristics such as rigidity, organised and obedient behaviour, good morals, perfectionism, and cooperative. This personality type tends to be over conforming, respectful, flexible and conscientious. They avoid criticism and fear social disapproval, and suppress their resentment and anger towards people whose approval they seek. They have a strong sense of duty and use achievements to feel worthwhile (Millon, 1997; Craig, 2008).

The negativistic (passive-aggressive) personality pattern represents the active-ambivalent personality type, with characteristics such as impulsivity, hostility, irritability, sceptical and being disgruntled. This type of personality indicates a serious psychiatric disorder with a loss of control over emotions, especially anger, together with cruel behaviours. They tend to be petulant and sulk over feeling unappreciated and are constantly disillusioned (Millon, 1997; Craig, 2008).

The masochistic (self-defeating) personality pattern represents the passive-discordant personality type, with characteristics such as submissive, martyr-like behaviour and allowing themselves to be dominated. They often seek a relationship in which they can feel secure but inferior as they feel like they deserve to suffer. They seek out affection in a relationship but may be victimised (Millon, 1997; Craig, 2008).

The MCMI-III also measures severe personality patterns. On the MCMI-III there are three different severe personality pattern scales, namely schizotypal, borderline and paranoid.

The schizotypal severe personality pattern generally characterises a person with almost no personal attachments who remains on the margins of society (Millon, 2007; Craig, 2008). The person tends to be absorbed in their own thoughts, and their cognitive processes

may be irrelevant, tangential, or confused. With sufficient stress, the person may develop a psychotic disorder such as schizophrenia (Craig, 2008).

The borderline severe personality pattern represents a pattern of behaviour that is characterised by erratic unstable moods, intense unstable relationships, strong dependency needs, strong abandonment fears, a lack of a clear identity, engagement in impulsive behaviours, and constantly seeking attention and approval (Craig, 2008). Other characteristics include self-harming and gestures of suicide. The borderline personality pattern is generally associated with other psychiatric disorders (Millon, 2007; Craig, 2008).

The person with paranoid severe personality pattern tends to present characteristics such as: irritable, hostile, abrasive, argumentative, and often extremely mistrustful of people as they imagine people are trying to control them (Millon, 2007; Craig, 2008). Their thoughts are often rigid with delusions of persecution or grandeur, and they have ideas of reference (Craig, 2008).

The MCMI-III delineates three different unipolar depressive constructs namely major depression, dysthymia and depressive personality pattern.

The major depression scale has certain prototypal items that differentiate this type of depression from the other depressive scales. People with clinically significant major depression report that they feel terribly depressed and sad much of the time for no reason, have completely lost their appetite, their strength is drained out of them even in the morning and looking at the day ahead makes them feel terribly depressed. They also report that they have seriously thought of doing away with themselves.

The prototypal items on the dysthymia scale include people reporting that they have felt like a failure for some years, they feel guilty because they cannot seem to do things right,

they have become discouraged and sad, they have lost interest in things they previously enjoyed, and do not seem to have the energy to concentrate on their daily responsibilities.

People who have clinically significant depressive personality scale tend to see themselves as of no account and valueless, and portray a permanent sense of hopelessness with a grief stricken quality. They have a fatalistic attitude and tend to punish themselves harshly. They fear abandonment, plead for nurturing and often demand affection. Their defence mechanisms are impoverished with a diminished capacity to self-regulate their affect and impulses.

4.5.7.2 Dissociative Experience Scale II (DES-II)

The Dissociative Experience Scale II (DES-II) (Bernstein & Putnam, 1986; Carlson & Putnam, 1993, 2000) is a 28-item self-report scale that is used to quantify the nature, intensity and frequency of a number of dissociative experiences including dissociation, derealisation, depersonalisation, absorption and amnesia. The DES-II requires participants to circle the percentage of time they experience an item. The DES-II is designed to be used in both clinical and non clinical populations and is reported to have satisfactory internal consistency with coefficient alpha value for college students ranging from .92 to .94 (Gibbs & Rude, 2004; Zingrone & Alvarado, 2001). A score of 30 or greater on the Dissociative Experience Scale-II is often used as a possible indicator of dissociative disorder (Rothbaum, 1997).

4.5.8 Analysis of data

The data analysis was conducted by the researcher, with an objective independent statistical analysis being completed by a medical statistician at Southmead Hospital, Bristol, to avoid bias. The Statistical Analysis System (SAS) was used to analyse the data.

The measurements that were analysed were:

- The first and second measurement.

The first measurement was the measurement taken before EMDR treatment started. The second measurement was taken after the treatment of one trauma or after subjective unit of disturbance of the first trauma treated had reduced to zero using EMDR.

- The first and last measurement.

The first measurement was the measurement taken before EMDR treatment started. The last measurement was taken at the end of the EMDR treatment. For some participants, the last measurement was taken after the treatment of one trauma, while for other participants the last measurement was taken after the treatment of two to three traumas.

- The first and follow-up measurement

The first measurement was the measurement taken before EMDR treatment started. The follow-up measurement was taken at the end of the research study, when all the participants were called back for a final measure to see if the gains were maintained.

- The last and follow-up measurement

The last measurement was the measurement taken at the end of EMDR treatment. The follow-up measurement was taken at the end of the research study, when all the participants were called back for a final measure to see if the gains were maintained.

The Kolmogorov-Smirnov test combined with the distribution of each symptom and a normal distribution overlay was used to test for normality. Variables not normally distributed were transformed to ensure normality.

A paired t-test was performed on all personality patterns and clinical syndromes that were normally distributed to determine whether the change was significant. If a variable could not be successfully transformed into a normal distribution, then a non-parametric test, the rank sign test was used to test for a significant difference (Kirkwood & Sterne, 2003).

The association between depressive constructs and other clinical syndromes, post traumatic stress and anxiety, was tested by using the Spearman rank correlation coefficient and the associated p-value (Kirkwood & Sterne, 2003).

4.5.9 Gold standard scale

According to Kazdin & Bass (1989), the research design can influence treatment effects and interfere with the detection of true treatment effects. Maxfield & Hyer (2002) developed the Revised Gold Standard (RGS) Scale that outlines the criteria for methodological rigor, which allows for more accurate detection of true treatment effects and decreases error measurement. The RGS Scale was based on the original Gold Standard (GS) Scale developed by Foa & Meadows (1997).

The RGS Scale delineates the following criteria for methodological rigor (Maxfield & Hyer, 2002):

Clearly defined target symptoms.

The diagnosis has to be specified for the target to be clearly defined. In addition, a study should have specific inclusion and exclusion criteria. This research study met this criterion as the clinical syndromes and personality patterns under investigation were diagnosed using the MCMI-III criteria. In addition, this research study used specific inclusion and exclusion criteria.

Reliable and valid measures.

To ensure methodological rigor, measures with good psychometric properties should be used that are able to detect the change related to the treatment. In this research study the MCMI-III and the DES-II were used to capture the change in clinical syndromes and personality patterns. The MCMI-III has vigorous psychometric properties.

Use of blind independent assessors.

The use of blind independent assessors minimise the influence of bias in a number of ways. For instance, the therapeutic alliance may influence the process if the assessors are not independent. In addition, if the assessor is not blind to the research question, this could influence how they interact with and evaluate participants. This research study unfortunately did not have blind independent assessors due to the lack of funds, since these would have been costly to employ. In order to minimise the influence of bias, self-reporting instruments were used and the participants were left on their own to complete the instruments. In addition, the assistant psychologist who administered most of the instruments was blind to the research question. However, she was not blind to the EMDR treatment and became familiar with the treatment results. The scoring of all the instruments was double checked to ensure accuracy.

Multi-modal assessment.

There is an assumption that multi-modal assessment that includes the assessment of a wide range of pathology by using interview, self-reporting, behavioural and physiological measures, is more accurate than self-reporting instruments alone. Unfortunately this research study did not have the financial resources to undertake a multi-modal assessment, and was only able to use self-reporting instruments.

Assessor reliability.

For methodological rigor, the assessor should be trained to ensure the standardised administration of the self-reported measures and reliability checks should be completed thorough the study. In this research, the assistant psychologist was trained by the researcher to administer the MCMI-III and the DES-II. However, reliability checks were not done during the study.

Manualised treatment.

To ensure methodological rigor, treatment has to be conducted in accordance with a treatment manual. In this research, the full EMDR protocol was used according to the Richman EMDR treatment manual, which is accredited by the EMDR Institute in USA.

Random assignment.

An integral part of a controlled study is the random assignment of participants to different therapists and different treatment conditions. In this research study, unfortunately due to lack of resources the researcher was the only therapist and there were no control groups.

Treatment fidelity.

According to Elkin (1999) the competence of the therapist is crucial in assessing for outcomes. Fidelity checks ensure that the standard protocol is adhered too. In this research study, one session was video taped showing the assessment and desensitisation phase of the EMDR protocol, and was assessed by an accredited Europe Approved EMDR Consultant. It was assessed according to the Consultant's own opinion. However this fidelity check may

only be deemed as less than optimal compared to studies that tape every session and validated by externally assessors, which was not possible in this research study due to lack of resources.

Adequate course of treatment.

A true treatment effect would not be realised if insufficient treatment is provided. In this research study, sufficient treatment was offered to participants to reduce the subjective unit of disturbance to zero (SUD=0). Therefore, no limit was placed on the number of sessions participants would need.

No concurrent treatment.

Undergoing other psychological treatment concurrently will obscure true effects of the EMDR treatment and be exposed to a Type II error. In this research study, the person was excluded from the study if they were undergoing other psychological treatment. If the participants were taking psychotropic medication, then they were asked to make no changes to their medications during the treatment. The participants had to be taking their psychotropic medication for at least three months before their enrolment in this research study.

When evaluating this research study against the Revised Gold Standard (RGS) Scale, this research fulfilled five of the stated criteria, namely; clearly defined target symptoms, reliable and valid measures, manualised treatment, no concurrent psychological treatment, and adequate course of treatment. This research study also partially fulfilled two of the stated criteria, namely; fidelity checks which may be deemed as less than optimal, and a trained assessor who was not blind and independent. This research did not fully fulfil the five criteria, namely, blind independent assessment, multi-modal assessment, assessor reliability, random assignment, and independent vigorous fidelity checks.

4.6 Summary of research design

This chapter outlined the research design. This research study investigated the effects of EMDR treatment on the change in clinical personality patterns [schizoid, avoidant, depressive, dependent, histrionic, narcissistic, antisocial, sadistic, compulsive, negativistic, and masochistic], severe personality patterns [borderline, schizotypal, and paranoid], depressive constructs [major depression, dysthymia and depressive personality], other clinical syndromes [post traumatic stress and anxiety], severe clinical syndromes [bipolar, thought disorder, delusional disorder, and alcohol and drug dependence] on the MCMI-III, and dissociation as measured on the DES-II. The study also investigated whether any significant EMDR treatment effects were maintained at the follow-up measurement at the end of the study. The inclusion and exclusion criterion were also delineated. People who met the criteria for participation underwent the full EMDR protocol according to the Richman training manual, which was accredited by the EMDR Institute, USA. The MCMI-III and DES-II were used as measuring instruments. These were used to provide data to calculate the difference between the measurements taken before EMDR treatment and after the treatment of one trauma, and before EMDR treatment and at the end of the EMDR treatment. The study also evaluated whether any gains were maintained by means of a follow-up measurement that was done at the end of the research project. The data were analysed using SAS.

Chapter 5: Data analysis

This chapter will outline the data analysis phase of the research study. Firstly, this chapter will outline the demographic findings, including number of participants, gender and age of participants, types of traumas treated and the number of treatment sessions.

Then this chapter will then present the analysis of the four measurements of the data, namely:

- the analysis between the first measurement before EMDR treatment and the measurement after the EMDR treatment of one trauma.
- the analysis between the first measurement before EMDR treatment and the last measurement at the end of EMDR treatment, which may be after the treatment of one trauma or multiple traumas.
- the analysis between the first measurement before EMDR treatment and the follow-up measurement at the end of the research study.
- the analysis between the last measurement at the end of the EMDR treatment and the follow-up measurement at the end of the research study, which is between 6- to 36-months.

5.1 Demographics

5.1.1 Number of participants

One hundred and four people were identified by the GPs as possible candidates for the research study. All of these received a written invitation to attend an initial consultation, in which they would receive the details about the treatment and the study.

Twenty eight people did not attend the initial consultation. Eighteen did not respond to the invitation and ten people phoned the Clinic to say they did not want to undergo therapy.

Seventy six people attended the initial consultation. Three people did not return after the initial consultation. All of these were male. One had run over his toddler who now has

brain damage, the other found his girlfriend's body after she had hanged herself, and the third was extremely insulted to find that he would be treated by a female as he felt females should not be educated.

Of the 76 people who attended the initial consultation, 16 people did not meet the criteria for participation in the study for a number of reasons, and did not undergo the MCMI-III:

- Two people displayed symptoms of severe dissociation during the initial consultation and were referred to NHS Secondary Care Service.
- One person reported post natal depression with suicidal intent, so was referred to the NHS Counselling Services.
- Two people were currently taking amitriptyline and were referred to the NHS Counselling Service.
- Two people reported severe heart conditions, with one awaiting a major heart operation. These were referred back to their GP.
- Five people had been involved in a road traffic accident and were currently involved in medico-legal investigations and litigation. These people were referred to their solicitors, who would organise private psychological care for them.
- One person reported that as a child she witnessed her father kill her new born baby brother and bury him in the garden. The case was referred to the Police Public Protection Unit. This person was invited to return for EMDR therapy after the Police investigation.
- Two people were injured in work place accidents and were currently involved in a litigation and medico-legal process. These people would obtain psychological therapy through their work place so that their progress could be monitored.
- One person was under the age of 18 years old and was referred to the NHS Counselling Service.

Fifty seven people returned after the initial consultation and underwent the MCMI-III and DES-II. Of these 12 people did not meet the criteria for participation in the study for a number of reasons:

- Two people met the diagnosis for psychotic disorder on the MCMI-III and were referred to NHS Secondary Care Service.
- One person met the diagnosis for bipolar (manic) on the MCMI-III and was referred to NHS Secondary Care Service.
- Two people met the diagnosis for borderline personality disorder on the MCMI-III and were referred to NHS Secondary Care Service.
- Three people were alcohol dependent and were referred to the Drug and Alcohol Service.
- One person was drug dependent and was referred to the Drug and Alcohol Service.
- Three people had no clinically significant symptoms on the MCMI-III and were referred back to their GP.

Five people decided not to go ahead with EMDR treatment, even though they fulfilled the criteria to be able to participate in the study. One was a combat veteran who received a place on a CBT treatment programme offered by a Clinic associated with the military. Another combat veteran decided to attend a Post Traumatic Stress CBT group instead of doing EMDR. One female decided that her difficulties were related to physical complaints and were not psychological. Two other people decided not to go ahead with therapy.

Of the 40 people who started the full EMDR protocol treatment:

- Thirty two completed the full treatment protocol and completed the necessary assessments after each trauma was reprocessed using EMDR.

- One person completed the full treatment, but the researcher was unable to administer the assessment after each trauma was reprocessed because the memories of the distinct traumas became intertwined during reprocessing and there was no clear cut off point for measurement. The researcher will discuss this as a case study.
- One person completed the full treatment. However, the final MCMI-III assessment was invalid because he randomly completed the true and false answers without reading the questions.
- One person left the study after two EMDR eye movement sessions, as she was unable to cope with the intensity of the hyper arousal. She was referred back to her GP.
- One person underwent about three EMDR eye movement sessions but no processing seemed to occur. After each set of eye movements, the researcher would ask the person ‘what did he get?’, or ‘what did he notice?’, or ‘what images came to mind?’ or ‘what did he feel?’ or ‘where in his body he felt it?’, and he repeatedly answered ‘nothing’. After a considerable period of no response, the researcher suggested that perhaps he may be better suited to a different form of therapy and he was referred to the NHS Counselling Service.
- Four people were referred to other NHS Counselling Services after the research study was suddenly closed down for 6 weeks, as the NHS had forgotten to process the researcher’s CRB check before the study started. A CRB check, or Criminal Record Bureau check, is done to ensure nobody with a certain kind of criminal record works with vulnerable people. The study resumed after the CRB check was approved. However, none of the four participants chose to return to the study.

The focus of this data analysis is the 32 people who completed the full EMDR treatment protocol and assessments according to the standardised protocol outlined in the research design.

5.1.2 Gender of participants

Out of the 32 participants who completed treatment, 20 were female and 12 participants were male. All the participants were white British.

5.1.3 Age of participants

The youngest of the 32 participants who completed treatment was 23 years old and the oldest participant was 65 years old. The mean age was 42.78 years old. Four participants were in their twenties, nine participants were in their thirties, nine participants were in their forties, seven participants were in their fifties, and three participants were in their sixties.

5.1.4 Type of trauma

In order to participate in this research study, the participants were to be experiencing distress following a life threatening or distressing event. Out of the 32 participants, 21 participants (65.6%) were personally involved in at least one life threatening event, eight participants (25%) witnessed at least one life threatening event, and three participants (9.4%) were not exposed to a life threatening event. (See Appendix 3.1 Types of trauma treated for each participant.)

Out of the 32 participants who completed the EMDR treatment, six participants reported childhood trauma only, 22 participants reported adulthood trauma only, and four participants reported experiencing both childhood and adult trauma. The traumas reported were not necessarily the traumas that were treated with EMDR, as the SUDs of these traumas may have already reduced to zero.

The 32 participants underwent EMDR treatment for 47 traumas (n=47). The distribution of the types of trauma is outlined below in Table 1.

Table 1. Distribution of types of traumas treated (n = 47)

Child sexual abuse (fondling)	2
Child sexual assault (rape)	1
Childhood bullying – with severe physical assault	2
Childhood bullying – name calling and rejection	1
Child burn victim	1
Adult physical assault	4
Other adult victimisation	3
Domestic violence	3
Road traffic accident –personally involved	5
Road traffic accident – witnessing fatality	2
Traumatic birth	4
Traumatic loss/illness	7
Termination	2
War	3
Relationship difficulty	7

5.2 Analysis of number of treatment sessions

Out of the 32 participants, 19 participants underwent EMDR treatment for one trauma, 11 participants underwent EMDR treatment for two traumas, and two participants underwent EMDR treatment for three traumas. (See Appendix 3.2 Number of sessions of EMDR treatment per trauma for each participant.)

All 32 participants completed the full EMDR protocol treatment for the treatment of one trauma. The mean number of sessions to reduce the subjective unit of disturbance of the first trauma treated using EMDR was 7.66 sessions. Twenty one participants were involved in a life threatening experience and the mean number of sessions to reduce the subjective unit of disturbance for the first trauma treated was 7.62 sessions. Eight participants witnessed a life threatening event and the mean number of sessions to reduce the subjective unit of disturbance to zero for the first trauma was 7.5 sessions. Three participants were not exposed to a life threatening event, and the mean number of sessions to reduce the subjective unit of disturbance for the first trauma was 8.3 sessions.

Thirteen participants completed the full EMDR protocol treatment for a second trauma. The mean number of sessions to reduce the subjective unit of disturbance for the second trauma using EMDR was 6.3 sessions. Seven of these participants were personally involved in a life threatening event and the mean number of session to reduce the subjective unit of disturbance of the second trauma treated using EMDR was 5.7 sessions. Four of these participants witnessed a life threatening event and the mean number of session to reduce the subjective unit of disturbance of the second trauma treated using EMDR was 8.25 sessions. Two of these participants were not exposed to a life threatening event and the mean number of session to reduce the subjective unit of disturbance of the second trauma treated using EMDR was 4.5 sessions.

Two of the participants completed the full EMDR protocol treatment for a third trauma. The mean number of sessions to reduce the subjective unit of disturbance for the third trauma using EMDR was 3 sessions. However, these results can not be generalised to a clinical population because the sample is too small.

5.3 Statistical analysis of the first and second measurement

The first measurement was compiled from the data of the MCMI-III completed before EMDR treatment and the second measurement was compiled from the data of the MCMI-III completed after the treatment of one trauma using EMDR. The statistical analysis of these results will provide evidence of the change and correlation that occurred after the treatment of one trauma using EMDR.

Given the relatively small sample size, and in the context of multiple univariate comparisons, an alpha level of .01 was selected for all univariate comparisons in order to reduce the likelihood of a Type-I error.

5.3.1 Change in clinical personality patterns after treatment of one trauma

The clinical personality patterns under investigation after the treatment of one trauma using EMDR are schizoid, avoidant, dependent, histrionic, narcissistic, antisocial, sadistic (aggressive), compulsive, negativistic (passive-aggressive), and masochistic (self-defeating). The data were derived from the scores on the MCMI-III personality patterns scales.

5.3.1.1 Kolmogorov-Smirnov test

The distribution of the change in clinical personality patterns after the treatment of one trauma using EMDR was analysed. The Kolmogorov-Smirnov test combined with the distribution of each personality pattern and a normal distribution overlay was used to test for normality. Variables not normally distributed were transformed to ensure normality.

Table 2. Transformed variables on clinical personality patterns after the treatment of one trauma.

Personality patterns	Transformation
Schizoid	Squared
Negativistic (Passive-Aggressive)	Squared

5.3.1.2 Paired t-test

A paired t-test was performed on all the clinical personality patterns that were normally distributed to determine if the average change in the personality patterns between the first measurement before EMDR treatment and the measurement after the EMDR treatment of one trauma was significantly different.

Table 3. Paired t-test for significant change in clinical personality patterns after the treatment of one trauma.

Personality patterns	Degrees of Freedom	t-value	p-value
Schizoid	31	2.78	0.0092
Avoidant	31	3.99	0.0004
Dependent	31	4.90	<.0001
Histrionic	31	-2.66	0.0122
Narcissistic	31	-3.56	0.0012
Antisocial	31	2.53	0.0169
Sadistic (Aggressive)	31	2.88	0.0071
Compulsive	31	-3.66	0.0009
Negativistic (Passive-Aggressive)	31	3.87	0.0005
Masochistic (Self-Defeating)	31	4.66	<.0001

The null hypothesis states that EMDR treatment does not lead to significant changes in MCMI-III scores for clinical personality patterns, schizoid, avoidant, dependent, histrionic, narcissistic, antisocial, sadistic, compulsive, negativistic and masochistic, after the EMDR treatment of one trauma.

The null hypothesis was rejected for clinical personality patterns, schizoid, avoidant, dependent, narcissistic, sadistic, compulsive, negativistic and masochistic, after the EMDR treatment of one trauma. This means that EMDR treatment did lead to significant changes in MCMI-III scores for clinical personality patterns, schizoid, avoidant, dependent, narcissistic, sadistic, compulsive, negativistic and masochistic, after the EMDR treatment of one trauma.

Although the null hypothesis could not be rejected for histrionic and antisocial personality patterns at the .01 level, the obtained t-value for these personality patterns was tending towards significance (i.e., $p < .05$).

EMDR treatment did significantly reduce the MCMI-III scores for schizoid, avoidant, dependent, sadistic, negativistic and masochistic clinical personality patterns. However, EMDR also significantly increased the MCMI-III scores for narcissistic and compulsive clinical personality patterns, after the treatment of one trauma.

On the MCMI-III, an elevated score on the histrionic, compulsive and narcissistic personality scale is rarely correlated with a psychiatric condition and is often positively correlated with emotional health and healthy adaptive personality styles, as similar results are seen in training air force pilots (Craig, 2008). Therefore, increases in compulsive, histrionic and narcissistic personality patterns with EMDR treatment suggests that EMDR treatment is effective in reducing disturbance and increasing psychological health. However, this would need to be validated by a larger sample.

5.3.2 Change in severe personality patterns after the treatment of one trauma

Even though no participants in this research study had clinically significant schizotypal, borderline and paranoid severe personality patterns, they did complete these scales on the MCMI-III. The severe personality patterns; schizotypal, borderline and paranoid, were measured after the treatment of one trauma using EMDR and the data were analysed.

5.3.2.1 Kolmogorov-Smirnov test

The distribution of the change in the severe personality patterns after the treatment of one trauma using EMDR was analysed. The Kolmogorov-Smirnov test combined with the distribution of each severe personality pattern and a normal distribution overlay was used to test for normality. Variables not normality distributed were transformed to ensure normality.

Table 4. Transformed variables on severe personality patterns after the treatment of one trauma

Severe personality pattern	Transformation
Schizotypal	Cubic

5.3.2.2 Paired t-test

A paired t-test was performed on the severe personality patterns that were normally distributed to determine if the average change after the treatment of one trauma using EMDR was significantly different.

Table 5. Paired t-test for significant change in severe personality patterns after the treatment of one trauma

Severe personality patterns	Degrees of Freedom	t-value	p-value
Schizotypal	31	5.58	<.0001
Borderline	31	4.84	<.0001
Paranoid	31	3.66	0.0009

The null hypothesis states that EMDR treatment does not lead to significant changes in MCMI-III scores for severe personality patterns, borderline, schizotypal, and paranoid, after the treatment of the first trauma.

The null hypothesis was rejected for severe personality patterns, borderline, schizotypal, and paranoid, after the treatment of the first trauma. This means that EMDR treatment did lead to significant changes in MCMI-III scores for severe personality patterns, borderline, schizotypal, and paranoid, after the EMDR treatment of one trauma.

EMDR did significantly reduce the MCMI scores for severe personality patterns, borderline, schizotypal, and paranoid, after the treatment of one trauma using EMDR.

5.3.3 Change in depressive constructs after treatment of one trauma

The depressive constructs under investigation after the treatment of one trauma using EMDR were major depression, dysthymia and depressive personality pattern. These were measured using the MCMI-III scales.

5.3.3.1 Kolmogorov-Smirnov test

The distribution of the change in depressive constructs after the treatment of one trauma using EMDR was analysed. The Kolmogorov-Smirnov test combined with the distribution of each depressive construct and a normal distribution overlay was used to test for normality. Variables not normally distributed were transformed to ensure normality.

Table 6. Transformed variables on depressive constructs after the treatment of one trauma.

Depressive construct	Transformation
Depressive personality	Squared

5.3.3.2 Paired t-test

A paired t-test was performed on the depressive constructs that were normally distributed (all except dysthymia) to determine if the average change in the depressive constructs after the treatment of one trauma using EMDR was significantly different.

Table 7. Paired t-test for significant change in depressive constructs after the treatment of one trauma.

Depressive constructs	Degrees of Freedom	t-value	p-value
Major Depression	31	5.93	<.0001
Depressive Personality	31	4.56	<.0001

The depressive constructs, major depression and depressive personality pattern, showed a significant change in symptoms after the treatment of one trauma using EMDR.

However, the dysthymia clinical scale could not be successfully transformed into a normal distribution and a non-parametric test, the ranked sign test was used to test for a significant difference after treatment.

Table 8. Non-parametric ranked sign test for significant change in dysthymia after the treatment of one trauma.

Depressive construct	p-value
Dysthymia	<.0001

There was also a significant reduction in symptoms of dysthymia after EMDR treatment of one trauma.

The null hypothesis states that EMDR treatment does not lead to significant changes in MCMI-III scores for depressive constructs, major depression, dysthymia and depressive personality, after the treatment of one trauma.

The null hypothesis was rejected for depressive constructs, major depression, dysthymia and depressive personality, after the treatment of the first trauma. This means that EMDR treatment did lead to significant changes in MCMI-III scores for depressive constructs, major depression, dysthymia and depressive personality, after the EMDR treatment of one trauma.

EMDR did significantly reduce the MCMI scores for depressive constructs, major depression, dysthymia and depressive personality, after the treatment of one trauma using EMDR.

5.3.4 Change in other clinical syndromes after treatment of one trauma

The other clinical syndromes under investigation after the treatment of one trauma using EMDR are post traumatic stress disorder and anxiety disorder. These were measured using the MCMI-III clinical syndrome scales.

5.3.4.1 Kolmogorov-Smirnov test

The distribution of the change in other clinical syndromes after the treatment of one trauma using EMDR was analysed. The Kolmogorov-Smirnov test combined with the distribution of each clinical syndrome and a normal distribution overlay was used to test for normality. Variables not normality distributed were transformed to ensure normality.

Table 9. Transformed variables in other clinical syndromes after treatment of one trauma.

Clinical syndromes	Transformation
Post Traumatic Stress Disorder	Squared

5.3.4.2 Paired t-test

A paired t-test was performed on other clinical syndromes that were normally distributed to determine if the average change in the clinical syndromes after the treatment of one trauma using EMDR was significantly different.

Table 10. Paired t-test for significant change in other clinical syndromes after the treatment of one trauma.

Clinical syndromes	Degrees of Freedom	t-value	p-value
Post Traumatic Stress	31	4.04	0.0003
Anxiety Disorder	31	6.35	<.0001

The null hypothesis states that EMDR treatment does not lead to significant changes in MCMI-III scores for other clinical syndromes, post traumatic stress and anxiety, after the treatment of one trauma.

The null hypothesis was rejected for other clinical syndromes, post traumatic stress and anxiety, after the treatment of one trauma. This means that EMDR treatment did lead to significant changes in MCMI-III scores for other clinical syndromes, post traumatic stress and anxiety, after the EMDR treatment of one trauma.

EMDR did significantly reduce the MCMI scores for other clinical syndromes, post traumatic stress and anxiety, after the treatment of one trauma using EMDR.

5.3.5 Change in severe clinical syndromes after treatment of one trauma

Even though no participants in this research study had clinically significant bipolar (manic) disorder, thought disorder, delusional disorder, and alcohol and drug dependence before EMDR treatment, they did complete these scales on the MCMI-III. The severe clinical syndromes (bipolar disorder, thought disorder, delusional disorder, and alcohol and drug dependence) were measured after the treatment of one trauma using EMDR treatment.

5.3.5.1 Kolmogorov-Smirnov test

The distribution of the change in the severe clinical syndromes after the treatment of one trauma using EMDR was analysed. The Kolmogorov-Smirnov test combined with the distribution of each severe clinical syndrome and a normal distribution overlay was used to test for normality. Variables not normality distributed were transformed to ensure normality.

Table 11. Transformed variables on severe clinical syndromes after the treatment of one trauma

Severe clinical syndromes	Transformation
Thought disorder	Cubic
Delusional disorder	Square root
Alcohol dependence	Squared

5.3.5.2 Paired t-test

A paired t-test was performed on the severe clinical syndromes that were normally distributed to determine if the average change after the treatment of one trauma using EMDR was significantly different.

There was a significant decrease in symptoms for thought disorder, delusional disorder and alcohol dependence after treatment of one trauma using EMDR. However, there was no significant change on the bipolar (manic) disorder and drug dependence MCMI-III scales.

Table 12. Paired t-test for significant change in severe clinical syndromes after the treatment of one trauma

Severe clinical syndromes	Degrees of Freedom	t-value	p-value
Bipolar (manic)	31	1.21	0.2371
Thought disorder	31	6.15	<.0001
Delusional disorder	31	3.18	0.0034
Alcohol dependence	31	3.23	0.0029
Drug dependence	31	0.78	0.4394

The null hypothesis states that EMDR treatment does not lead to significant changes in MCMI-III scores for severe clinical syndromes, bipolar, thought disorder, delusional disorder, and alcohol and drug dependence, after the treatment of one trauma.

The null hypothesis was rejected for severe clinical syndromes, thought disorder, delusional disorder and alcohol dependence, after the treatment of the first trauma. This means that EMDR treatment did lead to significant changes in MCMI-III scores for severe clinical syndromes, thought disorder, delusional disorder and alcohol dependence, after the EMDR treatment of one trauma.

The null hypothesis was not rejected for severe clinical syndromes, bipolar and drug dependence, after the treatment of the first trauma. This means that EMDR treatment did not lead to significant changes in MCMI-III scores for bipolar and drug dependence after the EMDR treatment of one trauma.

EMDR did significantly reduce the MCMI-III scores for severe clinical syndromes, thought disorder, delusional disorder and alcohol dependence after the treatment of one trauma using EMDR. However, EMDR did not significantly reduce the MCMI-III scores for bipolar and drug dependence after the treatment of one trauma using EMDR

5.3.6 Change in dissociation after the treatment of one trauma

The Dissociative Experience Scale II (DES-II) was used to collect data for the measurement of dissociation. The first measurement was taken before EMDR treatment and the second measurement was taken after the treatment of one trauma using EMDR.

5.3.6.1 Paired t-test

A paired t-test was performed on dissociation to determine if the average change in dissociation after the treatment of one trauma using EMDR was significantly different.

Table 13. Paired t-test for significant change in dissociation after the treatment of one trauma.

	Degrees of Freedom	t-value	p-value
Dissociation	31	5.26	<.0001

The analysis shows that there was a significant change in dissociation after the treatment of one trauma using EMDR.

The null hypothesis states that EMDR treatment does not lead to significant changes in DES-II scores for dissociation after the treatment of one trauma.

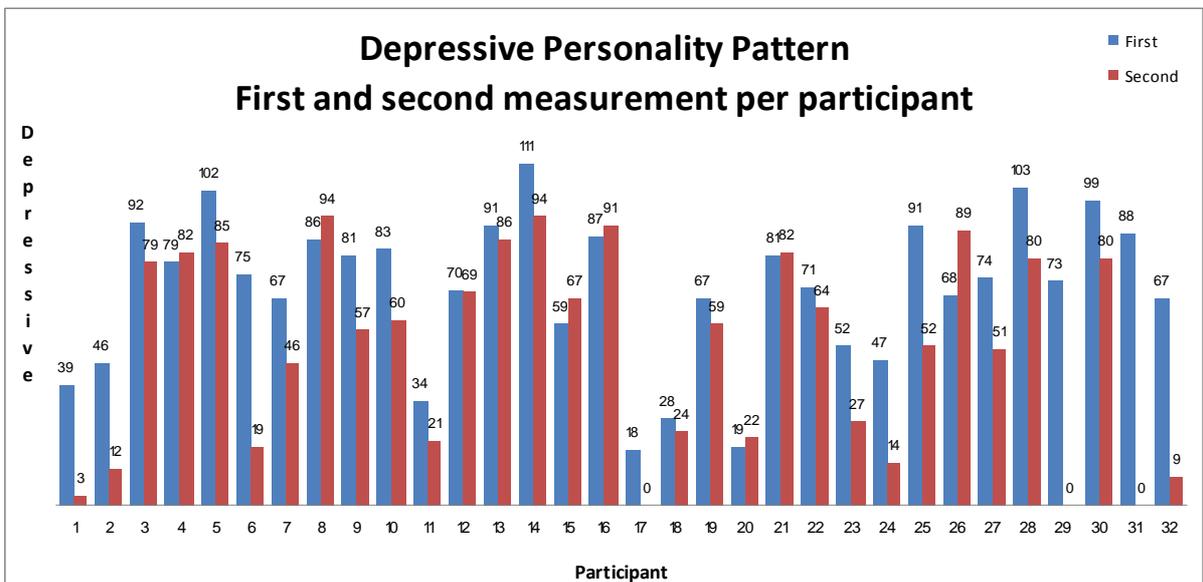
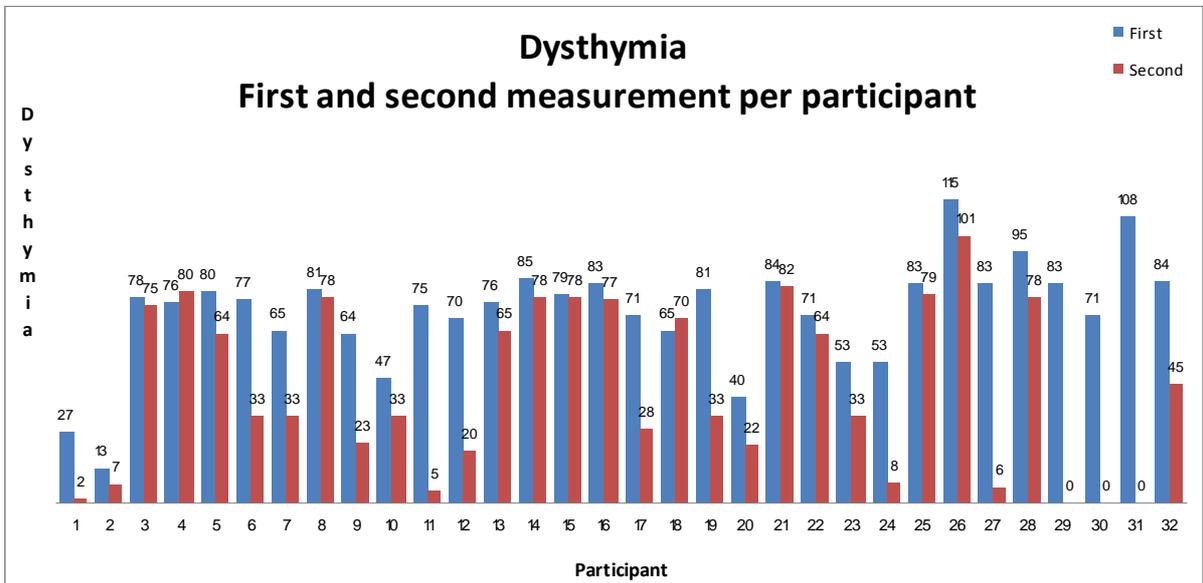
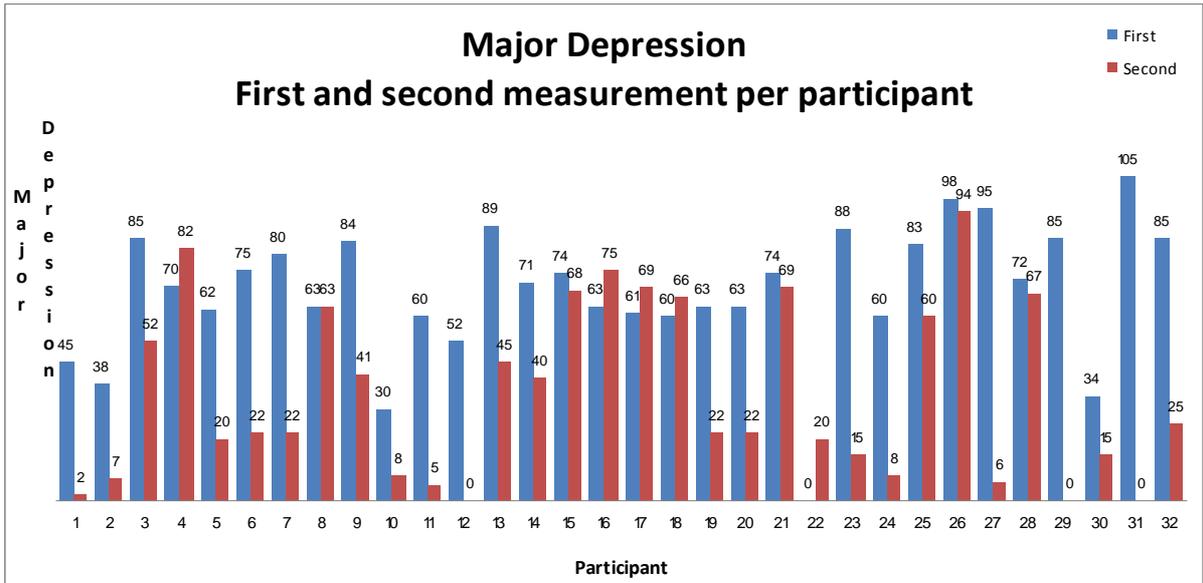
The null hypothesis was rejected for dissociation after the EMDR treatment of one trauma. This means that EMDR treatment did lead to significant changes in DES-II scores for dissociation, after the EMDR treatment of one trauma.

5.3.7 Association between depressive constructs after treatment of one trauma

The association between the depressive constructs was analysed after the treatment of one trauma using EMDR. The depressive constructs under investigation in this study were major depression, dysthymia and depressive personality pattern.

5.3.7.1 Plots for depressive constructs

Plots were performed to depict the scores obtained on the MCMI-III depressive scales; major depression, dysthymia and depressive personality pattern. The plots represent the scores obtained before the EMDR treatment (represented in blue) versus the scores obtained after the treatment of one trauma using EMDR (represented in red).



5.3.7.2 Spearman rank correlation analysis

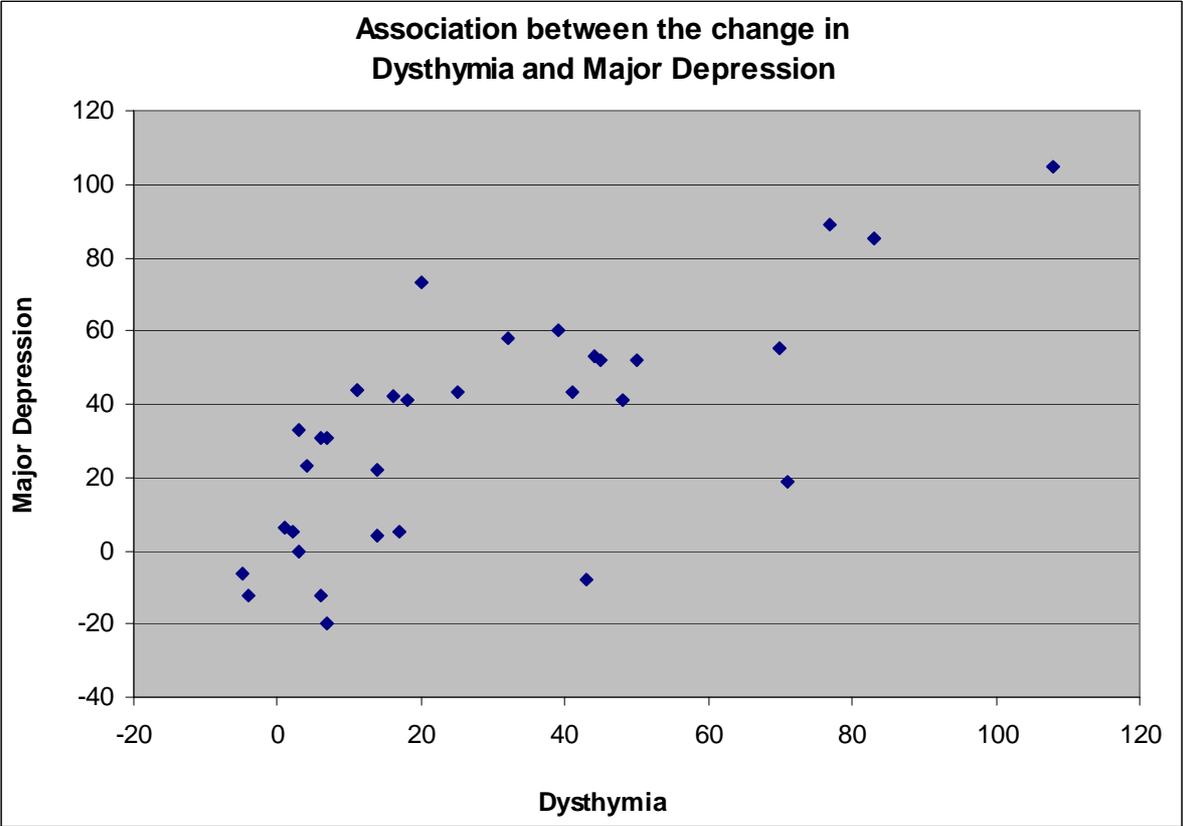
The correlation between depressive constructs, major depression, dysthymia, and depressive personality pattern, was tested by using the Spearman rank correlation coefficient and the associated p-value.

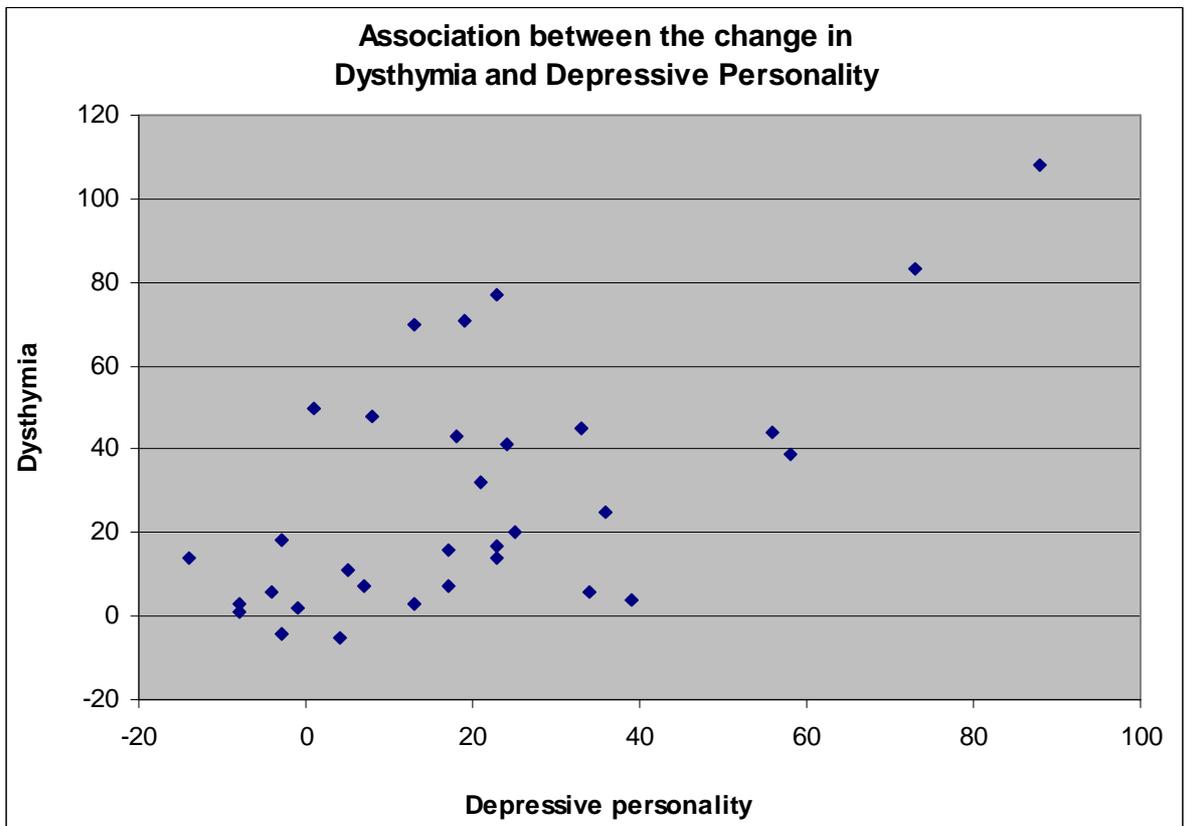
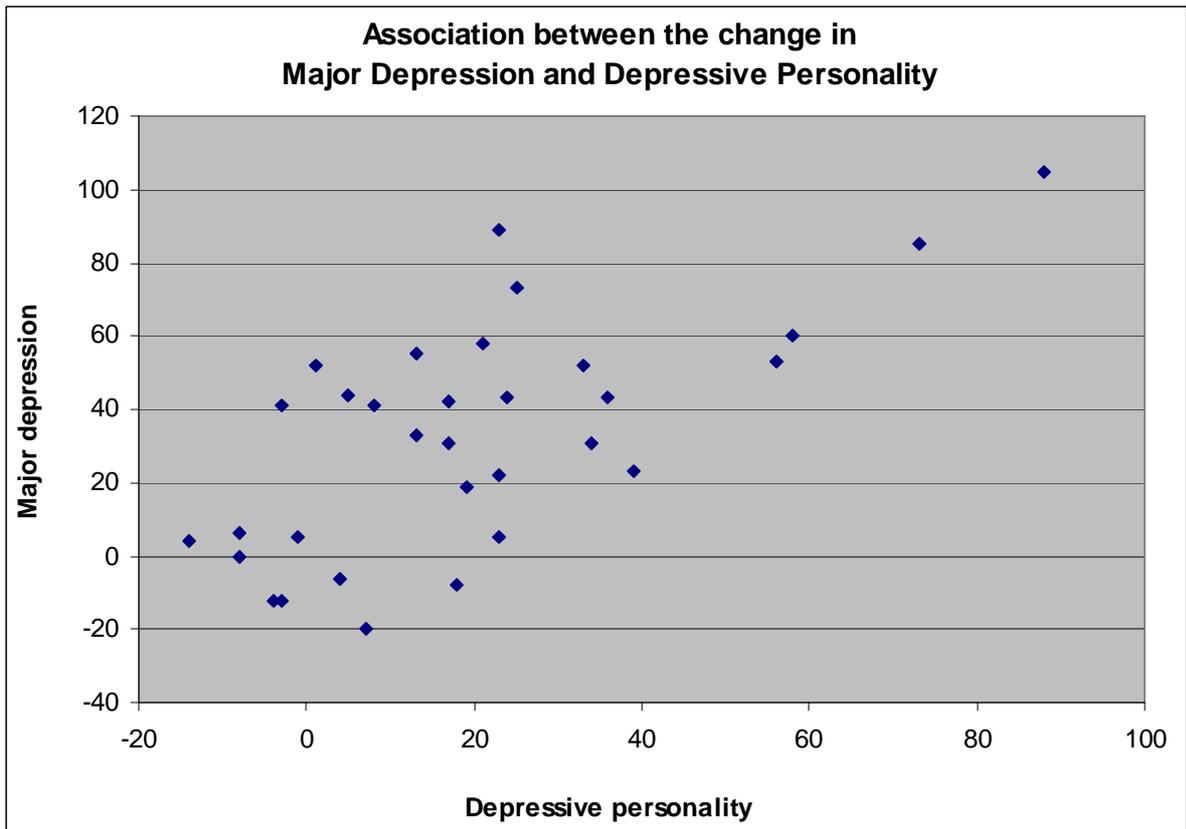
Table 14. Analysis of correlation of depressive constructs after treatment of one trauma

Depressive constructs	Statistic	Dysthymia	Major depression	Depressive personality
Dysthymia	Spearman correlation coefficient	1.0000	0.70106	0.53422
	p-value		<.0001	0.0016
Major depression	Spearman correlation coefficient	0.70106	1.0000	0.62534
	p-value	<.0001		0.0001
Depressive personality	Spearman correlation coefficient	0.53422	0.62534	1.000
	p-value	0.0016	0.0001	

The correlation coefficient is a number that represents the nature of the relationship between two variables. Positive correlation means that high values in one variable tend to be associated with high values on the other variable, and low values on one variable tend to be associated with low values on the other variable. The size of the correlation coefficient determines the strength of the relationship between the two variables. Possible values of the correlation coefficients range from -1.00 through to +1.00. The larger the size of the correlation coefficient (in absolute value), the stronger the relationship between the two variables.

There is a significant positive correlation between the change in dysthymia and major depression (correlation coefficient 0.70106), major depression and depressive personality (correlation coefficient 0.62534), and dysthymia and depressive personality (correlation coefficient 0.53422) after the treatment of one trauma using EMDR. The size of the correlation coefficients shows that the correlation is only moderately strong, with the strongest correlation between dysthymia and major depression.





5.3.8 Association between depressive constructs and other clinical syndromes after the treatment of one trauma

The association between the depressive constructs, major depression and dysthymia, and other clinical syndromes, post traumatic stress and anxiety, was analysed after the treatment of one trauma using EMDR.

5.3.8.1 Spearman rank correlation analysis

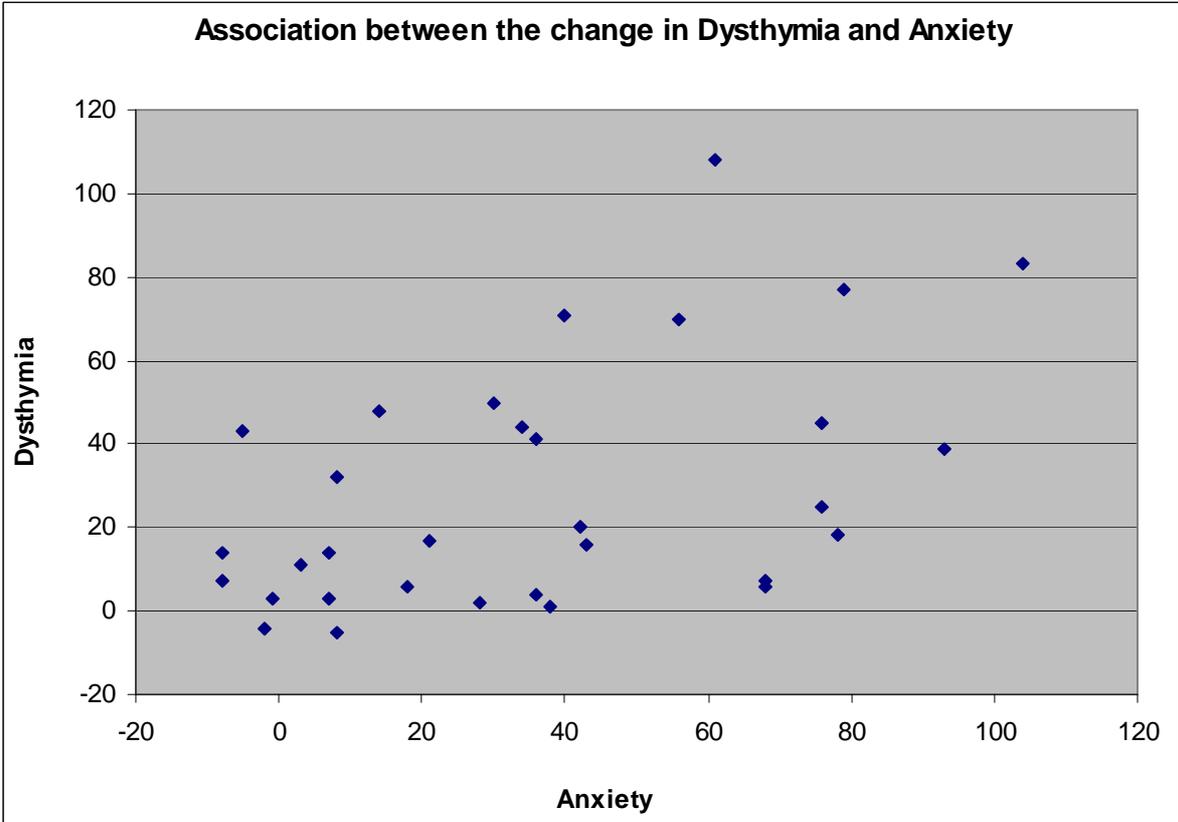
The correlation between depressive constructs and other clinical syndromes was tested by using the Spearman rank correlation coefficient and the associated p-value.

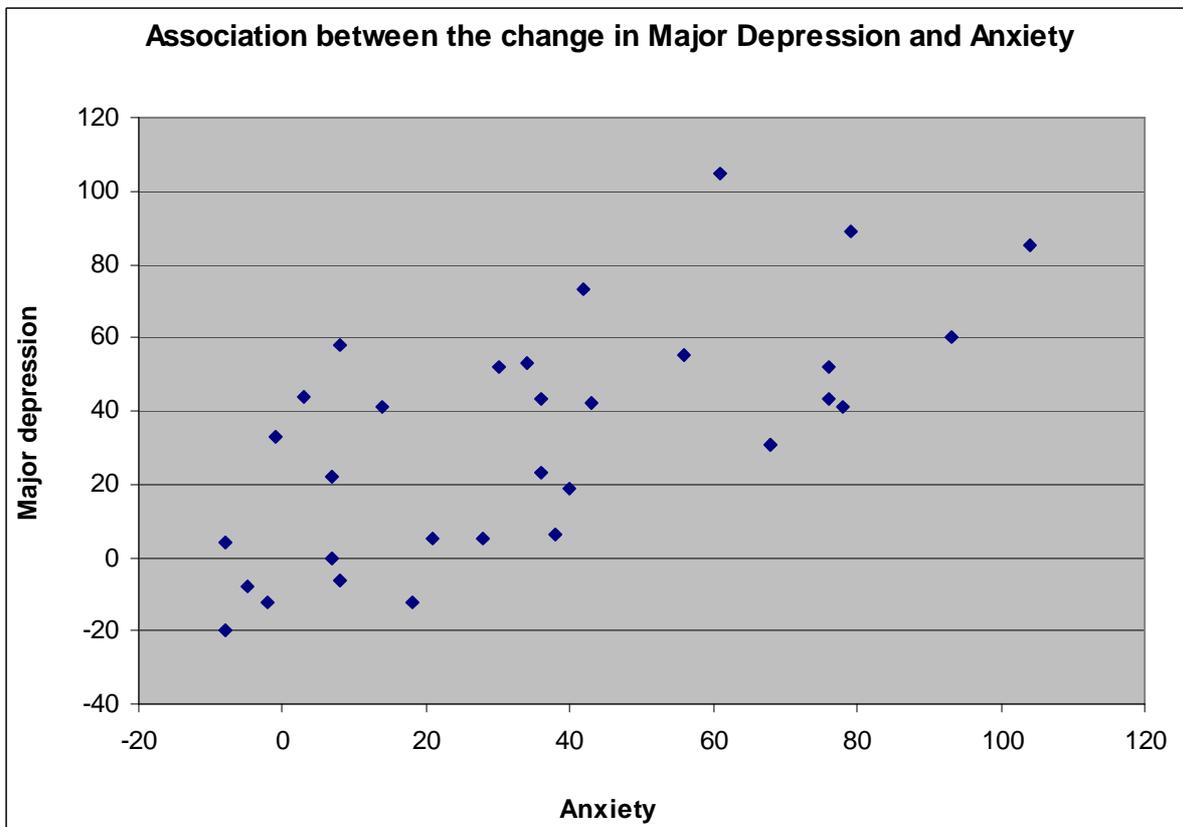
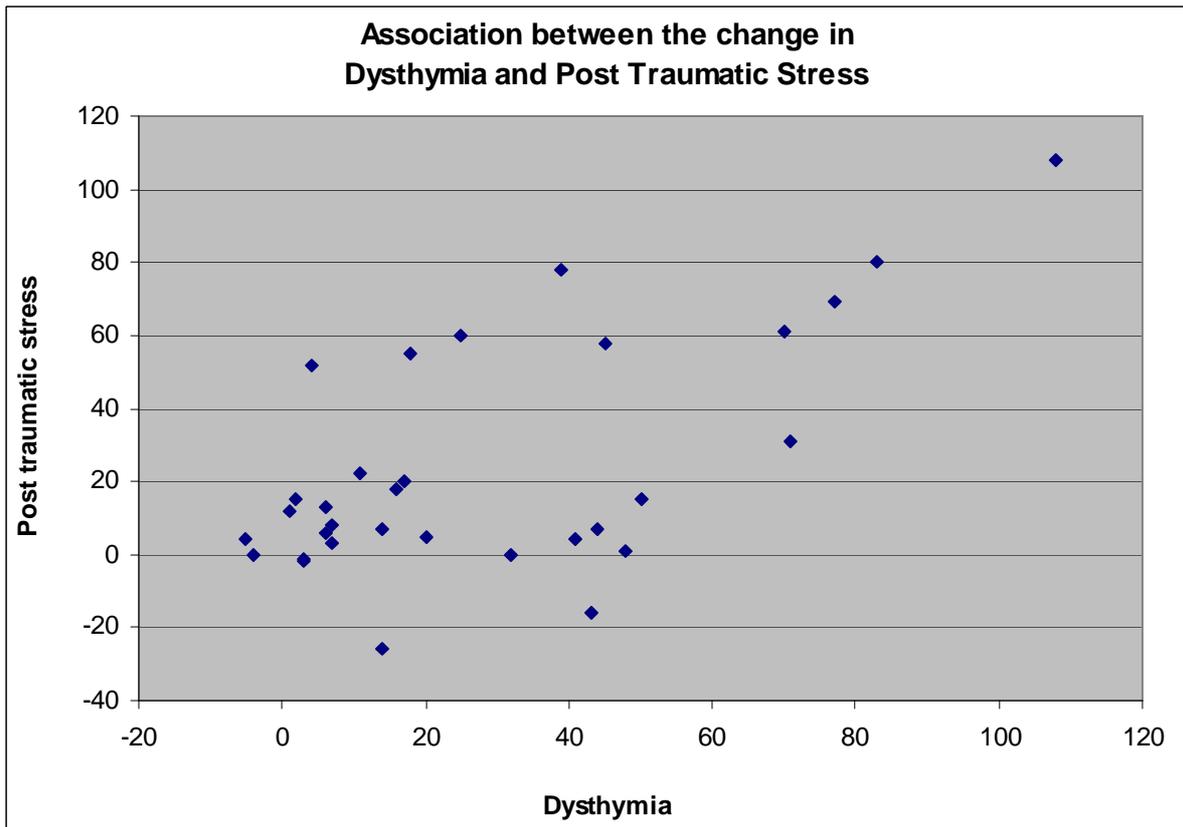
Table 15. Analysis of correlation between depressive constructs and clinical syndromes after treatment of one trauma

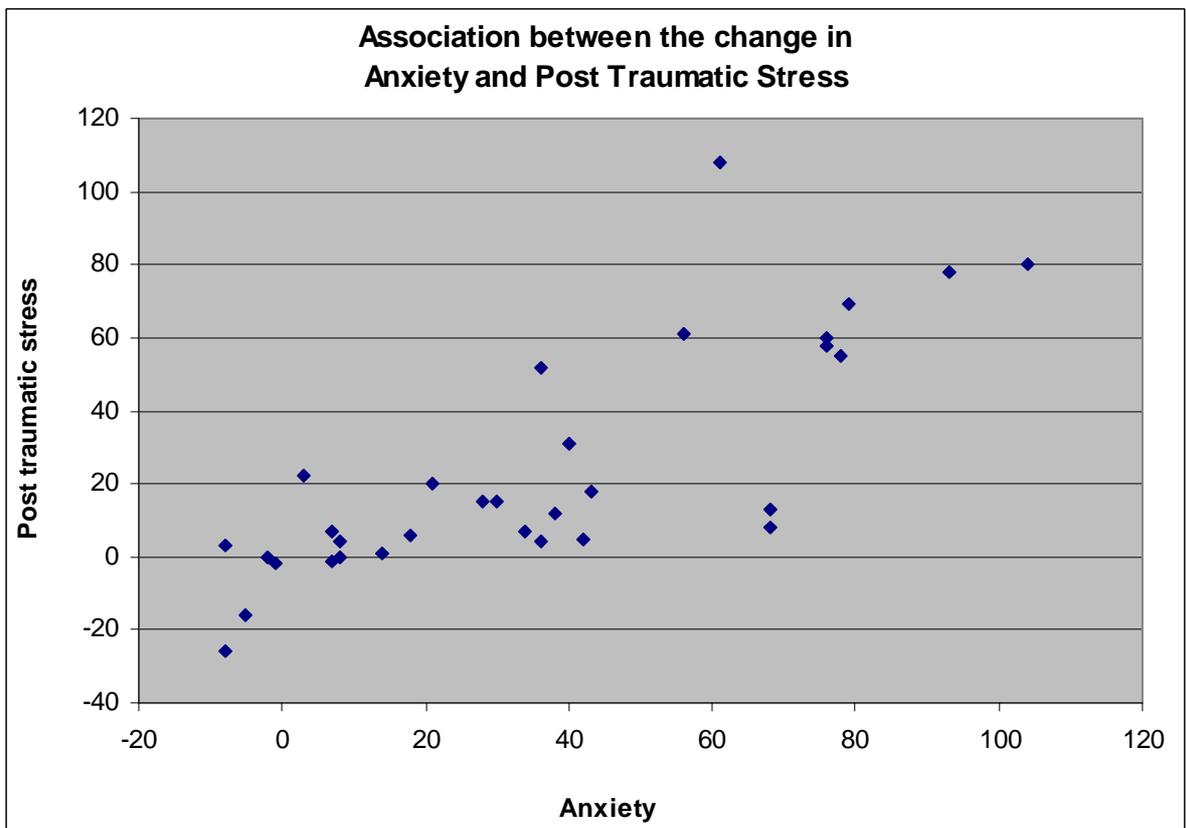
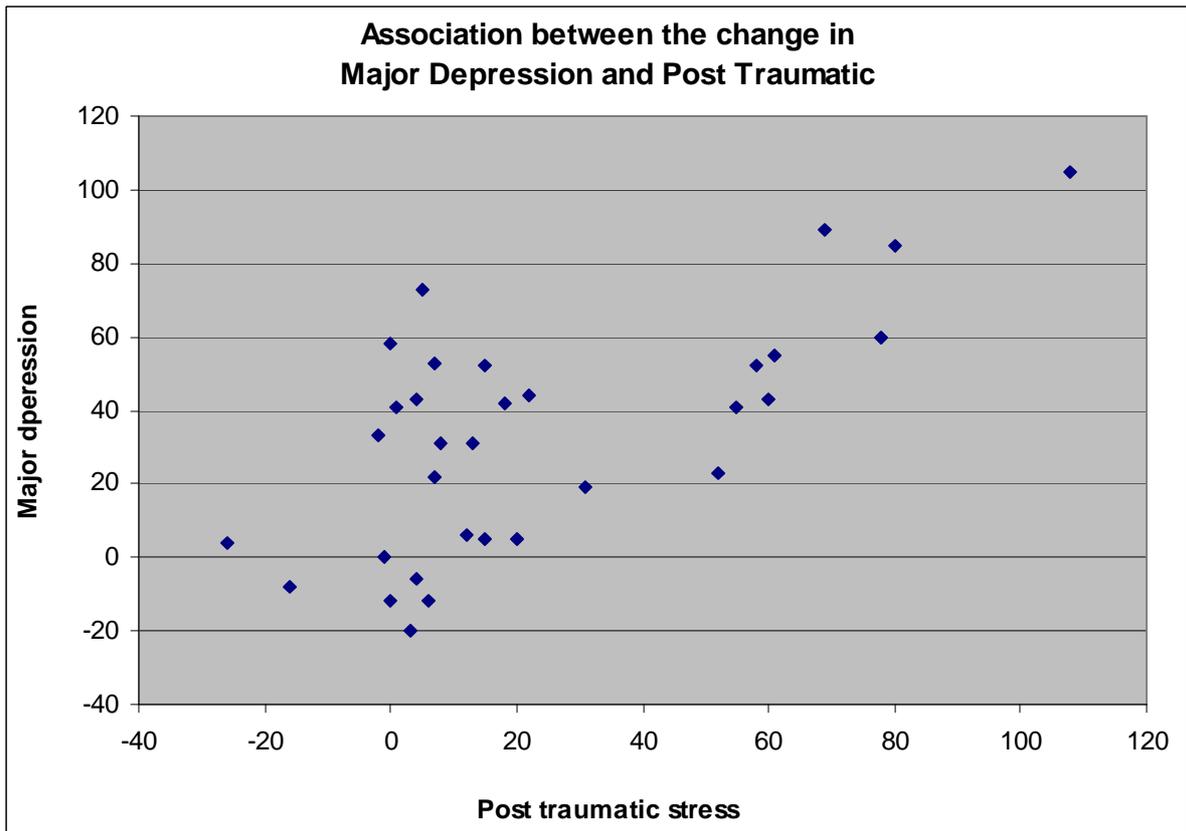
Clinical constructs	Statistic	Anxiety	Dysthymia	Post traumatic stress	Major depression
Anxiety disorder	Spearman correlation coefficient	1.0000	0.46909	0.81471	0.65385
	p-value		0.0068	<.0001	<.0001
Dysthymia	Spearman correlation coefficient	0.46909	1.0000	0.48175	0.70106
	p-value	0.0068		0.0052	<.0001
Post traumatic stress	Spearman correlation coefficient	0.81471	0.48175	1.0000	0.58888
	p-value	<.0001	0.0052		0.0004
Major depression	Spearman correlation coefficient	0.65385	0.70106	0.58888	1.0000
	p-value	<.0001	<.0001	0.0004	

There is a significant positive correlation between the change in anxiety and post traumatic stress (correlation coefficient 0.81471), dysthymia and major depression (correlation coefficient 0.70106), anxiety and major depression (correlation coefficient 0.65385), post traumatic stress and major depression (correlation coefficient 0.58888), dysthymia and post traumatic stress (correlation coefficient 0.48175), and anxiety and dysthymia (correlation coefficient 0.46909).

The correlation between anxiety disorder and post traumatic stress (correlation coefficient 0.81471) is a strong correlation. There is moderate correlation between dysthymia and major depression, anxiety and major depression, post traumatic stress and major depression. Although the correlation is significant, weak correlations exist between dysthymia and post traumatic stress, and anxiety and dysthymia.







5.4 Statistical analysis of the first and last measurement

The first measurement was compiled from the data of the MCMI-III completed before EMDR treatment and the last measurement was compiled from the data of the MCMI-III completed at the end of EMDR treatment. For some participants, the last measurement will be after the treatment of one trauma while for other participants it would be after the treatment of two or three traumas. The statistical analysis of these results will provide evidence of the change and correlation that occurred after multiple traumas were treated using EMDR.

Given the relatively small sample size, and in the context of multiple univariate comparisons, an alpha level of .01 was selected for all univariate comparisons in order to reduce the likelihood of a Type-I error.

5.4.1 Change in clinical personality patterns between the first and last measurement

The clinical personality patterns on the MCMI-III under investigation between the first measurement before EMDR treatment and the last measurement at the end of EMDR treatment are schizoid, avoidant, dependent, histrionic, narcissistic, antisocial, sadistic (aggressive), compulsive, negativistic (passive-aggressive), and masochistic (self-defeating).

5.4.1.1 Kolmogorov-Smirnov test

The distribution of the change in clinical personality patterns between the first measurement before EMDR treatment and the measurement at the end of EMDR treatment was analysed. The Kolmogorov-Smirnov test combined with the distribution of each personality pattern and a normal distribution overlay was used to test for normality.

5.4.1.2 Paired t-test

A paired t-test was performed on all the clinical personality patterns that were normally distributed to determine if the average change in the clinical personality patterns between the first measurement before EMDR treatment and the last measurement at the end of EMDR treatment was significantly different.

Table 16. Paired t-test for significant change in clinical personality patterns between the first and last measurement

Personality patterns	Degrees of Freedom	t-value	p-value
Schizoid	31	3.94	0.0004
Avoidant	31	4.79	<.0001
Dependent	31	7.97	<.0001
Histrionic	31	-5.54	<.0001
Narcissistic	31	-5.84	<.0001
Antisocial	31	2.62	0.0134
Sadistic (Aggressive)	31	4.44	0.0001
Compulsive	31	-3.32	0.0023
Negativistic (Passive-Aggressive)	31	6.26	<.0001
Masochistic (Self-Defeating)	31	7.12	<.0001

The null hypothesis states that EMDR treatment does not lead to significant changes in MCMI-III scores for clinical personality patterns, schizoid, avoidant, dependent, histrionic, narcissistic, antisocial, sadistic, compulsive, negativistic and masochistic, between the first measurement before EMDR treatment and the last measurement at the end of the EMDR treatment.

The null hypothesis was rejected for clinical personality patterns, schizoid, avoidant, dependent, histrionic, narcissistic, sadistic, compulsive, negativistic, and masochistic, between the first measurement before EMDR treatment and the last measurement at the end of the EMDR treatment. This means that EMDR treatment did lead to significant changes in MCMI-III scores for clinical personality patterns, schizoid, avoidant, dependent, histrionic, narcissistic, sadistic, compulsive, negativistic, and masochistic, between the first measurement before EMDR treatment and the last measurement at the end of the EMDR treatment.

Although the null hypothesis could not be rejected for antisocial personality pattern at the .01 level, the obtained t-value for these personality patterns was tending towards significance (i.e., $p < .05$).

EMDR did significantly reduce the MCMI scores for clinical personality patterns, schizoid, avoidant, dependent, sadistic, negativistic and masochistic, but EMDR also significantly increased the MCMI-III scores for histrionic, narcissistic and compulsive personality patterns, between the first measurement before EMDR treatment and the last measurement at the end of the EMDR treatment.

On the MCMI-III a significant score on the histrionic, compulsive and narcissistic scale is rarely correlated with a psychiatric condition and is often positively correlated with psychological health and adaptive personality styles (Craig, 2008). Therefore, elevated scores on the compulsive, histrionic and narcissistic personality patterns with EMDR treatment suggests that EMDR may be effective in reducing disturbance and increasing emotional health. However, this would need to be validated by a larger sample.

5.4.2 Change in severe personality patterns between the first and last measurement

The severe personality patterns on the MCMI-III, schizotypal, borderline and paranoid, were also measured before EMDR treatment and at the end of the EMDR treatment.

5.4.2.1 Kolmogorov-Smirnov test

The distribution of the change in the severe personality patterns, schizotypal, borderline and paranoid, between the first measurement before EMDR treatment and the last measurement at end of the EMDR treatment was analysed. The Kolmogorov-Smirnov test combined with the distribution of each severe personality pattern and a normal distribution overlay was used to test for normality. Variables not normality distributed were transformed to ensure normality.

Table 17. Transformed variables on severe personality patterns between the first and last measurement

Severe personality pattern	Transformation
Schizotypal	Square root

5.4.2.2 Paired t-test

A paired t-test was performed on the severe personality patterns that were normally distributed to determine if the average change between the first measurement before EMDR treatment and the last measurement at the end of EMDR treatment was significantly different.

Table 18. Paired t-test for significant change in severe personality patterns between the first and last measurement

Severe personality patterns	Degrees of Freedom	t-value	p-value
Schizotypal	31	6.08	<.0001
Borderline	31	6.86	<.0001
Paranoid	31	4.87	<.0001

The null hypothesis states that EMDR treatment does not lead to significant changes in MCMI-III scores for severe personality patterns, borderline, schizotypal, and paranoid, between the first measurement before EMDR treatment and the last measurement at the end of EMDR treatment.

The null hypothesis was rejected for severe personality patterns, borderline, schizotypal, and paranoid, between the first measurement before EMDR treatment and the last measurement at the end of EMDR treatment.

This means that EMDR treatment did lead to significant changes in MCMI-III scores for severe personality patterns, borderline, schizotypal, and paranoid, between the first measurement before EMDR treatment and the last measurement at the end of EMDR treatment.

EMDR did significantly reduce the MCMI scores for severe personality patterns, borderline, schizotypal, and paranoid, between the first measurement before EMDR treatment and the last measurement at the end of EMDR treatment.

5.4.3 Change in depressive constructs between the first and last measurement

The depressive constructs on the MCMI-III under investigation between the first measurement before EMDR treatment and the last measurement at the end of EMDR treatment are major depression, dysthymia and depressive personality.

5.4.3.1 Kolmogorov-Smirnov test

The distribution of the change in depressive constructs between the first measurement before EMDR treatment and the last measurement at the end of the EMDR was analysed. The Kolmogorov-Smirnov test combined with the distribution of each depressive construct and a normal distribution overlay was used to test for normality. Variables not normally distributed were transformed to ensure normality.

Table 19. Transformed variables in depressive constructs between the first and last measurement

Depressive construct	Transformation
Depressive Personality	Squared

5.4.3.2 Paired t-test

A paired t-test was performed on the depressive constructs, major depression, dysthymia and depressive personality pattern, that were normally distributed to determine if the average change between the first measurement before EMDR treatment and the last measurement at the end of EMDR treatment was significantly different.

Table 20. Paired t-test for significant change in depressive constructs between the first and last measurement

Depressive constructs	Degrees of Freedom	t-value	p-value
Major Depression	31	7.49	<.0001
Dysthymia	31	7.43	<.0001
Depressive Personality	31	6.42	<.0001

The null hypothesis states that EMDR treatment does not lead to significant changes in MCMI-III scores for depressive constructs, major depression, dysthymia and depressive personality, between the first measurement before EMDR treatment and the last measurement at the end of EMDR treatment.

The null hypothesis was rejected for the depressive constructs, major depression, dysthymia and depressive personality, between the first measurement before EMDR treatment and the last measurement at the end of EMDR treatment.

This means that EMDR treatment did lead to significant changes in MCMI-III scores for the depressive constructs, major depression, dysthymia and depressive personality, between the first measurement before EMDR treatment and the last measurement at the end of EMDR treatment.

EMDR did significantly reduce the MCMI scores for depressive constructs, major depression, dysthymia and depressive personality, between the first measurement before EMDR treatment and the last measurement at the end of EMDR treatment.

5.4.4 Change in other clinical syndromes between the first and last measurement

The clinical syndromes on the MCMI-III under investigation between the first measurement before EMDR treatment and the last measurement at the end of EMDR treatment are post traumatic stress and anxiety.

5.4.4.1 Kolmogorov-Smirnov test

The distribution of the change in other clinical syndromes, post traumatic stress and anxiety, between the first measurement before EMDR treatment and the last measurement at the end of the EMDR was analysed. The Kolmogorov-Smirnov test combined with the distribution of each clinical syndrome and a normal distribution overlay was used to test for normality. Variables not normally distributed were transformed to ensure normality.

Table 21. Transformed variables in other clinical syndromes between the first and last measurement

Clinical Syndromes	Transformation
Anxiety Disorder	Squared
Post Traumatic Stress Disorder	Squared

5.4.4.2 Paired t-test

A paired t-test was performed on other clinical syndromes, post traumatic stress and anxiety, that were normally distributed to determine if the average change between the first measurement before EMDR treatment and the last measurement at the end of EMDR treatment was significantly different.

Table 22. Paired t-test for significant change in other clinical syndromes between the first and last measurement

Clinical syndromes	Degrees of Freedom	t-value	p-value
Anxiety Disorder	31	11.05	<.0001
Post Traumatic Stress Disorder	31	7.85	<.0001

The null hypothesis states that EMDR treatment does not lead to significant changes in MCMI-III scores for other clinical syndromes, post traumatic stress and anxiety, between the first measurement before EMDR treatment and the last measurement at the end of EMDR treatment.

The null hypothesis was rejected for other clinical syndromes, post traumatic stress and anxiety, after the treatment of the first trauma. This means that EMDR treatment did lead to significant changes in MCMI-III scores for other clinical syndromes, post traumatic stress and anxiety, between the first measurement before EMDR treatment and the last measurement at the end of EMDR treatment.

EMDR did significantly reduce the MCMI-III scores for other clinical syndromes, post traumatic stress and anxiety, between the first measurement before EMDR treatment and the last measurement at the end of EMDR treatment.

5.4.5 Change in severe clinical syndromes between first and last measurement

Even though no participants in this research study had clinically significant bipolar (manic) disorder, thought disorder, delusional disorder, and alcohol and drug dependence, they did complete these scales on the MCMI-III. The data measured between the first measurement before the EMDR treatment and at the last measurement at end of EMDR treatment was analysed.

5.4.5.1 Kolmogorov-Smirnov test

The distribution of the change in the severe clinical syndromes between the first measurement before the EMDR treatment and at the last measurement at end of EMDR treatment was analysed. The Kolmogorov-Smirnov test combined with the distribution of the severe clinical syndromes and a normal distribution overlay was used to test for normality. Variables not normally distributed were transformed to ensure normality.

Table 23. Transformed variables on severe clinical syndromes between the first and last measurement

Severe clinical syndromes	Transformation
Thought disorder	Cubic
Alcohol dependence	Cubic

5.4.5.2 Paired t-test

A paired t-test was performed on the severe clinical syndromes that were normally distributed to determine if the average change between the first measurement before the EMDR treatment and at the last measurement at end of EMDR treatment was significantly different.

Table 24. Paired t-test for significant change in severe clinical syndromes between the first and last measurement

Severe clinical syndromes	Degrees of Freedom	t-value	p-value
Bipolar (manic)	31	2.02	0.0516
Thought disorder	31	8.40	<.0001
Delusional disorder	31	3.77	0.0007
Alcohol dependence	31	2.30	0.0286
Drug dependence	31	2.27	0.0304

The null hypothesis states that EMDR treatment does not lead to significant changes in MCMI-III scores for severe clinical syndromes, bipolar, thought disorder, delusional disorder, and alcohol and drug dependence, between the first measurement before the EMDR treatment and at the last measurement at end of EMDR treatment.

The null hypothesis was rejected for severe clinical syndromes, thought disorder and delusional disorder, between the first measurement before the EMDR treatment and at the last measurement at end of EMDR treatment. This means that EMDR treatment did lead to significant changes in MCMI-III scores for severe clinical syndromes, thought disorder and delusional disorder, between the first measurement before the EMDR treatment and at the last measurement at end of EMDR treatment.

Although the null hypothesis could not be rejected for alcohol and drug dependence at the .01 level, the obtained t-value for these personality patterns was tending towards significance (i.e., $p < .05$).

The null hypothesis was not rejected for severe clinical syndrome, bipolar disorder, between the first measurement before the EMDR treatment and at the last measurement at end of EMDR treatment. This means that EMDR treatment did not lead to significant changes in MCMI-III scores for bipolar disorder between the first measurement before the EMDR treatment and at the last measurement at end of EMDR treatment, although the change in bipolar disorder was only marginally not significant at the .05 level.

EMDR did significantly reduce the MCMI-III scores for severe clinical syndromes, thought disorder and delusional disorder, between the first measurement before the EMDR treatment and at the last measurement at end of EMDR treatment. However, EMDR did not significantly reduce the MCMI-III scores for alcohol dependence, drug dependence and bipolar disorder between the first measurement before the EMDR treatment and at the last measurement at end of EMDR treatment.

5.4.6 Change in dissociation between the first and last measurement

The Dissociative Experience Scale II (DES-II) was used to collect data for measurement. The first measurement was taken before EMDR treatment and the last measurement was taken at the end of the EMDR treatment.

5.4.6.1 Paired t-test

A paired t-test was performed on dissociation to determine if the average change between the first measurement before EMDR treatment and the last measurement at the end of EMDR treatment was significantly different.

Table 25. Paired t-test for significant change in dissociation between the first and last measurement

	Degrees of Freedom	t-value	p-value
Dissociation	31	6.00	<.0001

The analysis shows that there was a significant change in dissociation between the first measurement before EMDR treatment and the last measurement at the end of EMDR treatment.

The null hypothesis states that EMDR treatment does not lead to significant change in the DES-II scores for dissociation between the first measurement before EMDR treatment and the last measurement at the end of EMDR treatment.

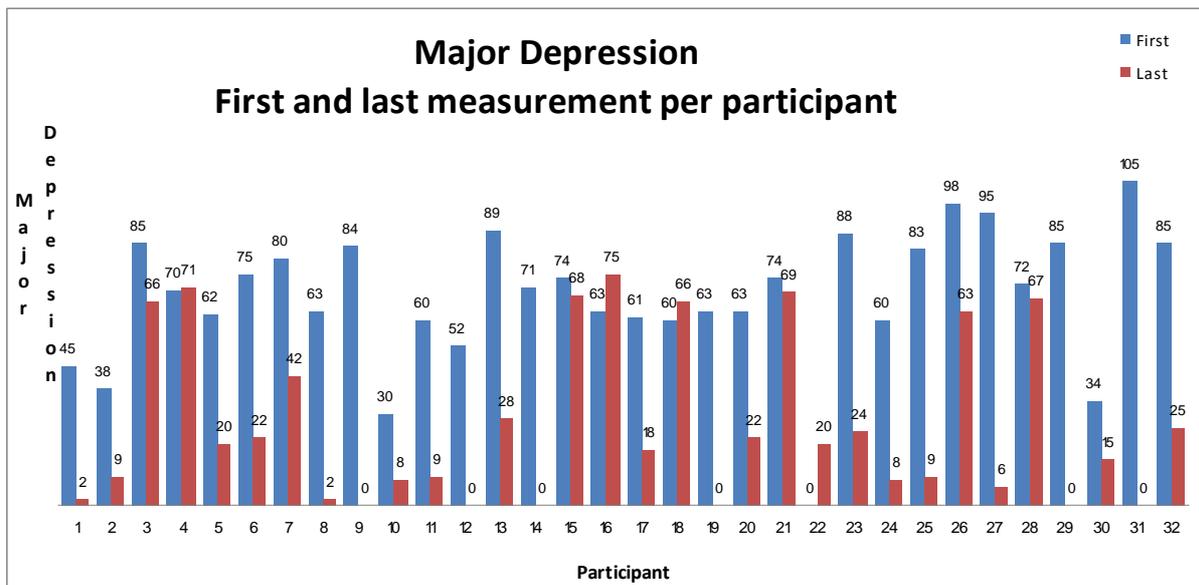
The null hypothesis was rejected for dissociation between the first measurement before EMDR treatment and the last measurement at the end of EMDR treatment. This means that EMDR treatment did lead to a significant decrease in DES-II scores for dissociation, between the first measurement before EMDR treatment and the last measurement at the end of EMDR treatment.

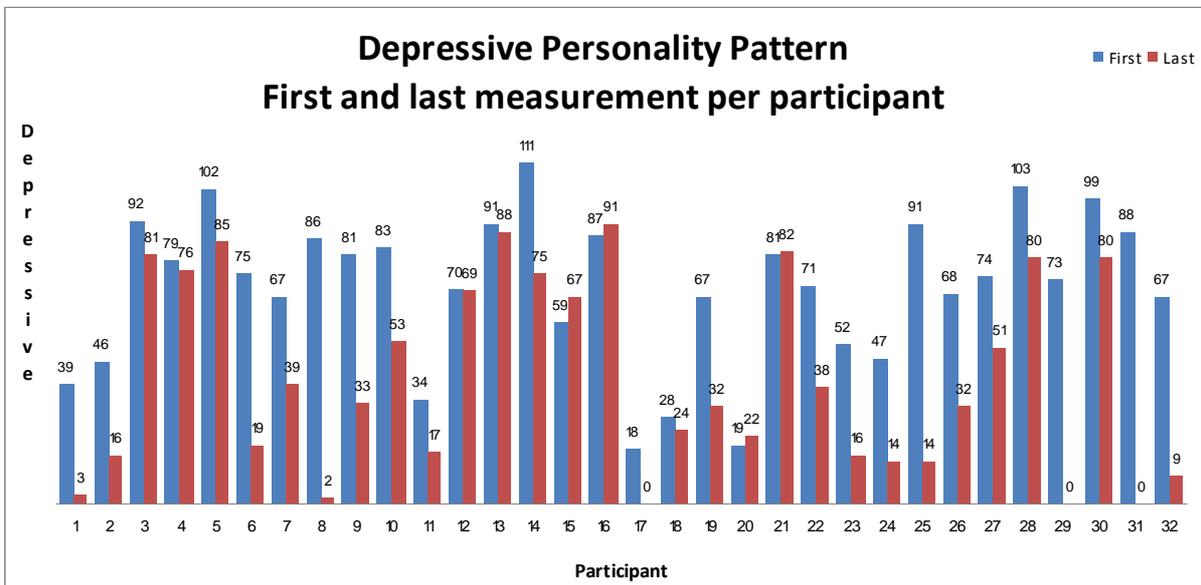
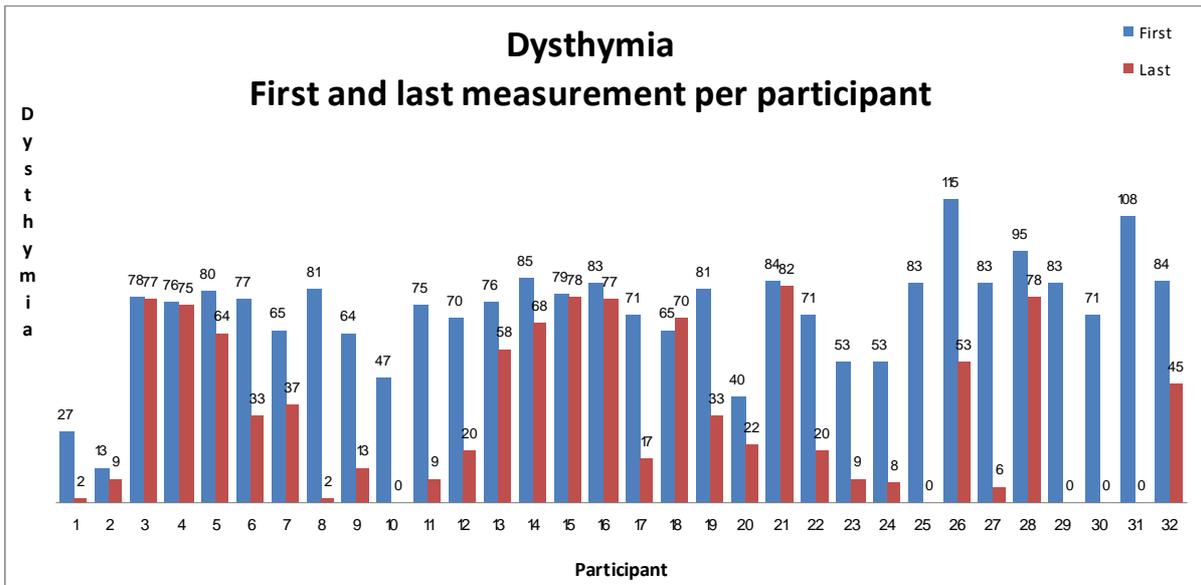
5.4.7 Association between depressive constructs between the first and last measurement

The association between the depressive constructs, major depression, dysthymia and depressive personality pattern, was analysed between the first measurement before EMDR treatment and the last measurement at the end of the EMDR treatment.

5.4.7.1 Plots for depressive constructs

Plots were performed to depict the scores obtained on the MCMI-III depressive scales; major depression, dysthymia and depressive personality pattern. The plots represent the scores obtained before the EMDR treatment (represented in blue) versus the scores obtained at the end of EMDR treatment (represented in red).





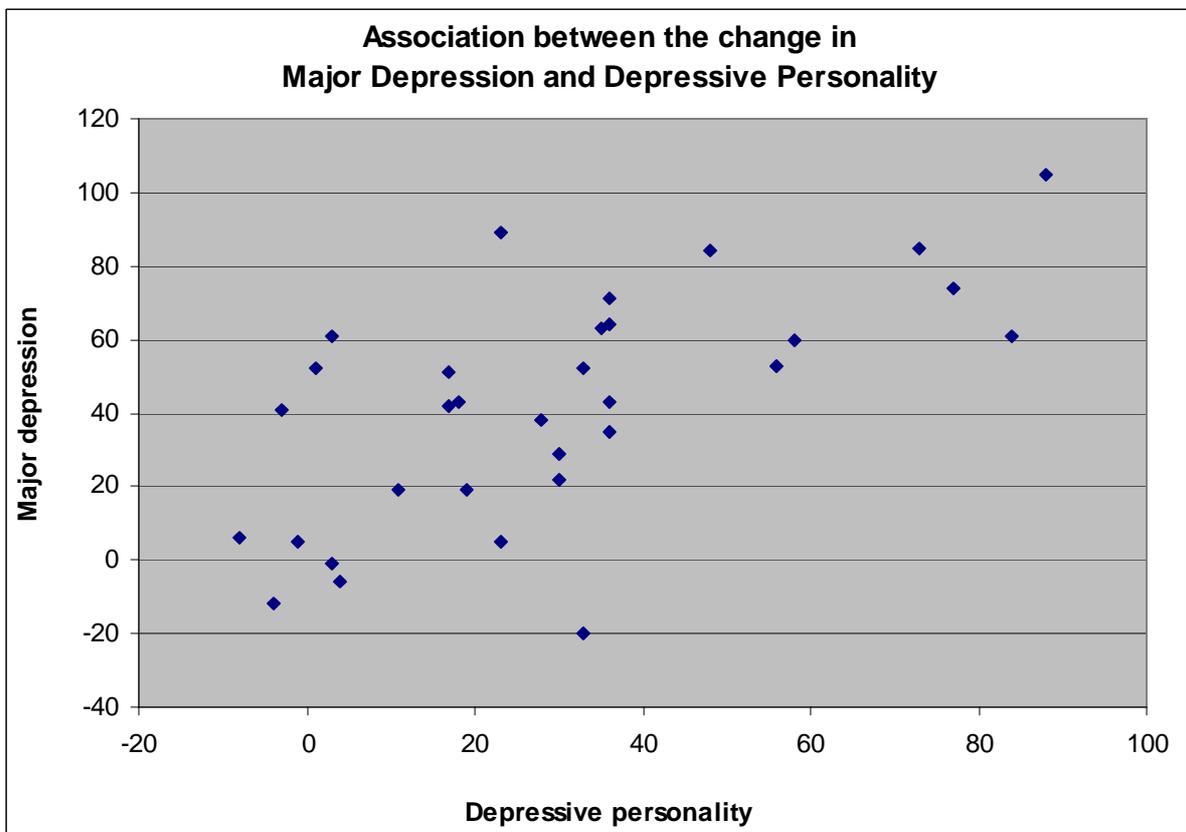
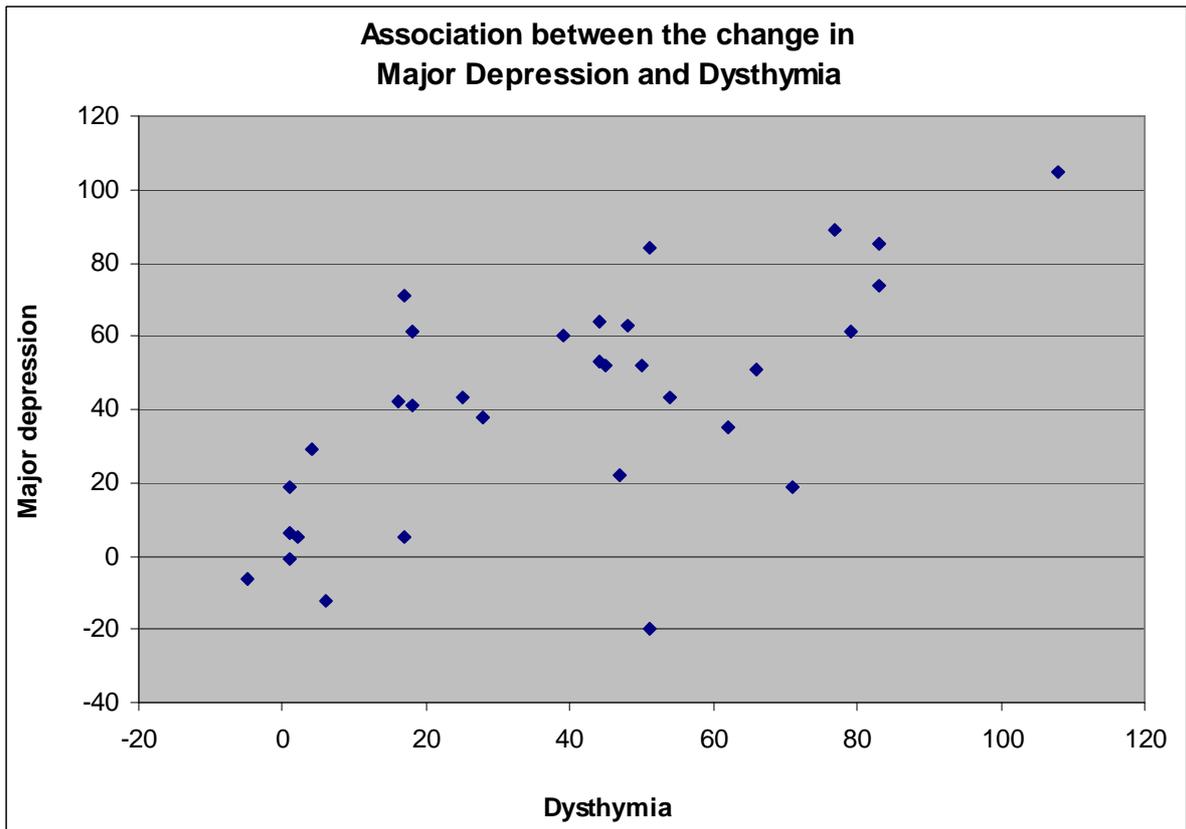
5.4.7.2 Spearman rank correlation analysis

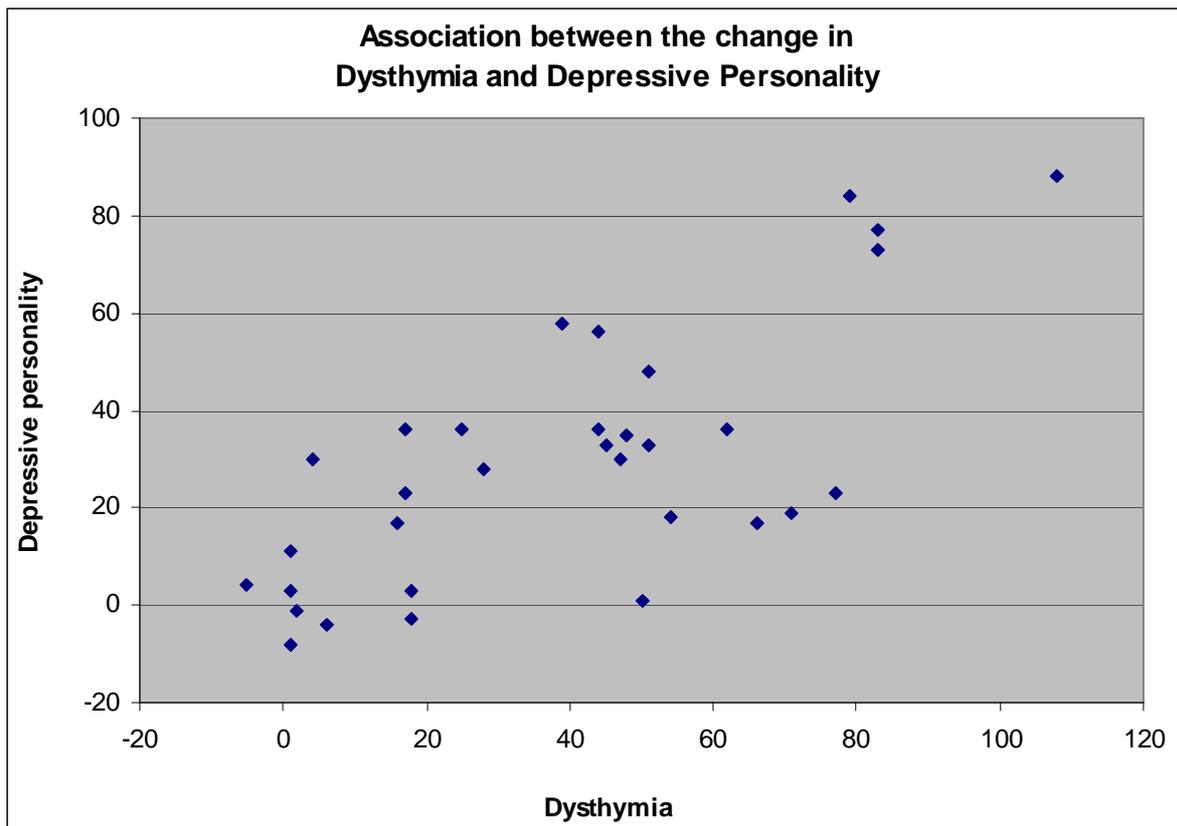
The correlation between depressive constructs, major depression, dysthymia, and depressive personality pattern was tested by using the Spearman rank correlation coefficient and the associated p-value.

Table 26. Analysis of correlation of depressive constructs between the first and last measurement

Depressive constructs	Statistic	Dysthymia	Major depression	Depressive personality
Dysthymia	Spearman correlation coefficient	1.0000	0.61681	0.61784
	p-value		0.0002	0.0002
Major depression	Spearman correlation coefficient	0.61681	1.0000	0.63863
	p-value	0.0002		<.0001
Depressive personality	Spearman correlation coefficient	0.61784	0.63863	
	p-value	0.0002	<.0001	

There is a significant positive correlation between the change in major depression and depressive personality (correlation coefficient 0.63863), dysthymia and depressive personality (correlation coefficient 0.61784), and major depression and dysthymia (correlation coefficient 0.61681) between the first measurement before EMDR treatment and the last measurement at the end of EMDR treatment. The size of the correlation coefficients shows that the correlation is only moderately strong, with the strongest correlation between major depression and depressive personality.





5.4.8 Association between depressive constructs and other clinical syndromes between the first and last measurement

The association between the depressive constructs, major depression and dysthymia, and other clinical syndromes, post traumatic stress and anxiety, was analysed between the first measurement before EMDR treatment and the last measurement at the end of EMDR treatment.

5.4.8.1 Spearman rank correlation analysis

The correlation between depressive constructs, major depression and dysthymia, and other clinical syndromes, post traumatic stress and anxiety, was tested by using the Spearman rank correlation coefficient and the associated p-value.

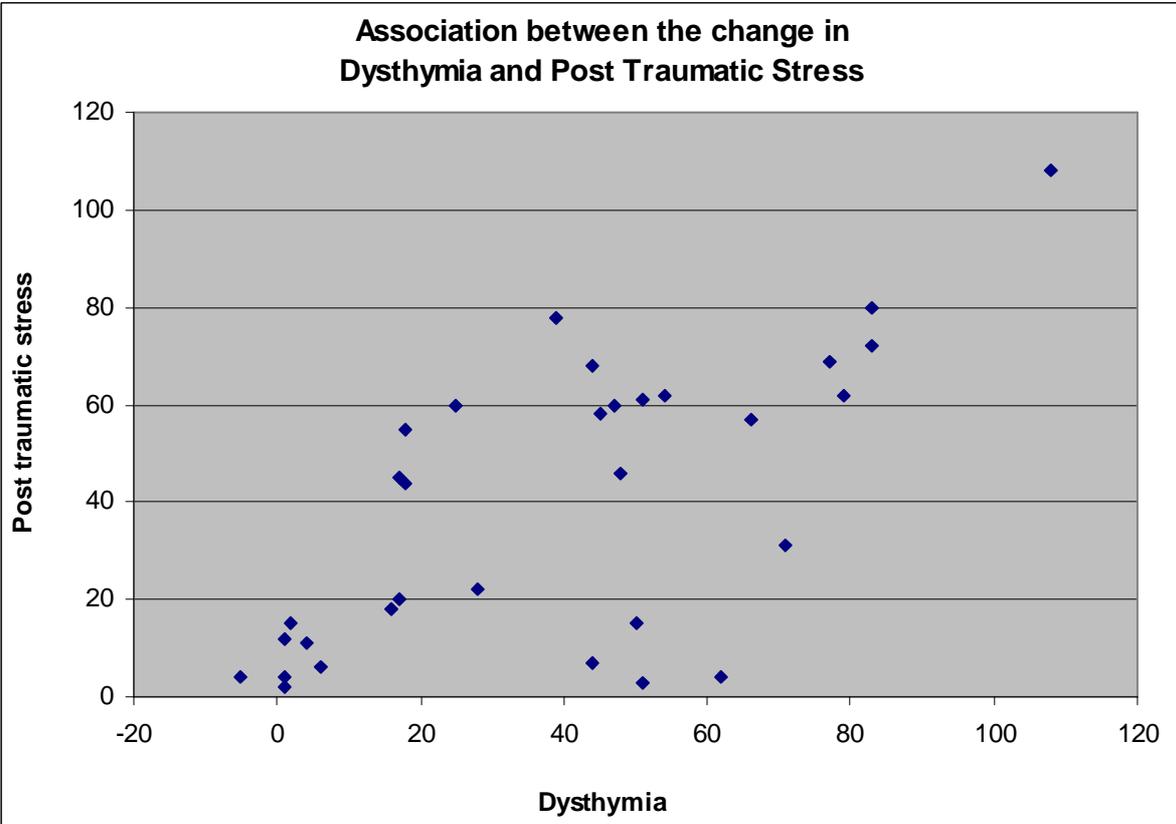
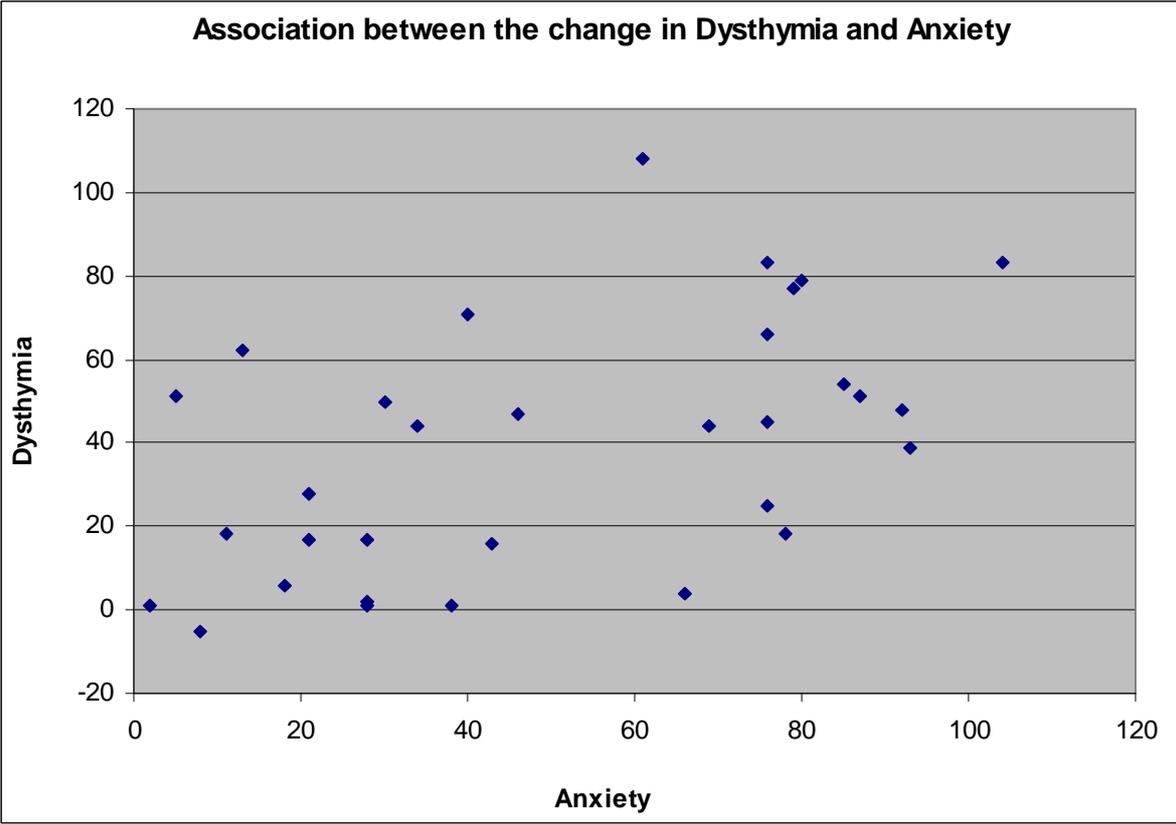
There is a significant positive correlation between the change in anxiety and post traumatic stress (correlation coefficient 0.80725), post traumatic stress and major depression

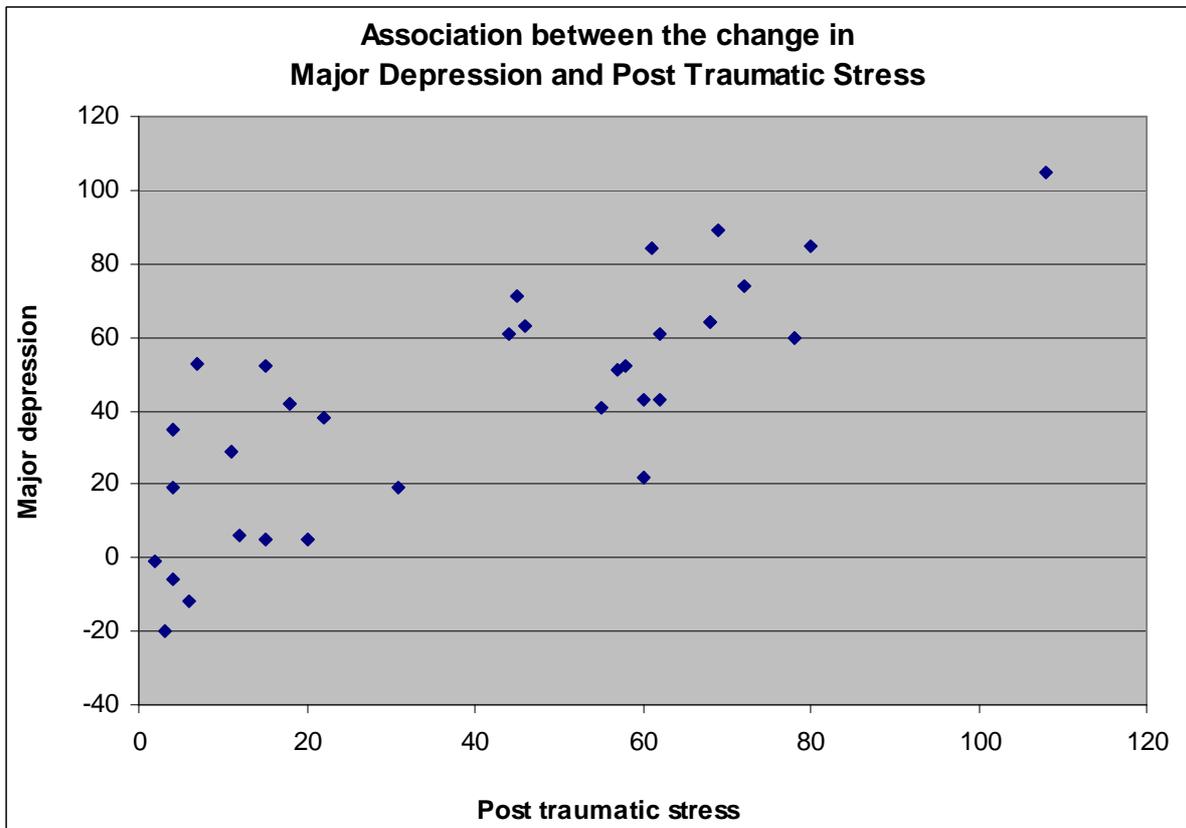
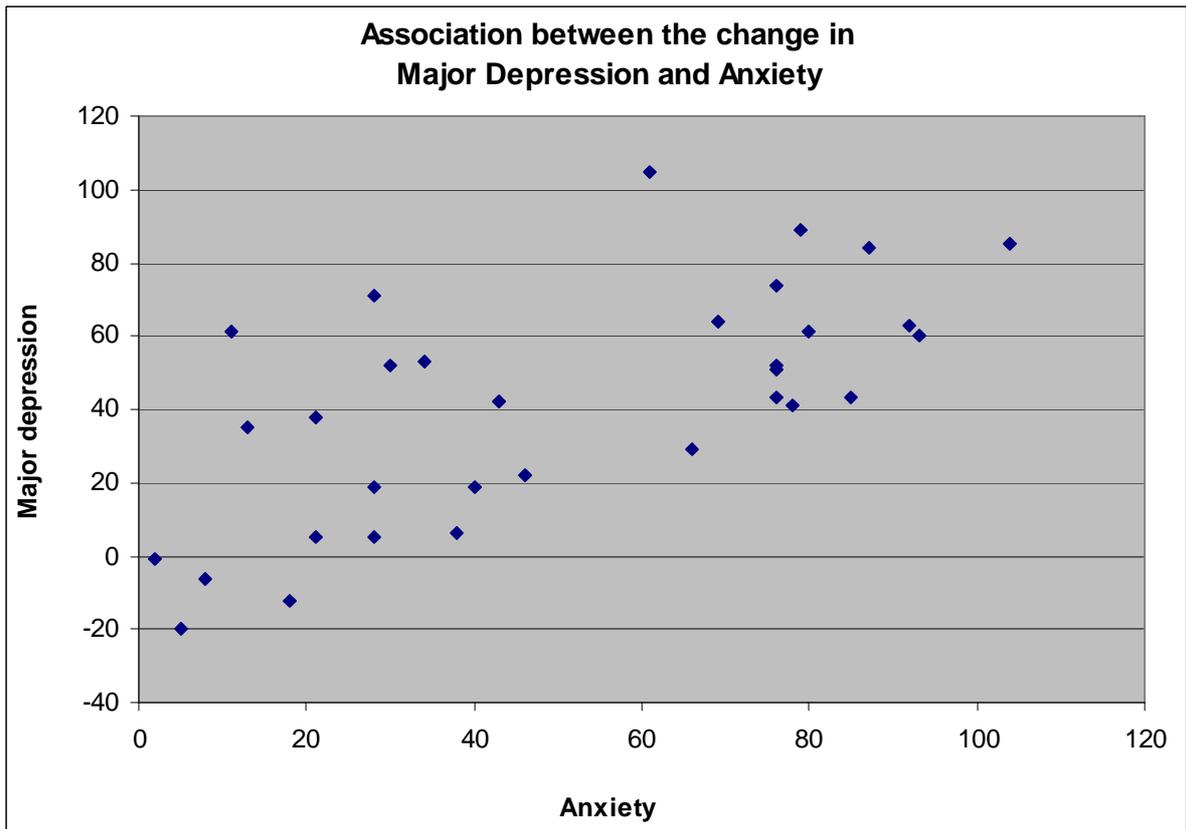
(correlation coefficient 0.78908), anxiety and major depression (correlation coefficient 0.65948), dysthymia and post traumatic stress (correlation coefficient 0.6406), dysthymia and major depression (correlation coefficient 0.61681), and anxiety and dysthymia (correlation coefficient 0.52186), between the first measurement before EMDR treatment and the last measurement at the end of EMDR treatment.

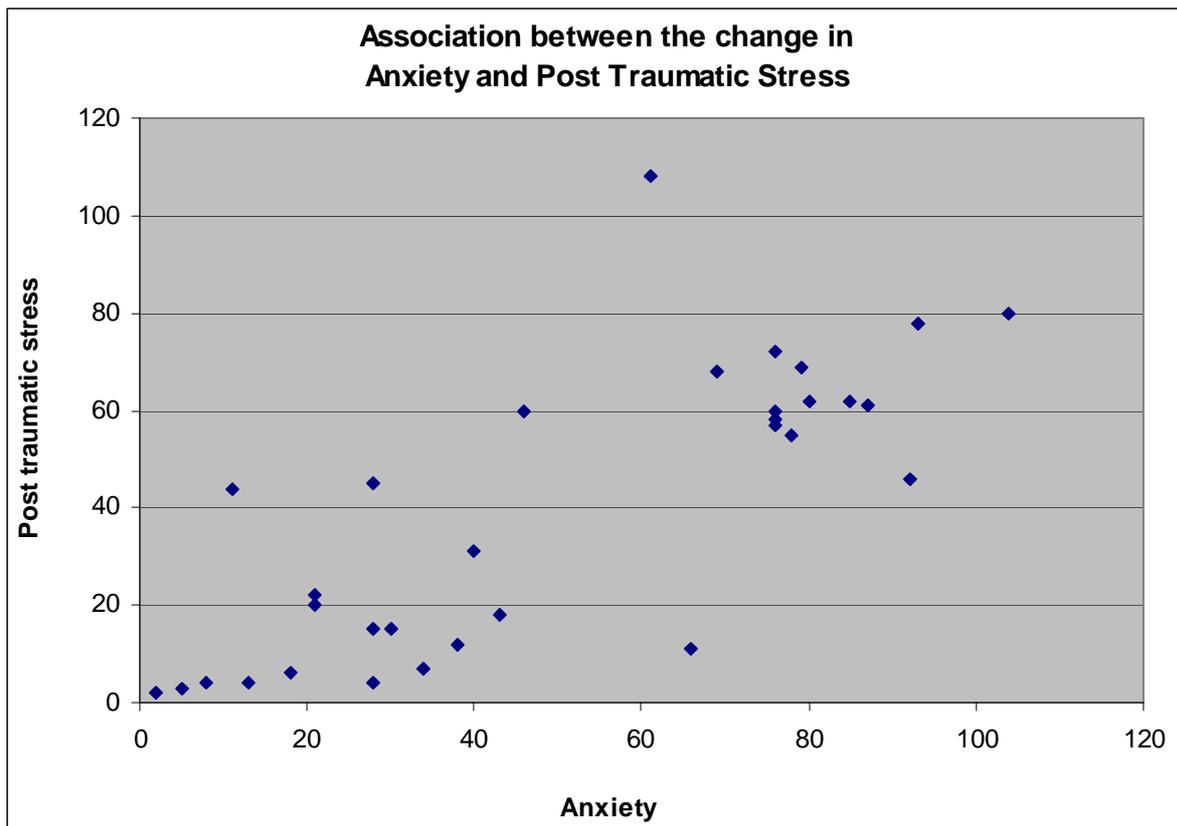
The correlation between anxiety disorder and post traumatic stress (correlation coefficient 0.80725) and post traumatic stress and major depression (correlation coefficient 0.78908) is a strong correlation. There is a moderately strong correlation between anxiety and major depression, dysthymia and post traumatic stress, and dysthymia and major depression. Although the correlation is significant, a weak correlation exists between and anxiety and dysthymia.

Table 27. Analysis of correlation between depressive constructs and clinical syndromes between the first and last measurement

Clinical constructs	Statistic	Anxiety	Dysthymia	Post traumatic stress	Major depression
Anxiety	Spearman correlation coefficient	1.0000	0.52186	0.80725	0.65948
	p-value		0.0022	<.0001	<.0001
Dysthymia	Spearman correlation coefficient	0.52186	1.0000	0.6406	0.61681
	p-value	0.0022		<.0001	0.0002
Post traumatic stress	Spearman correlation coefficient	0.80725	0.6406	1.0000	0.78908
	p-value	<.0001	<.0001		<.0001
Major depression	Spearman correlation coefficient	0.65948	0.61681	0.78908	1.0000
	p-value	<.0001	0.0002	<.0001	







5.5 Statistical Analysis for the first and follow-up measurement

The first measurement was compiled from the data of MCMI-III completed before EMDR treatment and the follow-up measurement was compiled from the data of MCMI-III completed at the end of the research study, which would be between 6 to 36 months after the completion of the EMDR treatment.

Given the relatively small sample size, and in the context of multiple univariate comparisons, an alpha level of .01 was selected for all univariate comparisons in order to reduce the likelihood of a Type-I error.

5.5.1 Change in clinical personality patterns between first and follow-up measurement

The clinical personality patterns under investigation between the first measurement before EMDR treatment and follow-up measurement are schizoid, avoidant, dependent, histrionic, narcissistic, antisocial, sadistic (aggressive), compulsive, negativistic (passive-aggressive), and masochistic (self-defeating) on the MCMI-III.

5.5.1.1 Kolmogorov-Smirnov test

The distribution of the change in personality patterns between the first measurement and the follow-up measurement was analysed. The Kolmogorov-Smirnov test combined with the distribution of each personality pattern and a normal distribution overlay was used to test for normality. Variables not normally distributed were transformed to ensure normality.

Table 28. Transformed variables on clinical personality patterns between the first and follow-up measurement

Personality patterns	Transformation
Schizoid	Squared
Dependent	Squared
Sadistic (Aggressive)	Cubic

5.5.1.2 Paired t-test

A paired t-test was performed on all the clinical personality patterns that were normally distributed to determine if the average change in clinical personality patterns between the first measurement before EMDR treatment and the follow-up measurement at the end of the research study was significantly different.

Table 29. Paired t-test for significant change in clinical personality patterns between first and follow-up measurement.

Personality patterns	Degrees of Freedom	t-value	p-value
Schizoid	26	2.56	0.0165
Avoidant	26	3.70	0.0010
Dependent	26	4.52	0.0001
Histrionic	26	-3.66	0.0011
Narcissistic	26	-4.40	0.0002
Antisocial	26	2.94	0.0068
Sadistic (Aggressive)	26	3.97	0.0005
Compulsive	26	-2.72	0.0115
Negativistic (Passive-Aggressive)	26	5.74	<.0001
Masochistic (Self-Defeating)	26	5.65	<.0001

The null hypothesis states that EMDR treatment does not lead to significant changes in MCMI-III scores for clinical personality patterns, schizoid, avoidant, dependent, histrionic, narcissistic, antisocial, sadistic, compulsive, negativistic and masochistic, between the first measurement before EMDR treatment and the follow-up measurement at the end of the research study.

The null hypothesis was rejected for clinical personality patterns, avoidant, dependent, histrionic, narcissistic, antisocial, sadistic, negativistic and masochistic, between the first measurement before EMDR treatment and the follow-up measurement at the end of the research study. This means that EMDR treatment did lead to significant changes in MCMI-III scores for personality patterns, avoidant, dependent, histrionic, narcissistic, antisocial, sadistic, negativistic and masochistic, between the first measurement before EMDR treatment and the follow-up measurement at the end of the research study.

Although the null hypothesis could not be rejected for schizoid and compulsive personality patterns at the .01 level, the obtained t-value for these personality patterns was tending towards significance (i.e., $p < .05$).

EMDR did significantly reduce the MCMI scores for clinical personality patterns, avoidant, dependent, antisocial, sadistic, negativistic and masochistic, but also significantly increased the MCMI-III scores for histrionic and narcissistic personality patterns, between the first measurement before EMDR treatment and the follow-up measurement at the end of the research study.

On the MCMI-III an elevated score on the histrionic and narcissistic scale is rarely correlated with a psychiatric condition and is often correlated with psychological health (Craig, 2008). Therefore, elevated scores on histrionic and narcissistic personality patterns on the MCMI-III with EMDR treatment suggests that EMDR may be effective in reducing disturbance and increasing emotional health. This would need to be validated by further research using a larger sample.

5.5.2 Change in severe personality patterns between first and follow-up measurement

The change in severe personality patterns, schizotypal, borderline and paranoid personality pattern, was also analysed between the first measurement before EMDR treatment and the follow-up measurement at the end of the research study.

5.5.2.1 Kolmogorov-Smirnov test

The distribution of the change in the severe personality patterns between the first measurement before EMDR treatment and the follow-up measurement at the end of the research was analysed. The Kolmogorov-Smirnov test combined with the distribution of each severe personality pattern and a normal distribution overlay was used to test for normality.

5.5.2.2 Paired t-test

A paired t-test was performed on the severe personality patterns that were normally distributed to determine if the average change between the first and follow-up measurement was significantly different.

Table 30. Paired t-test for significant change in severe personality patterns between the first and the follow-up measurement

Severe personality patterns	Degrees of Freedom	t-value	p-value
Schizotypal	26	4.86	<.0001
Borderline	26	5.58	<.0001
Paranoid	26	4.67	<.0001

The null hypothesis states that EMDR treatment does not lead to significant changes in MCMI-III scores for severe personality patterns, borderline, schizotypal, and paranoid, between the first and the follow-up measurement.

The null hypothesis was rejected for severe personality patterns, borderline, schizotypal, and paranoid, between the first and the follow-up measurement. This means that EMDR treatment did lead to significant changes in MCMI-III scores for severe personality patterns, borderline, schizotypal, and paranoid, between the first and the follow-up measurement.

EMDR did significantly reduce the MCMI scores for severe personality patterns, borderline, schizotypal, and paranoid, between the first and the follow-up measurement.

5.5.3 Change in depressive constructs between first and follow-up measurement

The depressive constructs under investigation on the MCMI-III between the first measurement before EMDR treatment and the follow-up measurement at the end of the research project are major depression, dysthymia and depressive personality pattern.

5.5.3.1 Kolmogorov-Smirnov test

The distribution of the change in depressive constructs between first and follow-up measurement was analysed. The Kolmogorov-Smirnov test combined with the distribution of the depressive constructs and a normal distribution overlay was used to test for normality.

5.5.3.2 Paired t-test

A paired t-test was performed on all depressive constructs that were normally distributed to determine if the average change in the depressive constructs between first measurement before EMDR treatment and follow-up measurement at the end of the research study was significantly different.

Table 31. Paired t-test for significant change in depressive constructs between first and follow-up measurement

Depressive constructs	Degrees of Freedom	t-value	p-value
Major Depression	26	5.40	<.0001
Dysthymia	26	4.95	<.0001
Depressive Personality	26	4.18	0.0003

The null hypothesis states that EMDR treatment does not lead to significant changes in MCMI-III scores for depressive constructs, major depression, dysthymia and depressive personality, between the first and the follow-up measurement.

The null hypothesis was rejected for depressive constructs, major depression, dysthymia and depressive personality, between the first and the follow-up measurement. This means that EMDR treatment did lead to significant changes in MCMI-III scores for depressive constructs, major depression, dysthymia and depressive personality, between the first and the follow-up measurement.

EMDR did significantly reduce the MCMI scores for depressive constructs, major depression, dysthymia and depressive personality, between the first and the follow-up measurement.

5.5.4 Change in other clinical syndromes between first and follow-up measurement

The other clinical syndromes under investigation on the MCMI-III between the first measurement before EMDR treatment and the follow-up measurement at the end of the research project are post traumatic stress and anxiety disorder.

5.5.4.1 Kolmogorov-Smirnov test

The distribution of the change in other clinical syndromes between first and follow-up measurement was analysed. The Kolmogorov-Smirnov test combined with the distribution of the other clinical syndromes and a normal distribution overlay was used to test for normality. Variables not normality distributed were transformed to ensure normality.

Table 32. Transformed variables in other clinical syndromes between the first and follow-up measurement

Clinical syndrome	Transformation
Post Traumatic Stress Disorder	Squared

5.5.4.2 Paired t-test

A paired t-test was performed on the other clinical syndromes that were normally distributed to determine if the average change in other clinical syndromes between first measurement before EMDR treatment and follow-up measurement at the end of the research study was significantly different.

Table 33. Paired t-test for significant change in other clinical syndromes between first and follow-up measurement

Clinical syndromes	Degrees of Freedom	t-value	p-value
Anxiety Disorder	26	6.34	<.0001
Post Traumatic Stress Disorder	26	5.49	<.0001

The null hypothesis states that EMDR treatment does not lead to significant changes in MCMI-III scores for other clinical syndromes, post traumatic stress and anxiety, between the first and the follow-up measurement.

The null hypothesis was rejected for other clinical syndromes, post traumatic stress and anxiety, between the first and the follow-up measurement. This means that EMDR treatment did lead to significant changes in MCMI-III scores for other clinical syndromes, post traumatic stress and anxiety, between the first and the follow-up measurement.

EMDR did significantly reduce the MCMI scores for other clinical syndromes, post traumatic stress and anxiety, between the first and the follow-up measurement.

5.5.5 Change in severe clinical syndromes between first and follow-up measurement

Even though no participants in this research study had clinically significant bipolar (manic) disorder, thought disorder, delusional disorder, and alcohol and drug dependence, they did complete these scales on the MCMI-III. The change in severe clinical syndromes, bipolar (manic) disorder, thought disorder, delusional disorder, and alcohol and drug dependence, between the first measurement before EMDR treatment and the follow-up measurement at the end of the research study, was analysed.

5.5.5.1 Kolmogorov-Smirnov test

The distribution of the change in the severe clinical syndromes between the first measurement before EMDR treatment and the follow-up measurement at the end of the research, was analysed. The Kolmogorov-Smirnov test combined with the distribution of each severe clinical syndromes and a normal distribution overlay was used to test for normality. Variables not normality distributed were transformed to ensure normality.

Table 34. Transformed variables on severe clinical syndromes between the first and follow-up measurement

Severe clinical syndromes	Transformation
Thought disorder	Cubic
Delusional disorder	Square root

5.5.5.2 Paired t-test

A paired t-test was performed on the severe clinical syndromes that were normally distributed to determine if the average change between the first and follow-up measurement was significantly different.

Table 35. Paired t-test for significant change in severe clinical syndromes between the first and follow-up measurement

Severe clinical syndromes	Degrees of Freedom	t-value	p-value
Bipolar (manic)	26	1.81	0.0814
Thought disorder	26	6.00	<.0001
Delusional disorder	26	1.53	0.1388
Alcohol dependence	26	2.44	0.0217
Drug dependence	26	2.01	0.0553

The null hypothesis states that EMDR treatment does not lead to significant changes in MCMI-III scores for severe clinical syndromes, bipolar, thought disorder, delusional disorder, and alcohol and drug dependence, between the first and follow-up measurement.

The null hypothesis was rejected for severe clinical syndromes, thought disorder, between the first and follow-up measurement. This means that EMDR treatment did lead to significant changes in MCMI-III scores for severe clinical syndromes, thought disorder, between the first and follow-up measurement.

Although the null hypothesis could not be rejected for alcohol dependence at the .01 level, the obtained t-value was tending towards significance (i.e., $p < .05$).

The null hypothesis was not rejected for severe clinical syndromes, bipolar, delusional disorder and drug dependence, between the first and follow-up measurement. This

means that EMDR treatment did not lead to significant changes in MCMI-III scores for bipolar, delusional disorder and drug dependence between the first and follow-up measurement.

EMDR treatment did significantly reduce the MCMI-III scores for severe clinical syndromes, thought disorder, between the first and follow-up measurement. However EMDR did not significantly reduce the MCMI-III scores for bipolar, delusional disorder, and alcohol and drug dependence between the first and follow-up measurement.

5.5.6 Change in dissociation between first and follow-up measurement

The Dissociative Experience Scale II (DES-II) was used to collect data for the measurement of dissociation. The data between the first measurement before EMDR treatment and the follow-up measurement at the end of the research study was analysed.

5.5.6.1 Paired t-test

A paired t-test was performed on dissociation to determine if the average change between the first and follow-up measurement was significantly different.

Table 36. Paired t-test for significant change in dissociation between first and follow-up measurement

	Degrees of Freedom	t-value	p-value
Dissociation	26	4.91	<.0001

The analysis shows that there was a significant change in dissociation as measured by the DES-II.

The null hypothesis states that EMDR treatment does not lead to significant changes in DES-II scores for dissociation between the first and follow-up measurement.

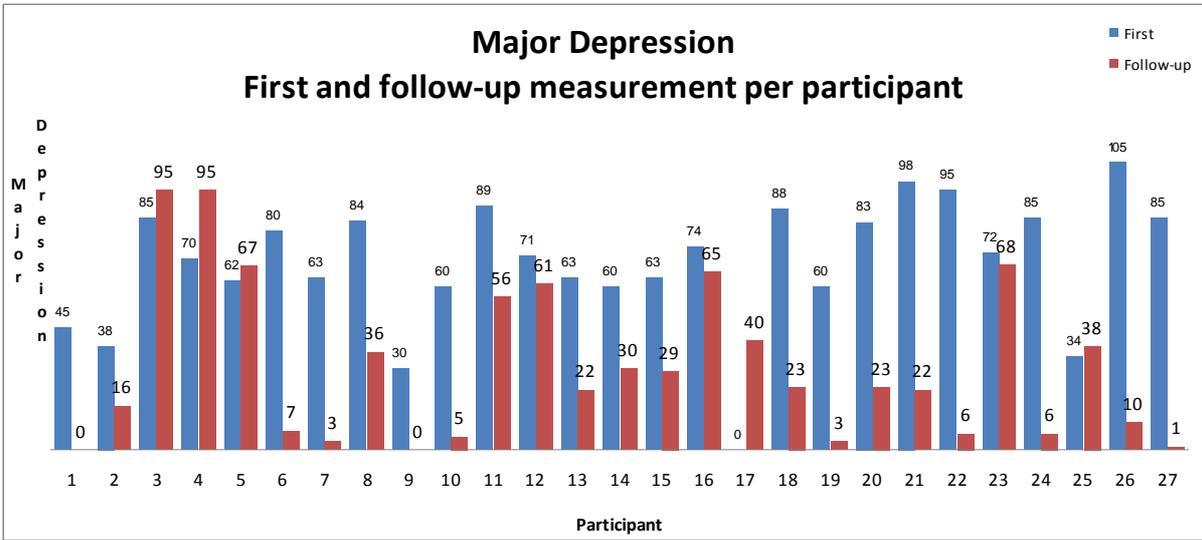
The null hypothesis was rejected for dissociation between the first and follow-up measurement. This means that EMDR treatment did lead to significant decreases in DES-II scores for dissociation, between the first and follow-up measurement.

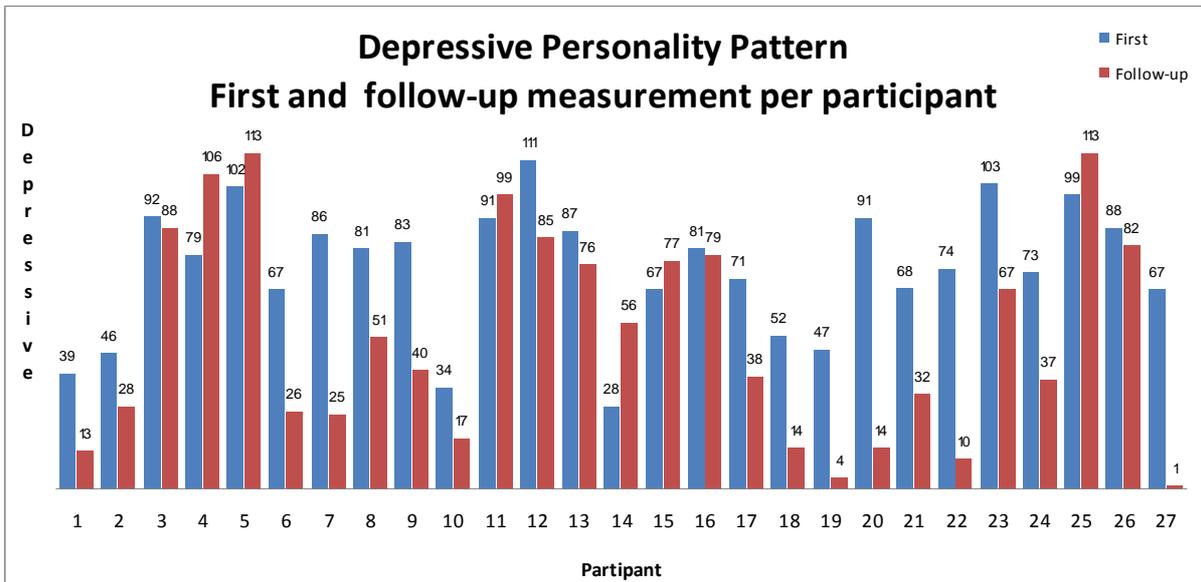
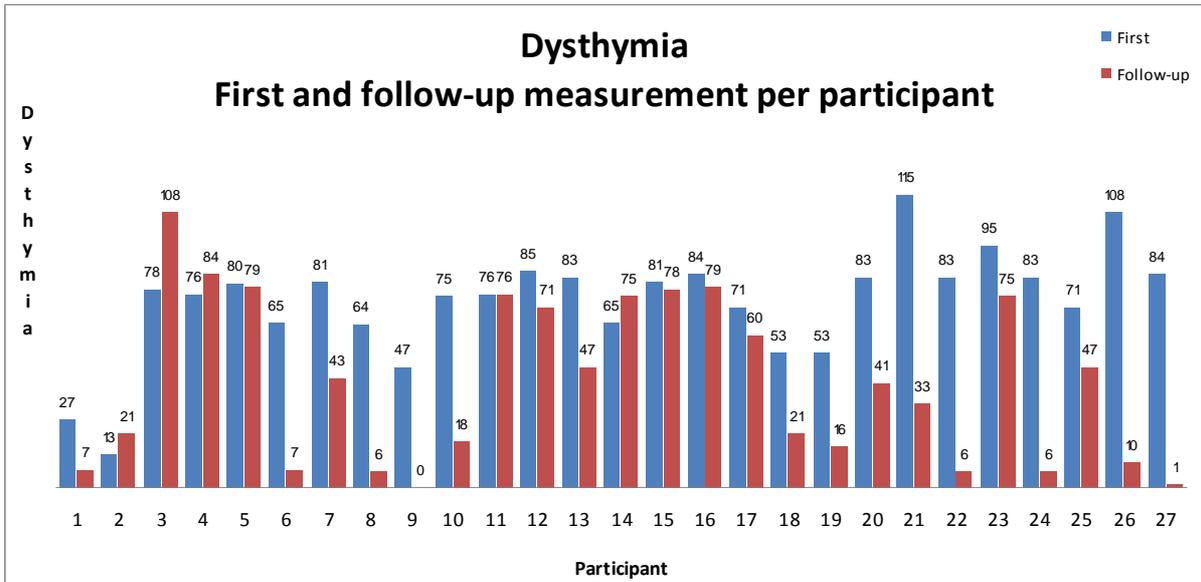
5.5.7 Association between the depressive constructs between first and follow-up measurement

The association between the depressive constructs was analysed between the first and follow-up measurement. The depressive constructs under investigation in this study are major depression, dysthymia and depressive personality pattern on the MCMI-III.

5.5.7.1 Plots for depressive symptoms

Plots were performed to depict the scores obtained on the MCMI-III depressive scales; major depression, dysthymia and depressive personality pattern. The plots represent the scores obtained before the EMDR treatment (represented in blue) versus the scores obtained at the follow-up measure at the end of research study (represented in red).





5.5.7.2 Spearman rank correlation analysis

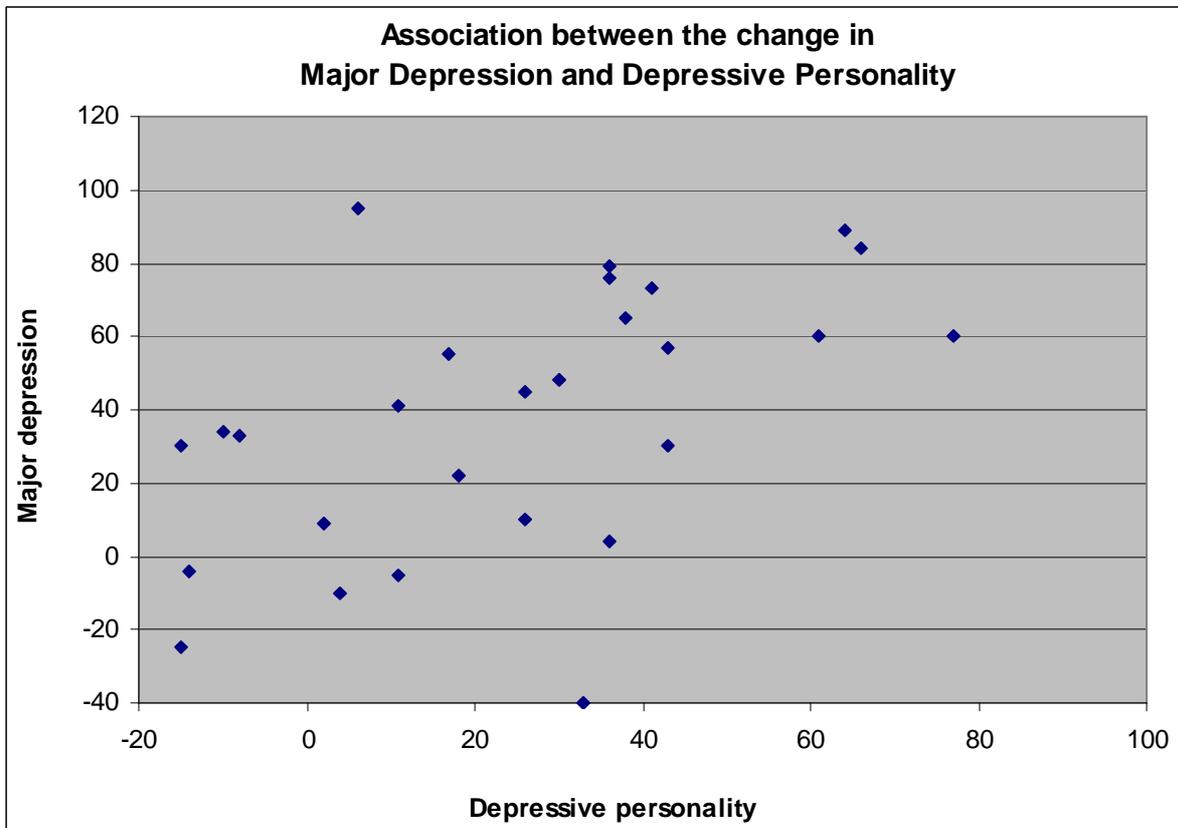
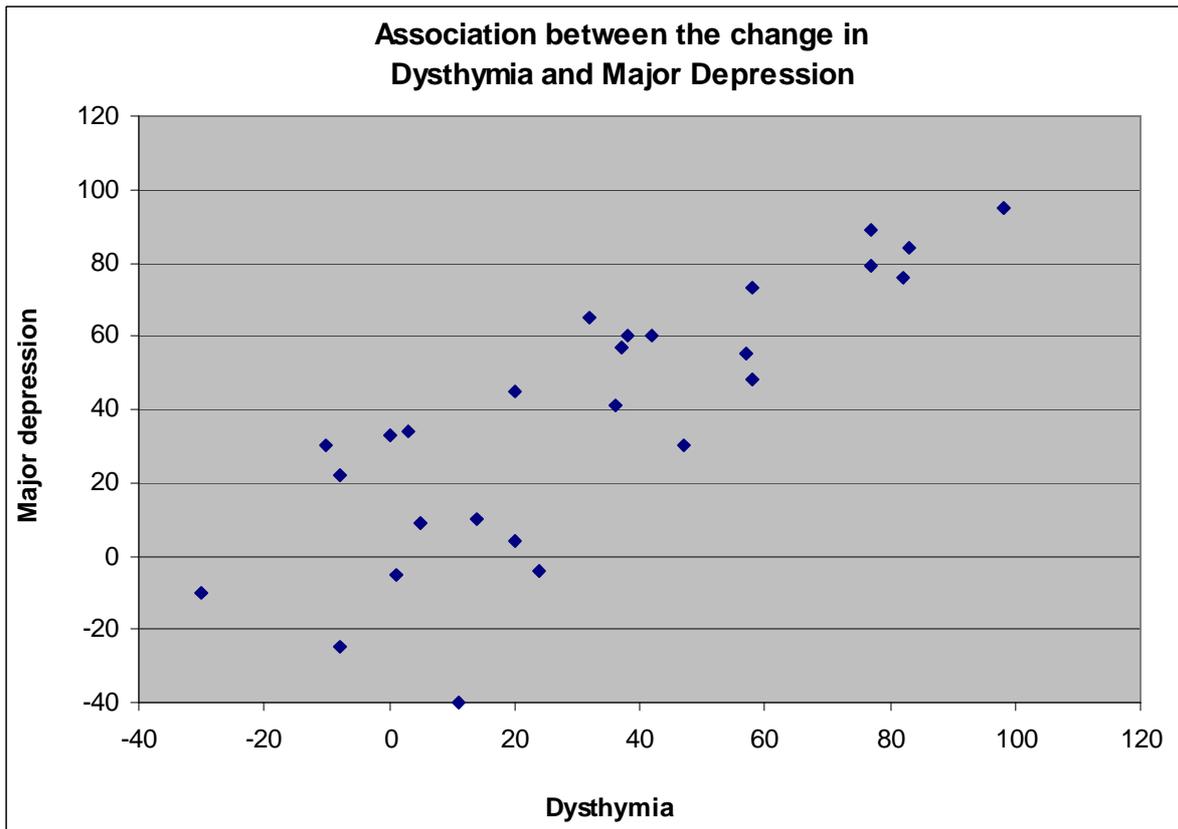
The correlation between depressive symptoms; major depression, dysthymia, and depressive personality pattern was tested by using the Spearman rank correlation coefficient and the associated p-value.

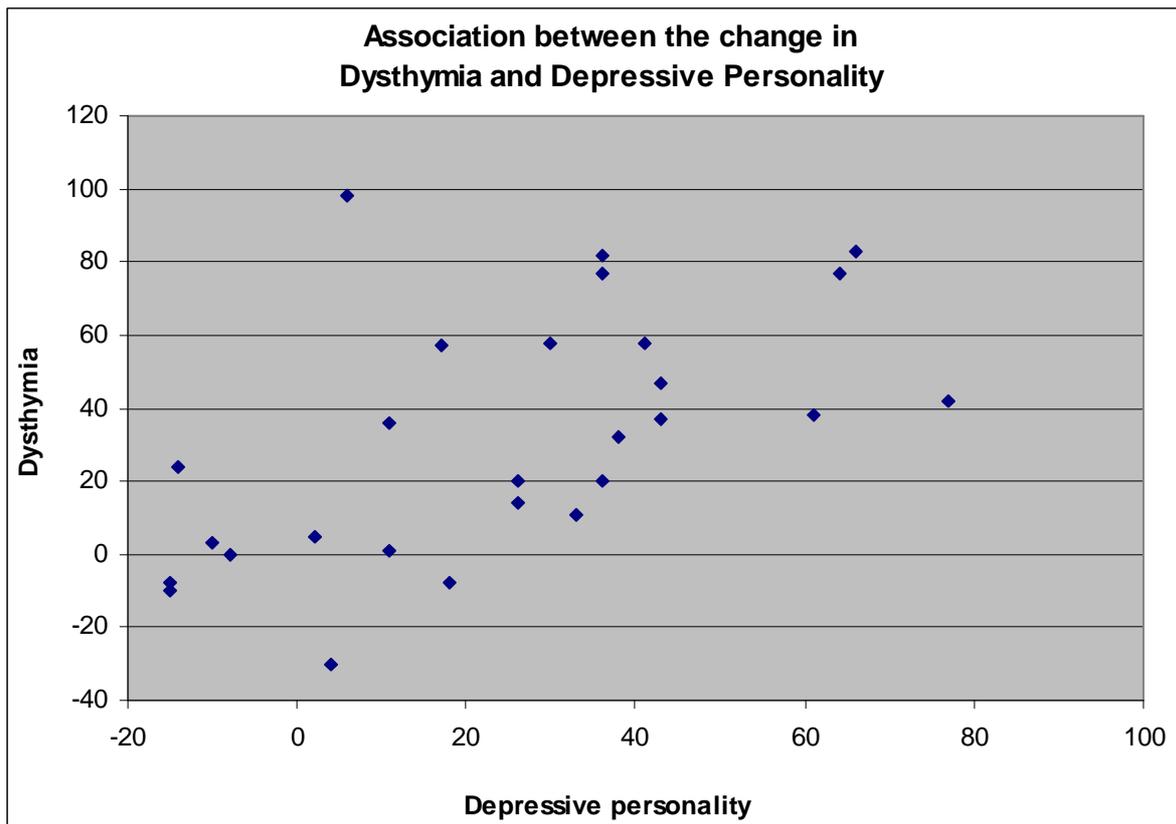
Table 37. Analysis of correlation of depressive constructs between the first and follow-up measurement

Depressive constructs	Statistic	Dysthymia	Major depression	Depressive personality
Dysthymia	Spearman correlation coefficient	1.0000	0.82921	0.65867
	p-value		<.0001	0.0002
Major depression	Spearman correlation coefficient	0.82921	1.0000	0.59887
	p-value	<.0001		0.0001
Depressive personality	Spearman correlation coefficient	0.65867	0.59887	1.0000
	p-value	0.0002	0.0001	

There is a significant positive correlation between the change in dysthymia and major depression (correlation coefficient 0.82921), dysthymia and depressive personality pattern (correlation coefficient 0.65867), and major depression and depressive personality pattern (correlation coefficient 0.59887), between the first measurement before EMDR treatment and the follow-up measurement at the end of the research study.

The correlation between dysthymia and major depression is a strong correlation (correlation coefficient 0.82921). There is a moderate correlation between dysthymia and depressive personality pattern, and major depression and depressive personality pattern.





5.5.8 Association between depressive constructs and other clinical syndromes between first and follow-up measurement

The association between the depressive constructs, major depression and dysthymia, and clinical syndromes, post traumatic stress and anxiety, was analysed between the first measurement before EMDR treatment and the follow-up measurement.

5.5.8.1 Spearman rank correlation analysis

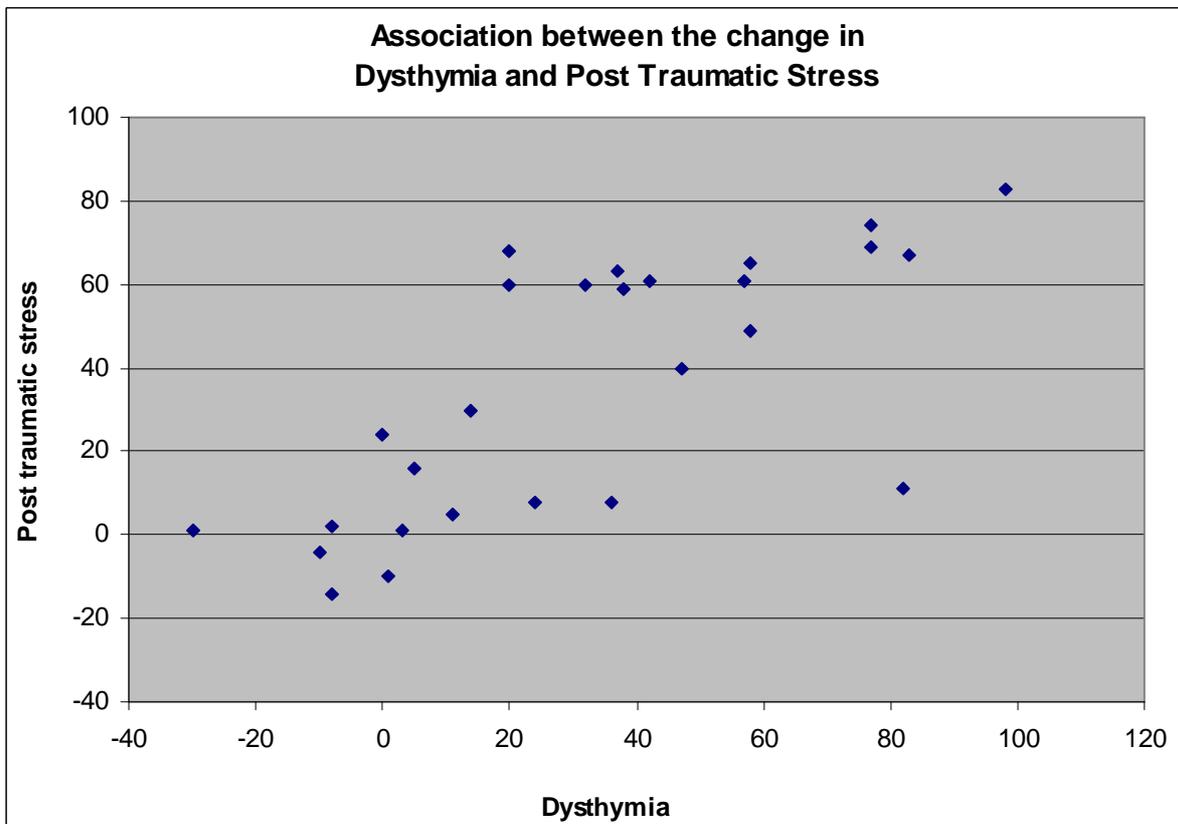
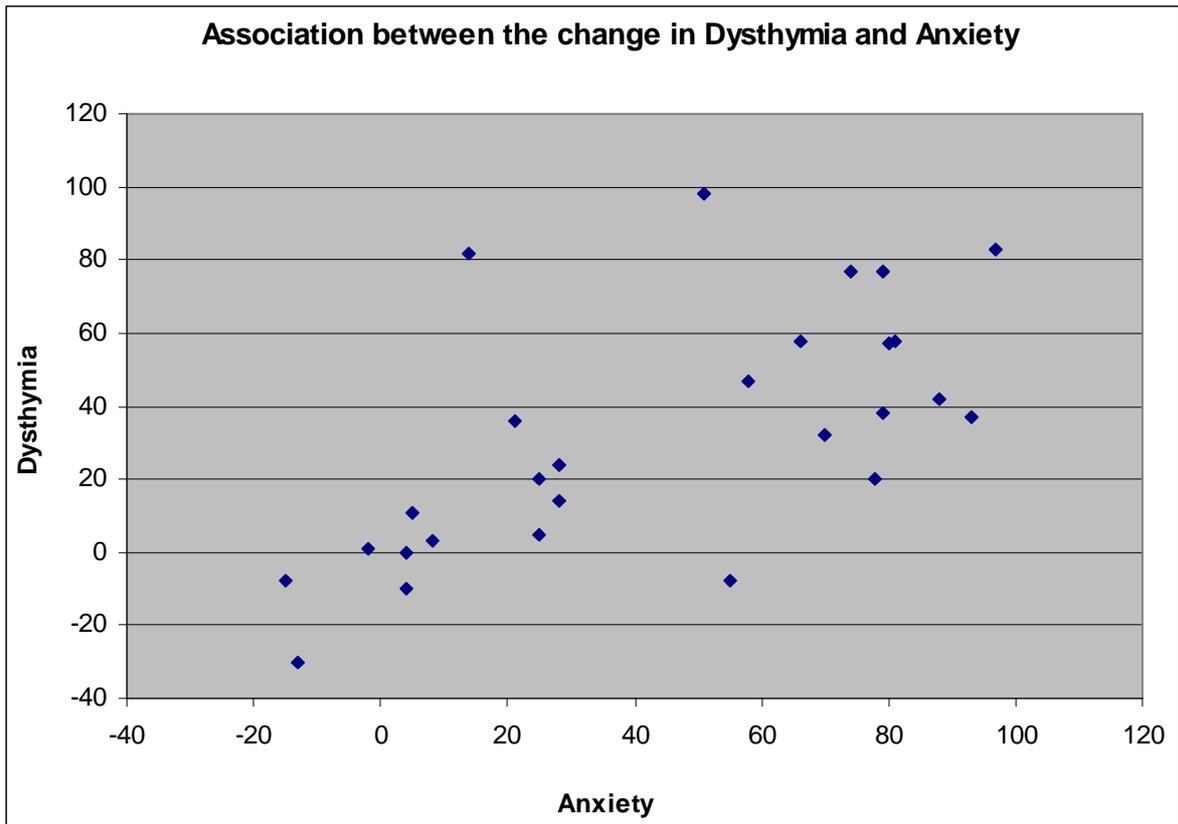
The correlation between depressive constructs, major depression and dysthymia, and clinical syndromes, post traumatic stress and anxiety, was tested by using the Spearman rank correlation coefficient and the associated p-value.

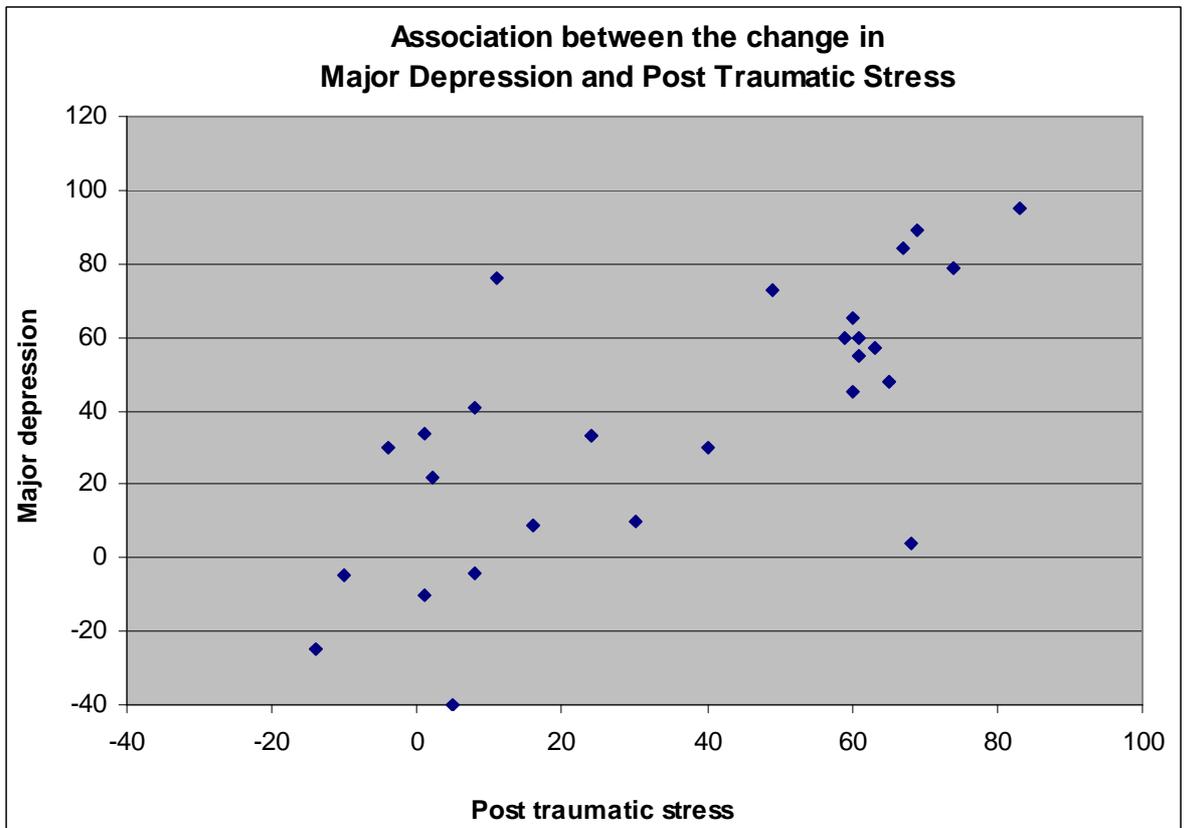
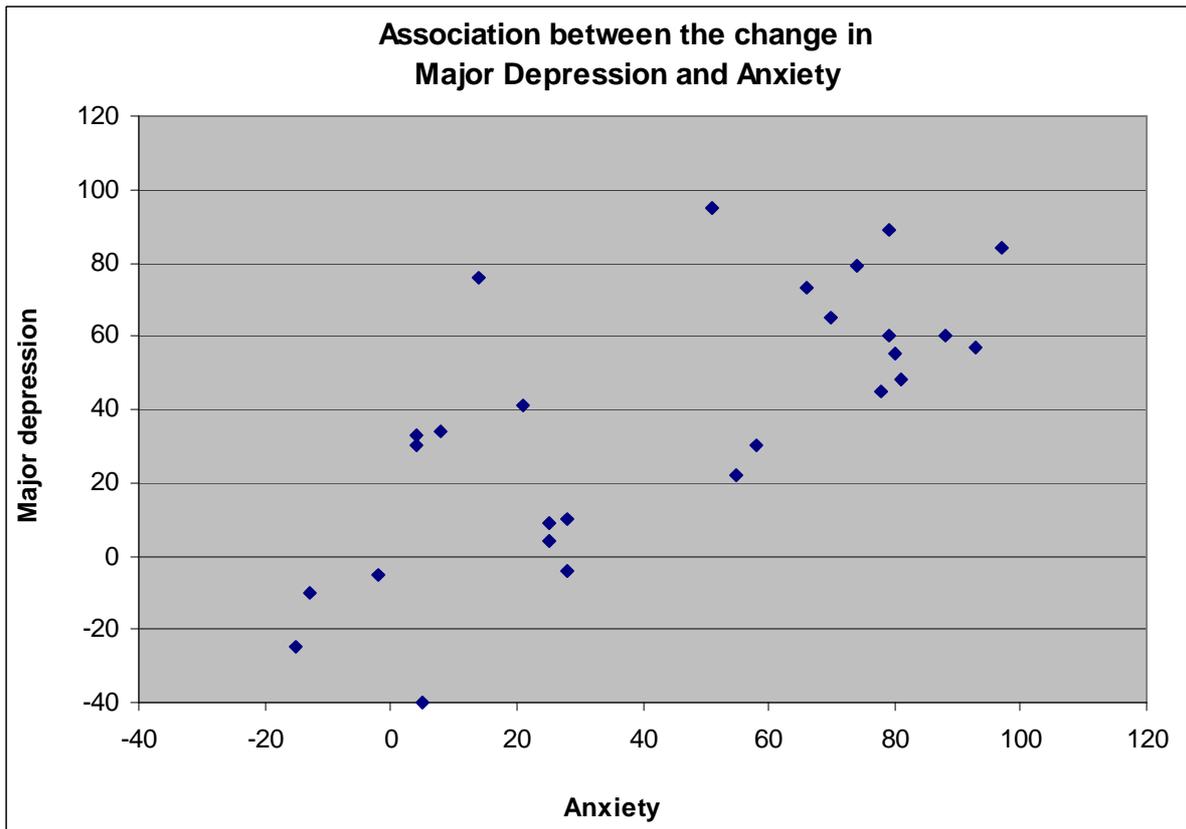
Table 38. Analysis of correlation between depressive constructs and other clinical syndromes between first and follow-up measurement

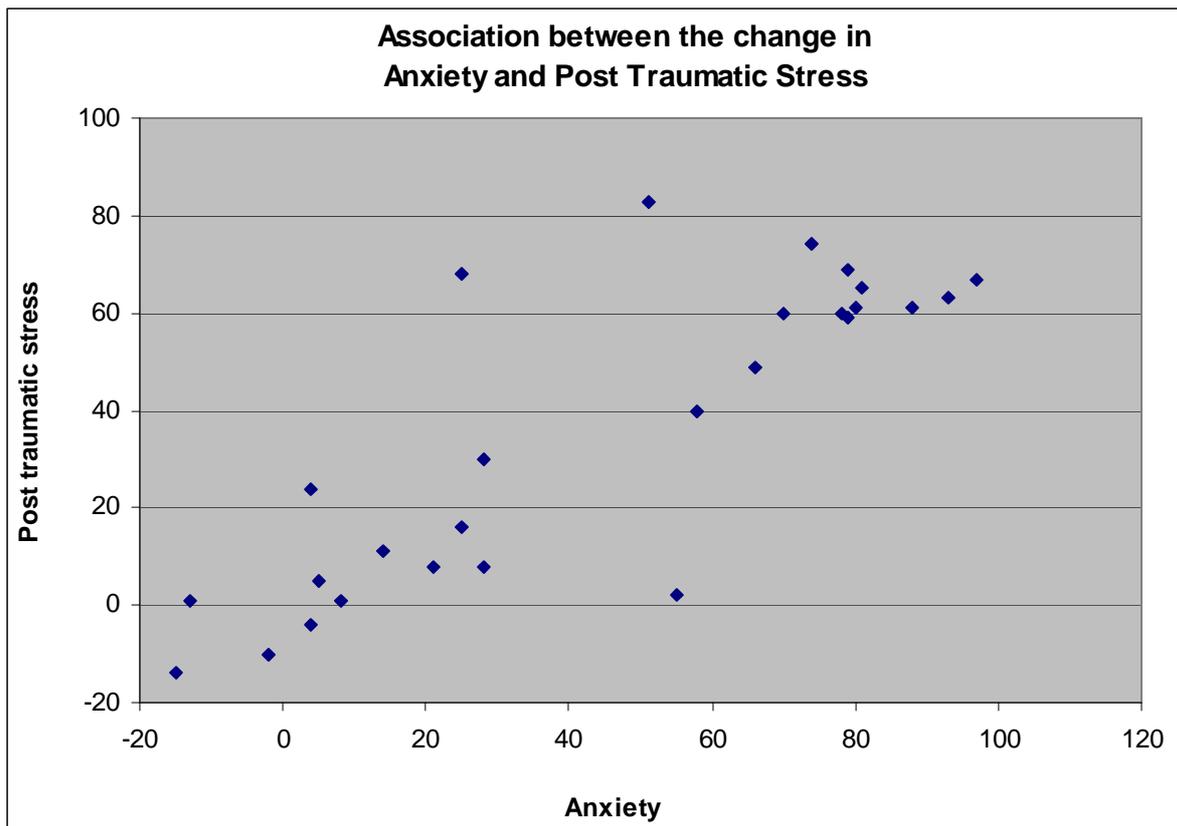
Clinical constructs	Statistic	Anxiety	Dysthymia	Post traumatic stress	Major depression
Anxiety	Spearman correlation coefficient	1.0000	0.69468	0.7801	0.67705
	p-value		<.0001	<.0001	0.0001
Dysthymia	Spearman correlation coefficient	0.69468	1.0000	0.77858	0.82921
	p-value	<.0001		<.0001	<.0001
Post traumatic stress	Spearman correlation coefficient	0.7801	0.77858	1.0000	0.72212
	p-value	<.0001	<.0001		<.0001
Major depression	Spearman correlation coefficient	0.67705	0.82921	0.72212	1.0000
	p-value	0.0001	<.0001	<.0001	

There is a significant positive correlation between the change in dysthymia and major depression (correlation coefficient 0.82921), anxiety and post traumatic stress (correlation coefficient 0.7801), dysthymia and post traumatic stress (correlation coefficient 0.77858), post traumatic stress and major depression (correlation coefficient 0.72212), anxiety and dysthymia (correlation coefficient 0.69468), and anxiety and major depression (correlation coefficient 0.67705), between the first measurement before the EMDR treatment and the follow-up measurement at the end of the research study.

The correlation between dysthymia and major depression (correlation coefficient 0.82921) and anxiety disorder and post traumatic stress (correlation coefficient 0.7801) is a strong correlation.







5.6 Statistical Analysis of the last and follow-up measurement

The last measurement was compiled from the data of MCMI-III completed at the end of the EMDR treatment and the follow-up measurement was compiled from the data of MCMI-III completed at the end of the research study, which would be between 6 to 36 months after the completion of the EMDR treatment.

Given the relatively small sample size, and in the context of multiple univariate comparisons, an alpha level of .01 was selected for all univariate comparisons in order to reduce the likelihood of a Type-I error.

5.6.1 Change in clinical personality patterns between last and follow-up measurement

The clinical personality patterns under investigation between the last measurement at the end of the EMDR treatment and the follow-up measurement are schizoid, avoidant,

dependent, histrionic, narcissistic, antisocial, sadistic (aggressive), compulsive, negativistic (passive-aggressive), and masochistic (self-defeating) on the MCMI-III.

5.6.1.1 Kolmogorov-Smirnov test

The distribution of the change in clinical personality patterns between the last measurement at the end of EMDR treatment and the follow-up measurement was analysed. The Kolmogorov-Smirnov test combined with the distribution of each clinical personality pattern and a normal distribution overlay was used to test for normality. Variables not normality distributed were transformed to ensure normality.

Table 39. Transformed variables on clinical personality patterns between the last and follow-up measurement

Personality patterns	Transformation
Dependent	Cubic
Sadistic (Aggressive)	Square root

The dependent personality pattern could not be fully transformed to normality, but normality was accepted based on the visual distribution.

5.6.1.2 Paired t-test

A paired t-test was performed on all the clinical personality patterns that were normally distributed to determine if the average change in the clinical personality patterns between the last measurement at the end of EMDR treatment and the follow-up measurement at the end of the research was significantly different.

Table 40. Paired t-test for significant change in clinical personality patterns between last and follow-up measurement

Personality patterns	Degrees of Freedom	t-value	p-value
Schizoid	26	1.60	0.1210
Avoidant	26	0.72	0.4789
Dependent	26	1.23	0.2288
Histrionic	26	-0.59	0.5575
Narcissistic	26	-1.30	0.2040
Antisocial	26	0.02	0.9851
Sadistic (Aggressive)	26	-0.07	0.9429
Compulsive	26	-1.60	0.1227
Negativistic (Passive-Aggressive)	26	1.36	0.1849
Masochistic (Self-Defeating)	26	1.83	0.0791

The null hypothesis states that EMDR treatment does not lead to significant changes in MCMI-III scores for personality patterns, schizoid, avoidant, dependent, histrionic, narcissistic, antisocial, sadistic, compulsive, negativistic and masochistic, between the last measurement at the end of EMDR treatment and the follow-up measurement at the end of the research study.

The null hypothesis was not rejected for personality patterns schizoid, avoidant, dependent, histrionic, narcissistic, antisocial, sadistic, compulsive, negativistic and masochistic, between the last measurement at the end of EMDR treatment and the follow-up measurement at the end of the research study.

This means that there was no significant change in MCMI-III scores for personality patterns, schizoid, avoidant, dependent, histrionic, narcissistic, antisocial, sadistic, compulsive, negativistic and masochistic, between the last measurement at the end of EMDR treatment and the follow-up measurement at the end of the research study. This means that the gains were maintained between the measurement at the end of the EMDR treatment and the follow-up measurement at the end of the study for all the personality patterns.

5.6.2 Change in severe personality patterns between last and follow-up measurement

The change in severe personality patterns, schizotypal, borderline and paranoid, was also analysed between the last measurement at the end of the EMDR treatment and the follow-up measurement at the end of the research.

5.6.2.1 Kolmogorov-Smirnov test

The distribution of the change in the severe personality patterns between the last measurement at the end of EMDR treatment and the follow-up measurement at the end of the research was analysed. The Kolmogorov-Smirnov test combined with the distribution of each personality pattern and a normal distribution overlay was used to test for normality. Variables not normality distributed were transformed to ensure normality.

Table 41. Transformed variables on severe personality patterns between last and follow-up measurement

Severe personality patterns	Transformation
Schizotypal	Square root - max
Paranoid	Square root

5.6.2.2 Paired t-test

A paired t-test was performed on the severe personality patterns that were normally distributed to determine if the average change between the last and follow-up measurement was significantly different.

Table 42. Paired t-test for significant change in severe personality patterns between the last and the follow-up measurement

Severe personality patterns	Degrees of Freedom	t-value	p-value
Schizotypal	26	0.16	0.8719
Borderline	26	0.75	0.4602
Paranoid	26	1.23	0.2315

The null hypothesis states that EMDR treatment does not lead to significant changes in MCMI-III scores for severe personality patterns, borderline, schizotypal, and paranoid, between the end of the EMDR treatment and the follow-up measurement at the end of the research study.

The null hypothesis was not rejected for severe personality patterns, borderline, schizotypal, and paranoid, between the end of the EMDR treatment and the follow-up measurement at the end of the research study. This means that the gains were maintained between the end of the EMDR treatment and the follow-up measurement at the end of the research study.

5.6.3 Change in depressive constructs between last and follow-up measurement

The depressive constructs under investigation on the MCMI-III between the last measurement at the end of the EMDR treatment and the follow-up measurement are major depression, dysthymia and depressive personality.

5.6.3.1 Kolmogorov-Smirnov test

The distribution of the change in depressive constructs between the last measurement at the end of EMDR treatment and the follow-up measurement at the end of the research study was analysed. The Kolmogorov-Smirnov test combined with the distribution of each clinical syndrome and a normal distribution overlay was used to test for normality. Variables not normality distributed were transformed to ensure normality.

Table 43. Transformed variables on depressive constructs between the last and follow-up measurement

Depressive constructs	Transformation
Depressive	Square root

5.6.3.2 Paired t-test

A paired t-test was performed on depressive constructs, major depression, dysthymia and depressive personality, that were normally distributed to determine if the average change in the depressive constructs between the last measurement at the end of EMDR treatment and the follow-up measurement at the end of the study was significantly different.

Table 44. Paired t-test for significant change in depressive constructs between last and follow-up measurement.

Depressive constructs	Degrees of Freedom	t-value	p-value
Major Depression	26	0.88	0.3859
Dysthymia	26	1.84	0.0778
Depressive Personality	26	2.06	0.0497

The null hypothesis states that EMDR treatment does not lead to significant changes in MCMI-III scores for depressive constructs, major depression, dysthymia and depressive personality, between the end of the EMDR treatment and the follow-up measurement at the end of the research study.

The null hypothesis was not rejected for depressive constructs, major depression and dysthymia, between the end of the EMDR treatment and the follow-up measurement at the end of the research study. This means that the gains were maintained for major depression and dysthymia between the end of the EMDR treatment and the follow-up measurement at the end of the research study.

Although the null hypothesis could not be rejected for depressive personality pattern at the .01 level, the obtained t-value was tending towards significance (i.e., $p < .05$).

This means that the gains were not maintained as well for depressive personality pattern compared with major depression and dysthymia between the end of the EMDR treatment and the follow-up measurement at the end of the research study.

5.6.4 Change in other clinical syndromes between last and follow-up measurement

The clinical syndromes under investigation between the last measurement at the end of the EMDR treatment and the follow-up measurement are post traumatic stress and anxiety.

These were measured using the MCMI-III clinical syndrome scales.

5.6.4.1 Kolmogorov-Smirnov test

The distribution of the change in other clinical syndromes between the last measurement at the end of EMDR treatment and the follow-up measurement at the end of the research study was analysed. The Kolmogorov-Smirnov test combined with the distribution of each clinical syndrome and a normal distribution overlay was used to test for normality. Variables not normally distributed were transformed to ensure normality.

The anxiety disorder scale could not be fully transformed to normality, but normality was accepted based on the visual distribution.

5.6.4.2 Paired t-test

A paired t-test was performed on other clinical syndromes that were normally distributed to determine if the average change in these clinical syndromes between the last measurement at the end of EMDR treatment and the follow-up measurement at the end of the study was significantly different.

Table 45. Paired t-test for significant change in other clinical syndromes between last and follow-up measurement.

Clinical syndromes	Degrees of Freedom	t-value	p-value
Anxiety Disorder	26	1.37	0.1814
Post Traumatic Stress Disorder	26	1.65	0.1107

The null hypothesis states that EMDR treatment does not lead to significant changes in MCMI-III scores for other clinical syndromes, post traumatic stress and anxiety, between the last measurement at the end of EMDR treatment and the follow-up measurement at the end of the research study.

The null hypothesis was not rejected for other clinical syndromes, post traumatic stress and anxiety, between the last measurement at the end of EMDR treatment and the follow-up measurement at the end of the research study. This means that the gains were maintained for other clinical syndromes, post traumatic stress and anxiety, between the last measurement at the end of EMDR treatment and the follow-up measurement at the end of the research study.

5.6.5 Change in severe clinical syndromes between last and follow-up measurement

Even though no participants in this research study had clinically significant bipolar (manic) disorder, thought disorder, delusional disorder, and alcohol and drug dependence, they did complete these scales on the MCMI-III. The change in severe clinical syndromes, bipolar (manic) disorder, thought disorder, delusional disorder, and alcohol and drug dependence, between the last measurement at the end of EMDR treatment and the measurement at the end of the research study, was analysed.

5.6.5.1 Kolmogorov-Smirnov test

The distribution of the change in the severe clinical syndromes between the last measurement at the end of EMDR treatment and the follow-up measurement at the end of the research was analysed. The Kolmogorov-Smirnov test combined with the distribution of each severe clinical syndromes and a normal distribution overlay was used to test for normality. Variables not normality distributed were transformed to ensure normality.

Table 46. Transformed variables on severe clinical syndromes between the last and follow-up measurement

Severe clinical syndromes	Transformation
Thought disorder	Square root
Delusional disorder	Square root
Alcohol dependence	Square root

5.6.5.2 Paired t-test

A paired t-test was performed on the severe clinical syndromes that were normally distributed to determine if the average change between the last and follow-up measurement was significantly different.

There was no significant change in the severe clinical syndromes, bipolar (manic) disorder, thought disorder, delusional disorder, and alcohol and drug dependence, between the last and the follow-up measurement. This suggests that any gains were maintained between the last measurement at the end of the EMDR treatment and the follow-up measurement at the end of the research.

Table 47. Paired t-test for significant change in severe clinical syndromes between the last and follow-up measurement

Severe clinical syndromes	Degrees of Freedom	t-value	p-value
Bipolar (manic)	26	0.66	0.5149
Thought disorder	26	1.50	0.1449
Delusional disorder	26	1.79	0.0858
Alcohol dependence	26	-0.72	0.4771
Drug dependence	26	-0.04	0.9654

The null hypothesis states that EMDR treatment does not lead to significant changes in MCMI-III scores for severe clinical syndromes, bipolar, thought disorder, delusional disorder, and alcohol and drug dependence, between the last measurement at the end of the EMDR treatment and the follow-up measurement at the end of the research.

The null hypothesis was not rejected for the severe clinical syndromes, thought disorder, delusional disorder, and alcohol and drug dependence, between the last measurement at the end of the EMDR treatment and the follow-up measurement at the end of the research. This means that the gains were maintained between the last measurement at the end of the EMDR treatment and the follow-up measurement at the end of the research.

5.6.6 Change in dissociation between last and follow-up measurement

The Dissociative Experience Scale (DES-II) was used to collect data for the measurement of dissociation. The last measurement was taken at the end of the EMDR treatment and the follow-up measurement was taken at the end of the research study.

5.6.6.1 Paired t-test

A paired t-test was performed on dissociation to determine if the average change between the last and follow-up measurement was significantly different.

Table 48. Paired t-test for significant change in dissociation between last and follow-up measurement

	Degrees of Freedom	t-value	p-value
Dissociation	26	-0.92	0.3641

The analysis shows that there was no significant change in dissociation between the last measurement at the end of the EMDR treatment and the follow-up measurement at the end of the research study.

The null hypothesis states that EMDR treatment does not lead to significant changes in DES-II scores for dissociation between the last measurement at the end of the EMDR treatment and the follow-up measurement at the end of the research study.

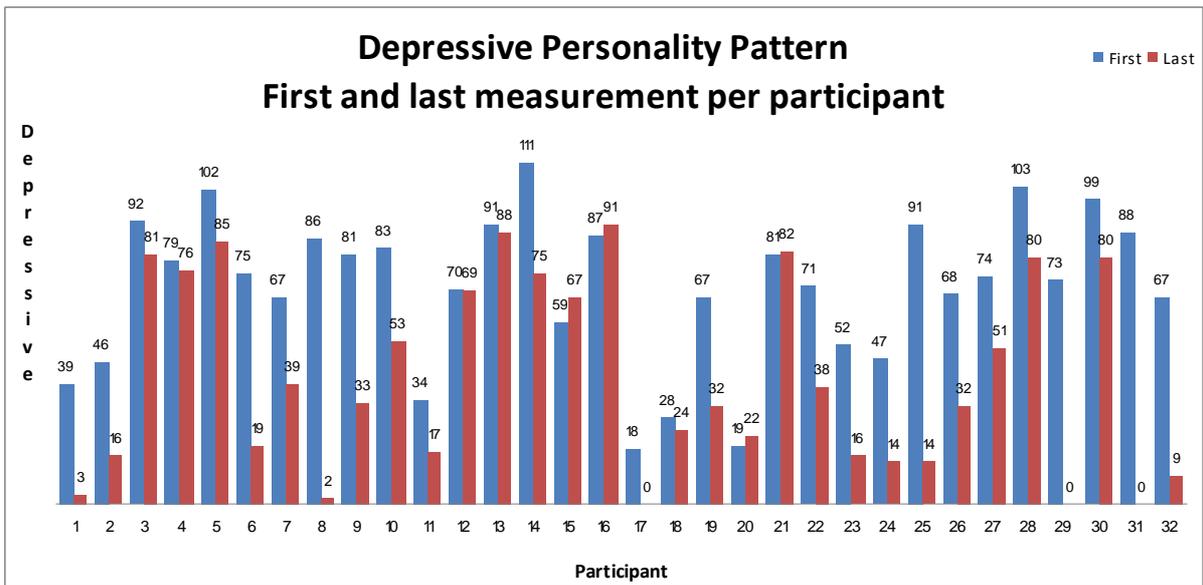
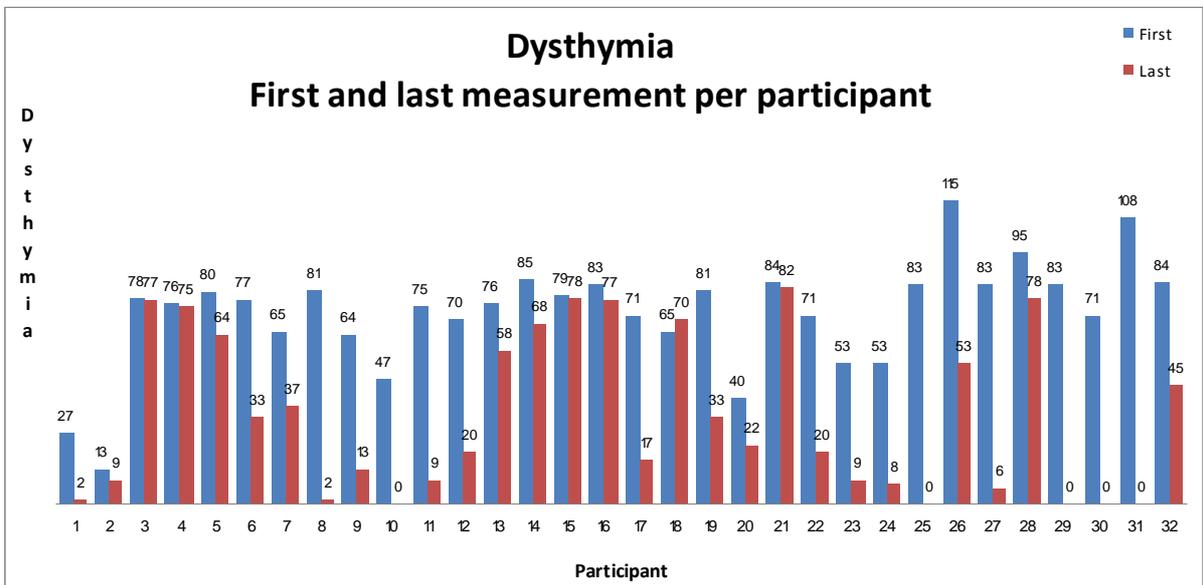
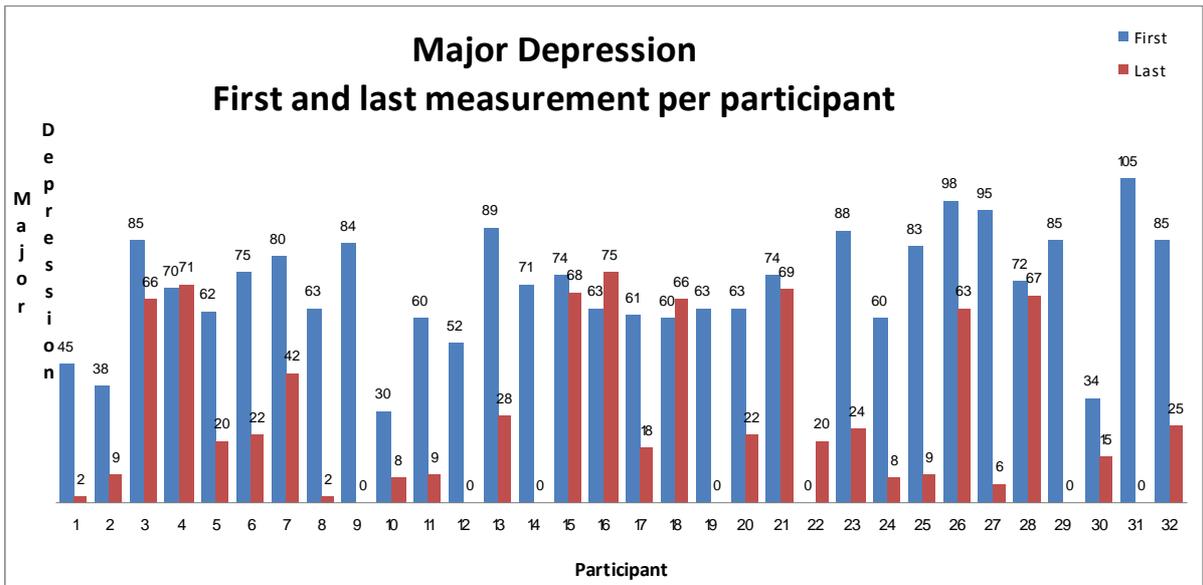
The null hypothesis was not rejected for dissociation between the last measurement at the end of the EMDR treatment and the follow-up measurement at the end of the research study. This means that the gains were maintained between the last measurement at the end of the EMDR treatment and the follow-up measurement at the end of the research study.

5.6.7 Association between depressive constructs between last and follow-up measurement

The association between the depressive constructs (major depression, dysthymia and depressive personality pattern) on the MCMI-III was analysed between the last measurement at the end of EMDR treatment and the follow-up measurement at the end of the research study.

5.6.7.1 Plots for depressive symptoms

Plots were performed to depict the scores obtained on the MCMI-III depressive scales; major depression, dysthymia and depressive personality pattern. The plots represent the scores obtained at the end of the EMDR treatment (represented in blue) versus the scores obtained at the follow-up measure at the end of research study (represented in red).



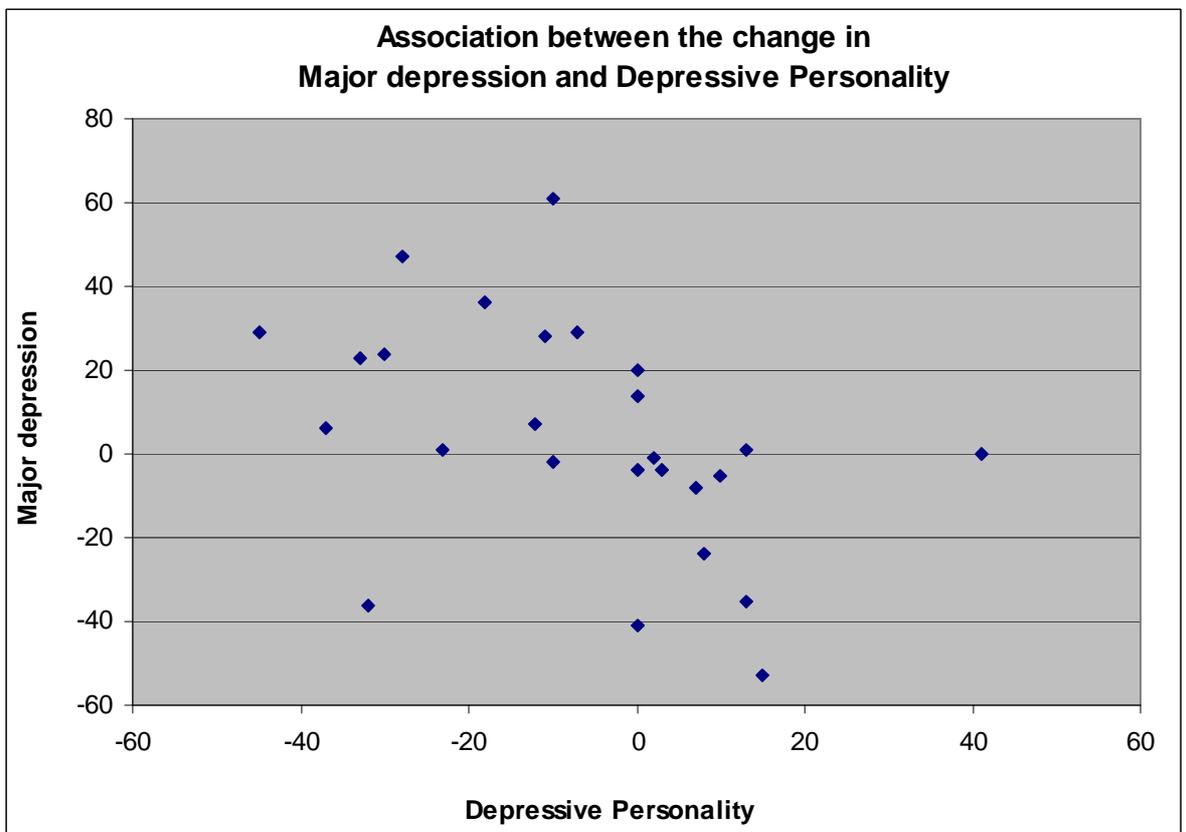
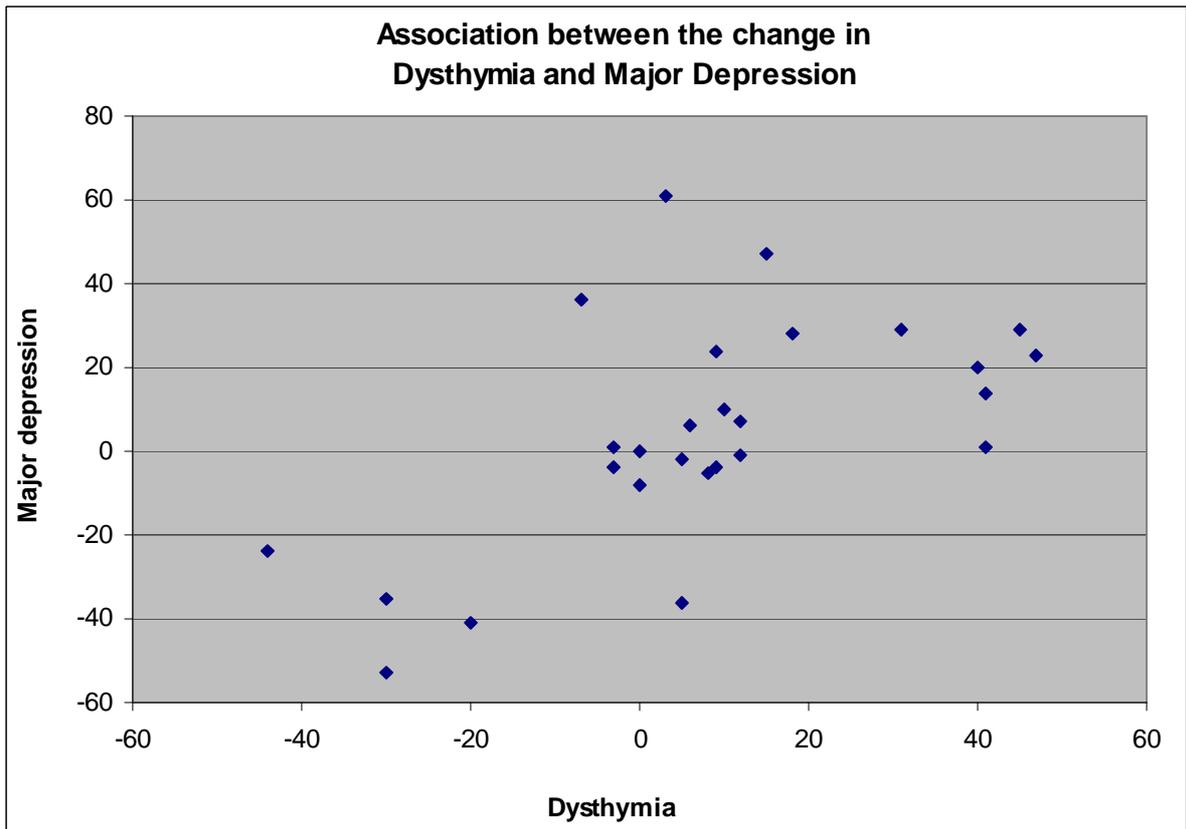
5.6.7.2 Spearman rank correlation analysis

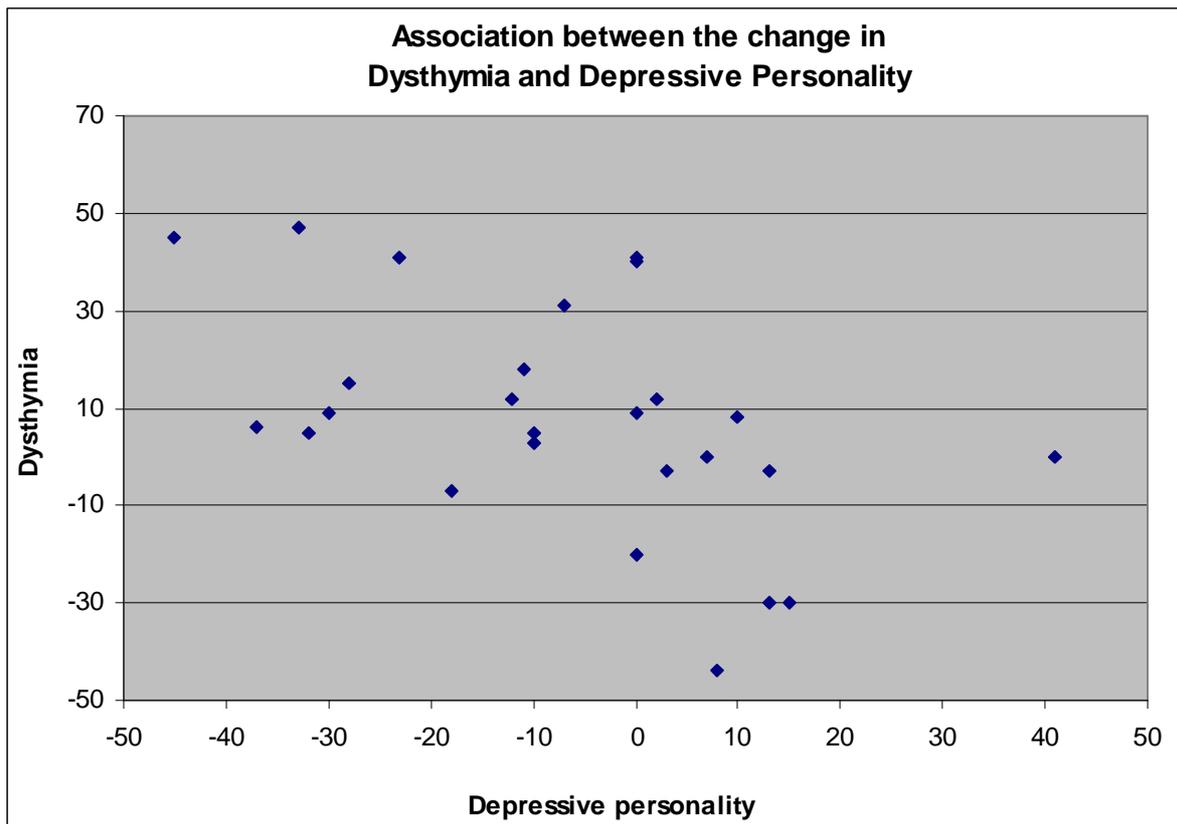
The correlation between depressive constructs, major depression, dysthymia, and depressive personality disorder, was tested by using the Spearman rank correlation coefficient and the associated p-value.

Table 49. Analysis of correlation of depressive constructs between the last and follow-up measurement

Depressive constructs	Statistic	Dysthymia	Major depression	Depressive personality
Dysthymia	Spearman correlation coefficient	1.0000	0.59406	0.56432
	p-value		0.0011	0.0022
Major depression	Spearman correlation coefficient	0.59406	1.0000	0.56183
	p-value	0.0011		0.0023
Depressive personality	Spearman correlation coefficient	0.56432	0.56183	1.0000
	p-value	0.0022	0.0023	

There is a significant positive correlation between the change in dysthymia and major depression (correlation coefficient 0.59406), dysthymia and depressive personality (correlation coefficient 0.56432), major depression and depressive personality (correlation coefficient 0.56183), between the last measurement at the end of the EMDR treatment and follow-up measurement at the end of the research study. The results suggest that there is moderate correlation between dysthymia and major depression, dysthymia and depressive personality, and major depression and depressive personality.





5.6.8 Association between depressive constructs and clinical syndromes between last and follow-up measurement

The association between the depressive constructs, major depression and dysthymia, and other clinical syndromes, post traumatic stress and anxiety, was analysed between the last measurement at the end of EMDR treatment and the follow-up measurement at the end of the research.

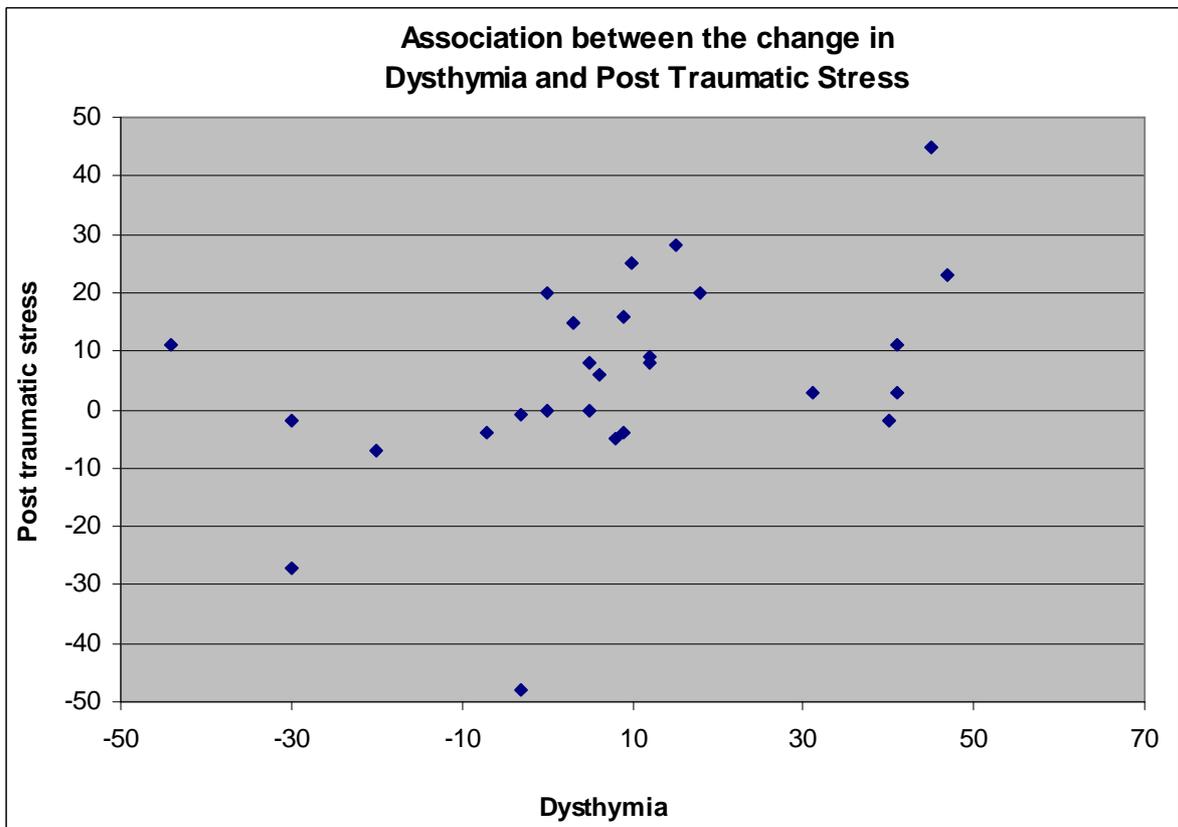
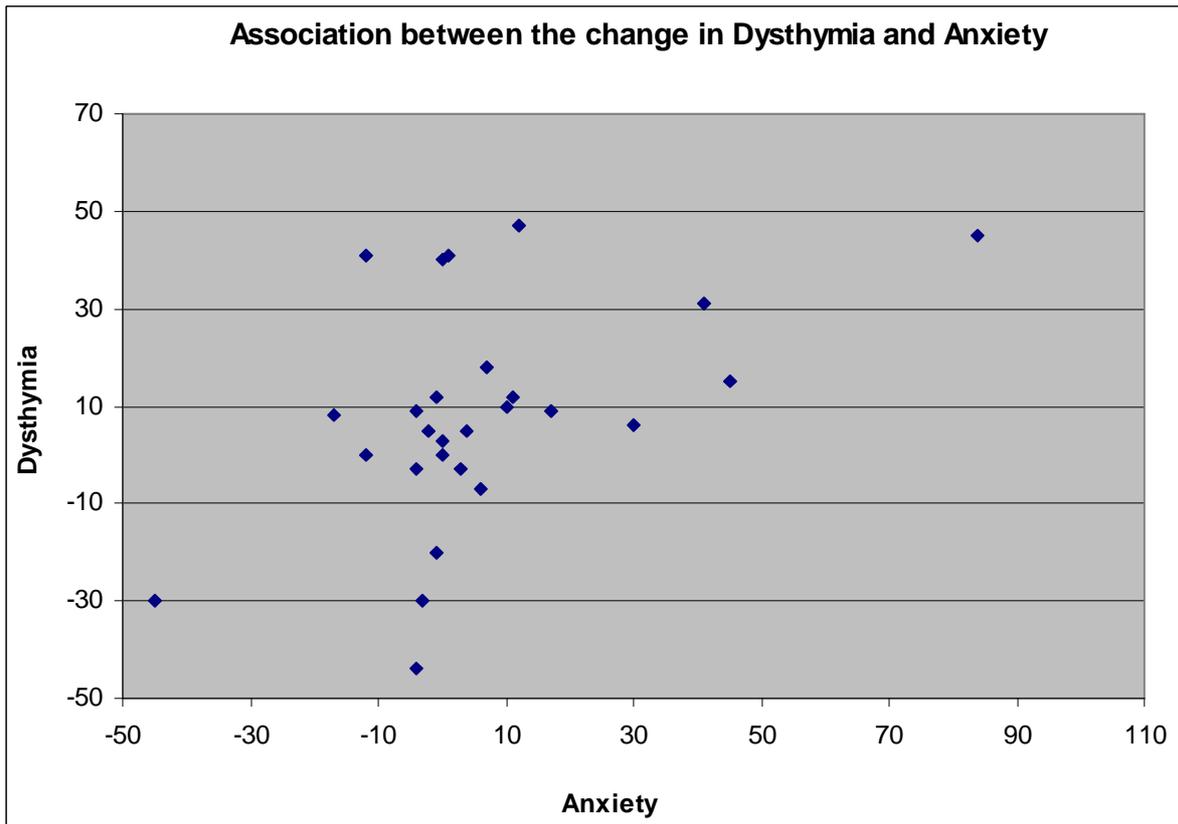
5.6.8.1 Spearman rank correlation analysis

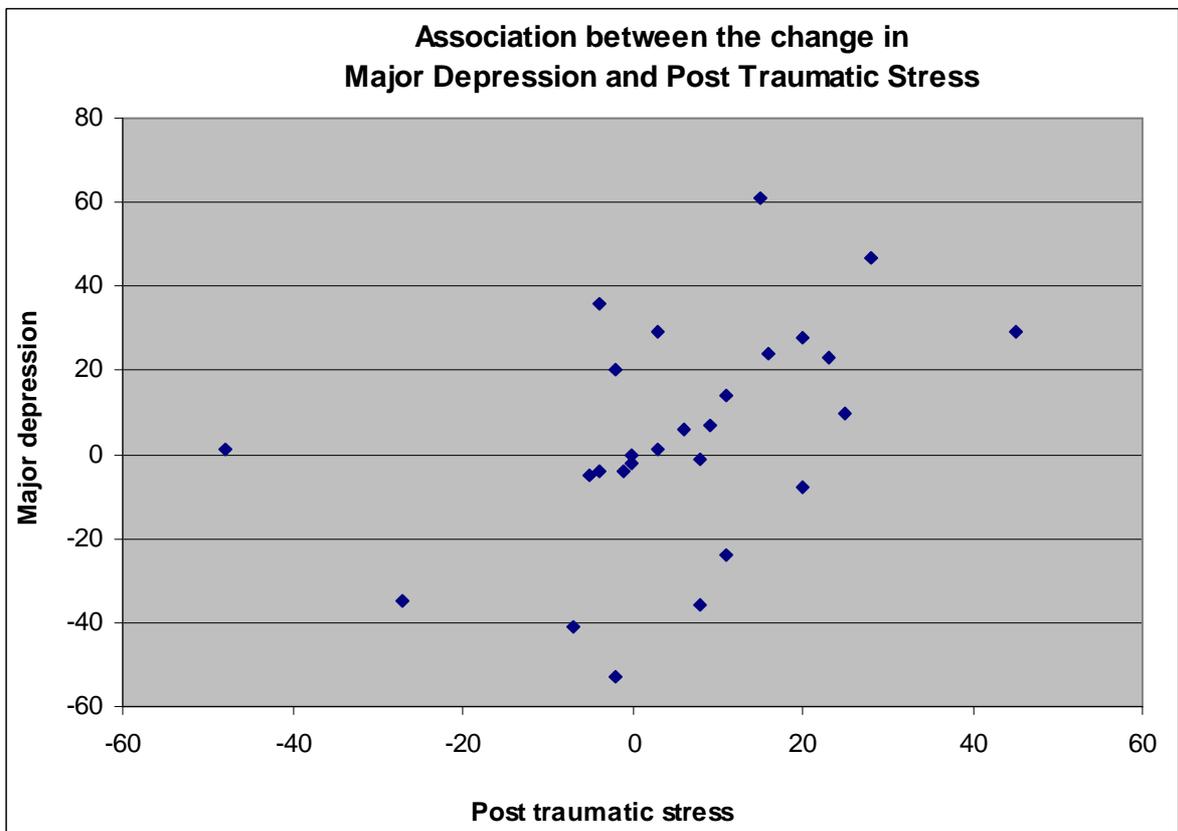
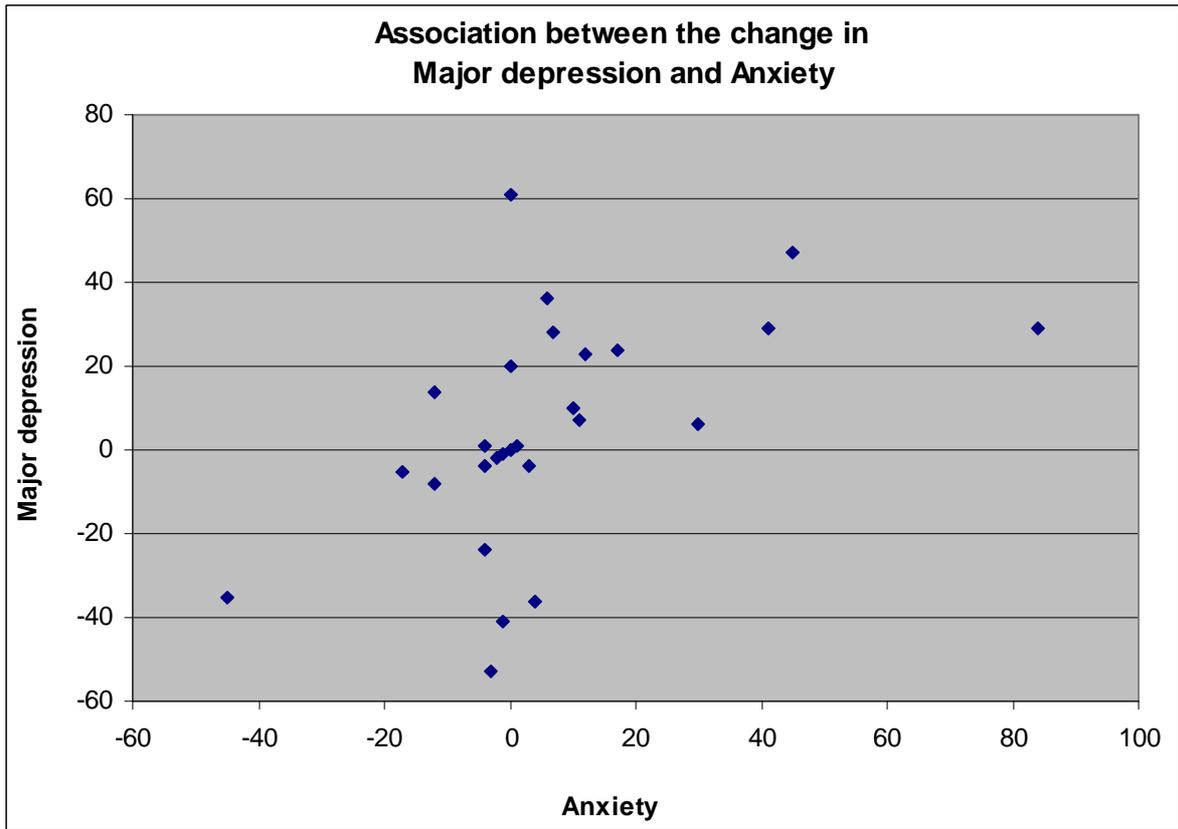
The correlation between depressive constructs, major depression and dysthymia, and clinical syndromes, post traumatic stress and anxiety, was tested by using the Spearman rank correlation coefficient and the associated p-value.

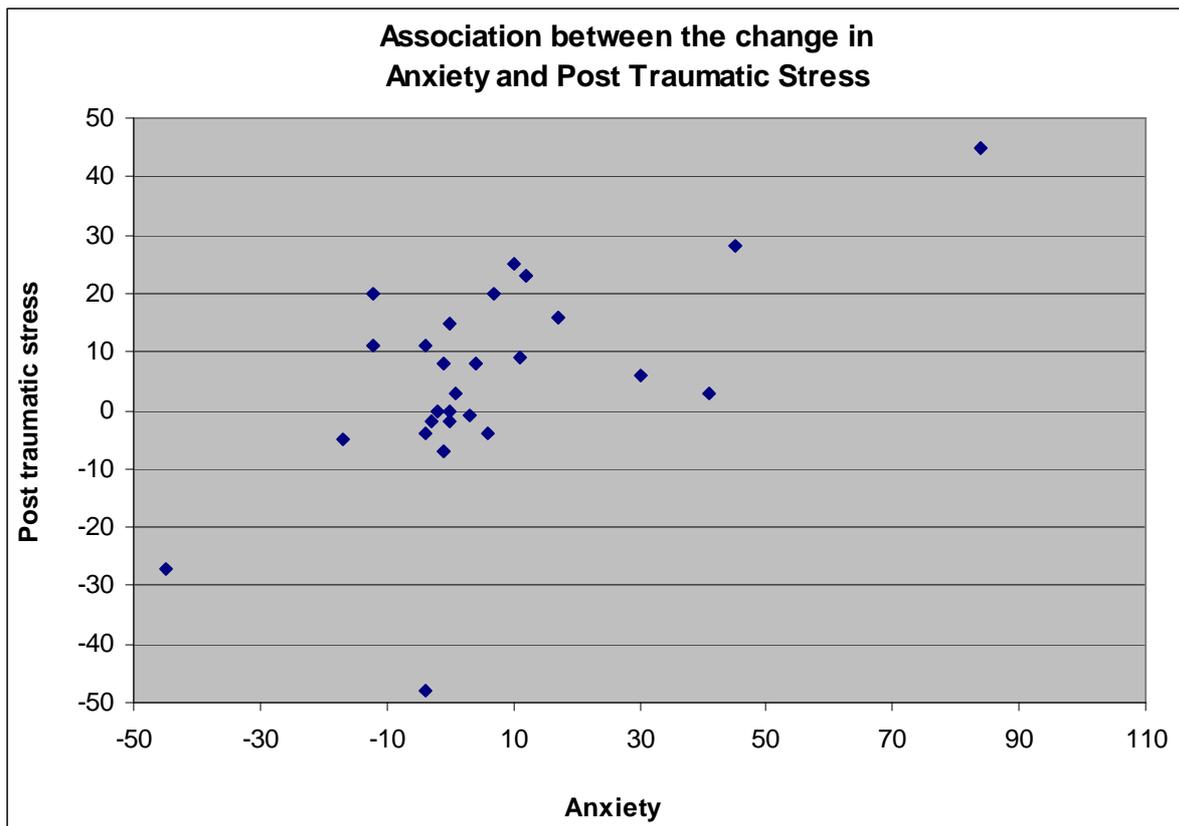
Table 50. Analysis of correlation between depressive constructs and clinical syndromes between last and follow-up measurement

Clinical constructs	Statistic	Anxiety	Dysthymia	Post traumatic stress	Major depression
Anxiety	Spearman correlation coefficient	1.0000	0.49594	0.5492	0.65759
	p-value		0.0085	0.003	0.0002
Dysthymia	Spearman correlation coefficient	0.49594	1.0000	0.52539	0.59401
	p-value	0.0085		0.0049	0.0011
Post traumatic stress	Spearman correlation coefficient	0.5492	0.52539	1.0000	0.50061
	p-value	0.003	0.0049		0.0078
Major depression	Spearman correlation coefficient	0.65759	0.59401	0.50061	1.0000
	p-value	0.0002	0.0011	0.0078	

There is a significant positive correlation between the change in anxiety and major depression (correlation coefficient 0.65759), dysthymia and major depression (correlation coefficient 0.59401), anxiety and post traumatic stress (correlation coefficient 0.5492), dysthymia and post traumatic stress (correlation coefficient 0.52539), post traumatic stress and major depression (correlation coefficient 0.50061), and anxiety and dysthymia (correlation coefficient 0.49594), between the last measurement at the end of EMDR treatment and the follow-up measurement at the end of the research study. There is a moderate correlation between anxiety and major depression, dysthymia and major depression, anxiety and post traumatic stress, and dysthymia and post traumatic stress.







5.7 Summary of findings of data analysis

With regard to the data analysis of the effect of EMDR treatment on clinical personality patterns on the MCMI-III after the treatment of one trauma, the results revealed that there was a significant change in the personality patterns, schizoid, avoidant, depressive, dependent, narcissistic, sadistic, compulsive, negativistic and masochistic, at the .01 level. However, the change in histrionic and antisocial personality pattern only tended towards significance (i.e., $p < .05$) after the treatment of one trauma.

Whilst there was a decrease in schizoid, avoidant, depressive, dependent, sadistic, negativistic and masochistic personality patterns, there was an increase in narcissistic and compulsive personality patterns after the EMDR treatment of one trauma. On the MCMI-III, an increase in narcissistic and compulsive personality pattern scores is rarely correlated with a

psychiatric condition, but rather it is positively associated with psychological health and an adaptive healthy personality style (Craig, 2008).

The data analysis between the first measurement before EMDR treatment and the last measurement at the end of the EMDR treatment revealed that there was a significant change in the clinical personality patterns, schizoid, avoidant, depressive, dependent, histrionic, narcissistic, sadistic, compulsive, negativistic and masochistic, at the .01 level. However, the change in antisocial personality pattern only tended towards significance (i.e., $p < .05$). Whilst there was a decrease in schizoid, avoidant, depressive, dependent, sadistic, negativistic and masochistic personality patterns, there was an increase in histrionic, narcissistic and compulsive personality patterns on the MCMI-III.

The data analysis between the first measurement before EMDR treatment and the follow-up measurement at the end of the study revealed that there was a significant change in the clinical personality patterns, avoidant, depressive, dependent, histrionic, narcissistic, antisocial, sadistic, negativistic and masochistic, at the .01 level. However, the change in schizoid and compulsive personality patterns only tended towards significance (i.e., $p < .05$). Whilst there was a decrease in avoidant, depressive, dependent, antisocial, sadistic, negativistic and masochistic personality patterns, there was an increase in histrionic and narcissistic personality pattern on the MCMI-III.

The results of the data analysis between the last measurement at the end of the EMDR treatment and the follow-up measurement at the end of the study revealed that there was no significant change in the clinical personality patterns, schizoid, avoidant, dependent, histrionic, narcissistic, antisocial, sadistic, compulsive, negativistic and masochistic, at the .01 level. However, the change in depressive personality pattern tended towards significance (i.e., $p < .05$), which means that the gains were not as well maintained for depressive personality compared to the other personality patterns.

The data analysis of the severe personality patterns on the MCMI-III revealed that there was a clinically significant decrease in schizotypal, borderline and paranoid personality patterns, between the first measurement before EMDR treatment and the measurement after the treatment of one trauma, between the first measurement before EMDR treatment and the last measurement at the at the end of EMDR treatment, and between the first measurement before EMDR treatment and the follow-up measurement at the end of the research study. The analysis of the data between the last measurement at the end of EMDR treatment and the follow-up measurement at the end of the research study revealed that the gains were maintained for all the severe personality patterns, schizotypal, borderline and paranoid. However, these results cannot be generalised to a population with clinically significant severe personality patterns, as the participants did not have clinically significant severe personality patterns before treatment.

The analysis of the data of the depressive constructs on the MCMI-III revealed that there was a clinically significant decrease in major depression, dysthymia and depressive personality pattern, between the first measurement before EMDR treatment and the measurement after the treatment of one trauma, between the first measurement before EMDR treatment and the last measurement at the end of EMDR treatment, and between the first measurement before EMDR treatment and the follow-up measurement at the end of the research study. The analysis between the last measurement at the end of EMDR treatment and the follow-up measurement at the end of the research study revealed that there was no significant change for major depression and dysthymia, which means that the gains were maintained. However, the change in depressive personality pattern tended towards significance (i.e., $p < .05$), which means that the gains were not as well maintained for depressive personality compared to major depression and dysthymia.

The data analysis of the other clinical syndromes on the MCMI-III revealed that there was a clinically significant decrease in post traumatic stress and anxiety, between the first measurement before EMDR treatment and the measurement after the treatment of one trauma, between the first measurement before EMDR treatment and the last measurement at the end of EMDR treatment, and between the first measurement before EMDR treatment and the follow-up measurement at the end of the research study. The analysis between the last measurement at the end of EMDR treatment and the follow-up measurement at the end of the research study revealed that the gains were maintained for both post traumatic stress and anxiety.

The analysis of the data of the severe clinical syndromes on the MCMI-III revealed that there was a clinically significant decrease in thought disorder, delusional disorder and alcohol dependence after the treatment of one trauma. However, there was no clinically significant change on the bipolar (manic) and drug dependence scales on the MCMI-III.

The data analysis between the first measurement before EMDR treatment and the last measurement at the end of EMDR treatment revealed that there was a clinically significant decrease in thought disorder and delusional disorder. However, while the change in bipolar (manic) scale on the MCMI-III was not clinically significant, the change on the alcohol and drug dependence scale tended towards significance (i.e., $p < .05$).

The data analysis between the first measurement before EMDR treatment and the follow-up measurement at the end of study revealed that there was a clinically significant decrease in thought disorder. However, while the change in bipolar, delusional disorder and drug dependence scale on the MCMI-III was not clinically significant, the change on the alcohol dependence scale tended towards significance (i.e., $p < .05$).

The data analysis between the last measurement at the end of the EMDR treatment and the follow-up measurement at the end of study revealed that there was no clinically significant change in thought disorder, delusional disorder, bipolar (manic), and alcohol and drug dependence. The results of this analysis cannot be generalised to a population with clinically significant severe clinical syndromes, as the participants did not have clinically significant severe clinical syndromes before treatment.

With regard to the analysis of the effect of EMDR treatment on dissociation on the DES-II, the results showed that there was a significant decrease in dissociation between the first measurement before EMDR treatment and the measurement after the treatment of one trauma, between the first measurement before EMDR treatment and the last measurement at the end of the EMDR treatment, and between the last measurement at the end of the EMDR treatment and the follow-up measurement at the end of the study. The analysis between the last measurement at the end of EMDR treatment and the follow-up measurement at the end of the research study revealed that the gains were maintained for dissociation.

Chapter 6: Discussion of results

This chapter discusses the findings of the research study. Firstly, the limitations of this study will briefly be discussed. Then the effects of EMDR on personality patterns will be discussed in three ways: the effects on clinical personality patterns, the effects on compulsive, histrionic and narcissistic personality pattern, and the effects of EMDR on different configurations of personality patterns. The results of the analysis of the severe personality patterns, schizotypal, borderline and paranoid, will then be discussed. The chapter will then go onto discuss the effects of EMDR on the depressive constructs, namely major depression, dysthymia and depressive personality pattern. Thereafter the discussion will look at the effects of EMDR on other clinical syndromes, namely post traumatic stress and anxiety. The results of the severe clinical syndromes, thought disorder, bipolar, and delusional disorder, and the two dependence disorders, alcohol and drug dependence, will also be discussed. Finally, the effects of effects of EMDR on dissociation and the number of EMDR treatment sessions will be discussed.

6.1 Limitations of the study

One of the key limitations to this study is sample size. Whilst the researcher received authority from the ethics committee to obtain a sample of up to 80 participants, a lack of resources hampered this endeavour. Of the 104 potential participants, only 40 fell within the treatment criteria and consented to participate. The amount of time needed to administer and refine the population sample was considerable. Another difficulty was obtaining sufficient participants who completed the full standardised EMDR protocol treatment and assessment as outlined in the research design. Out of the 40 participants who consented to undergo the treatment, only 32 participants completed the full standardised treatment and assessment protocol. A considerable amount of time was spent doing EMDR treatment with certain

participants; only to find that their data could not be used for analysis. In one instance, a participant invalidated his last assessment after the completion of his EMDR treatment, by randomly completing his last MCMI-III. Another participant underwent the full EMDR treatment for four traumas; yet the data of the assessment could not be used because there were no clear cut-off points to do measurements after the treatment of each trauma, due to the fact that the reprocessing of the traumatic memories became intertwined with one another. This case will be discussed as a case study under the findings of depressive symptoms.

Other limitation of this research study includes a lack of a blind independent assessor due to a lack of resources. The effects of this were minimised by the use of a self-reporting assessment. However, a self-reporting instrument together with a structured diagnostic interview assessment is seen as a better way of assessing post traumatic stress (Tarrier, 2001). Another limitation of this study compared to the Revised Gold Standard Scale (Maxfield & Hyer, 2002) is that the researcher was the only clinician in the study. In addition, the fidelity of the researcher was only checked by one video tape, which may be seen as less than optimal. This research study was also not compared to any other form of psychological therapy and was not a randomised control study.

Some may view the method of follow-up used in this study as a limitation, as the follow-up measurement in the study was conducted at the end of the study, which ranged from seven- to 36-months after the end of the EMDR treatment compared to regular intervals such as at three-month (Marcus, et al, 1997; Rothbaum, 1997; Carlson, et al, 1998; Scheck, et al, 1998; Devilly, et al, 1999; Edmonds, et al, 1999; Ironson, et al, 2002; Lee, et al, 2002), six-month (Marcus, et al, 2004; Rothbaum, et al, 2005; van der Kolk, 2007), nine-month (Sprang, 2001); 15-month (Wilson, et al, 1997; Power, et al, 2002), and five year follow-up (Pitman, et al, 1996). Doing the follow-up measurement at the end of this research provided

data over a period of time from six-months to 36-months. This provided an indication of whether the gains were maintained continuously over a period of time.

However, a strength of this study is that the researcher had completed the accredited EMDR training and was accredited in EMDR treatment early in the research study. Also the measurements were undertaken with robust psychometric assessment tools. The research also had definite exclusion and inclusion criteria. The treatment also followed a standardised full EMDR treatment protocol.

6.2 Discussion of effects of EMDR on clinical personality patterns

6.2.1 Effects of EMDR on clinical personality patterns

The effects of EMDR on clinical personality patterns will be discussed in this section. The clinical personality patterns under discussion in this section are schizoid, avoidant, depressive, dependent, histrionic, narcissistic, antisocial, sadistic, compulsive, negativistic and masochistic, on the MCMI-III. These results are unique as to date there have been no empirical studies into the effect of EMDR treatment on clinical personality patterns as measured on the MCMI-III.

In this research study, the term schizoid personality pattern refers to the schizoid personality scale on the MCMI-III. The paired t-test for significant change suggested that there was a significant decrease in the schizoid personality pattern for all the participants between the first measurement before EMDR treatment and the measurement after the treatment of one trauma, and between the first measurement before EMDR treatment and the measurement at the end of the EMDR treatment. However, whilst there was no significant change or reduction in schizoid personality pattern at the .01 level between the measurement before EMDR treatment and the follow-up measurement at the end of the study, the obtained t-value tended towards significance (i.e., $p < .05$).

Seven of the 32 participants, or 22% of participants, had clinically significant schizoid personality pattern (≥ 75 on the MCMI-III schizoid scale) before EMDR treatment. After the treatment of one trauma, three of these seven participants no longer had a clinically significant schizoid personality pattern (<75 on the MCMI-III schizoid personality scale). Five of these seven participants reported a clinically significant schizoid personality pattern, at the end of EMDR treatment and at follow-up. This suggests that out of the seven participants who had a clinically significant schizoid personality pattern before treatment, only two participants no longer had a clinically significant schizoid personality pattern at the end of the study. This means that 29% of the participants with a clinically significant schizoid personality pattern before EMDR treatment no longer had a clinically significant schizoid personality pattern at the end of the study. However, at the follow-up measurement four additional participants, or 57% of these participants, reported a clinically significant schizoid personality pattern at the end of the study but these did not have a clinically significant schizoid personality pattern before EMDR treatment. Scores on the schizoid personality scale before EMDR treatment for two of these participants were 73, and for one participant it was 68, which were very close to clinically significant to begin with. For one participant, her schizoid personality pattern increased with EMDR treatment, as she found that she was unable to reconcile the guilt she felt following the termination of her first baby. These results seem to suggest that the schizoid personality pattern may be quite resistant to EMDR treatment, and this would have to be investigated in future research.

The schizoid personality pattern had the lowest reduction in symptoms with EMDR treatment compared to all the other personality patterns under investigation. People with schizoid personality often have feelings of detachment and emptiness, tend to suppress their emotions and withdraw, and appear introverted with a flat affect. This personality type has severe relationship deficits as they require little affection, lack warmth and prefer a solitary

life (Millon, 1997; Craig, 2008). According to Shapiro (2007), a comprehensive psychological reorganisation may occur as a result of the effective processing of critical early life events using EMDR, which may be reflected in changes in characteristics of personality. The results for the schizoid personality pattern seems inconsistent with this assumption of Shapiro (2007) as only 29% of the participants no longer reported a clinically significant schizoid personality pattern at the end of treatment and 29% maintained these gains. In addition, four more participants who reported clinically significant schizoid personality pattern at the end of the study did not have clinically significant schizoid before EMDR treatment. These results also seems inconsistent with the findings of Edmond et al. (2004, p. 260) who reported changes on a 'deeper, more profound level' with EMDR treatment.

In this research study, the term avoidant personality pattern refers to the avoidant personality scale on the MCMI-III. The paired t-test for significant change suggested that there was a significant decrease in the avoidant personality pattern for all the participants between the measurement before EMDR treatment and the follow-up measure at the end of the research study. However, only 13 of the 32 participants in the study, or 41% of the participants, had a clinically significant avoidant personality pattern (≥ 75 on the MCMI-III avoidant personality scale) before EMDR treatment. Seven of these 13 participants no longer had clinically significant avoidant personality pattern (<75) after the treatment of the first trauma. At the end of EMDR treatment, nine of these 13 participants no longer had a clinically significant avoidant personality pattern. These gains were maintained by five of the 13 participants at the follow-up measure, which suggest that 38% of participants with a clinically significant avoidant personality pattern before EMDR treatment no longer had a clinically significant avoidant personality pattern (<75) at the end of the study.

The avoidant personality pattern revealed a reduction in symptoms with EMDR treatment. People with avoidant personality pattern tend to avoid social situations, as they experience feelings of rejection, worthlessness and self-blame. They are keen to relate socially but expect criticism, disapproval and depreciation, so tend to withdrawal or reduce social contact (Millon, 1997; Craig, 2008). According to Shapiro (2007), a comprehensive psychological reorganisation may occur as a result of the effective processing of critical early life using EMDR, which may be reflected in changes of personality characteristics. The results of the avoidant personality pattern is reasonably consistent with this assumption of Shapiro (2007) as 59% of the participants no longer reported a clinically significant avoidant personality pattern at the end of treatment and 38% maintained these gains at follow-up. Therefore 38% of these participants did not report a clinically significant avoidant personality pattern at follow-up, implying there was a decrease in the tendency to expect disapproval and feel worthless and rejected. The researcher also postulates that these participants would be less likely to avoid or withdrawal from social situations after EMDR treatment, which would be consistent with the findings of Edmond et al. (2004, p. 260) who reported changes on a 'deeper, more profound level', with EMDR treatment.

The term depressive personality pattern in this research study refers to the depressive personality scale on the MCMI-III. The paired t-test for significant change suggested that there was a significant decrease in the depressive personality pattern for all the participants between the measurement before EMDR treatment and after the treatment of one trauma, between the measurement before EMDR treatment and at the end of EMDR treatment, and between the measurement before EMDR treatment and the follow-up measurement at the end of the research study. However, whilst there was no significant change in depressive personality pattern at the .01 level between the measurement at the end of EMDR treatment

and the follow-up measurement at the end of the study, the obtained t-value tended towards significance (i.e., $p < .05$). This means that the gains achieved were not well maintained.

Only 15 of the 32 participants, or 47% of the participants, had a clinically significant depressive personality pattern (≥ 75 on the MCMI-III depressive scale) before EMDR treatment. After the EMDR treatment of the first trauma, five of these 15 participants no longer had a clinically significant score on the depressive personality scale. At the end of treatment, six of these 15 participants no longer had a clinically significant score on the depressive personality scale. At the follow-up measure, only five of the 15 participants maintained their gains and did not have a clinically significant depressive personality pattern. This means that only 33% of participants who had a clinically significant score on the depressive personality scale before EMDR treatment, no longer had a clinically significant depressive personality pattern at the end of the research study.

Out of all the personality patterns, the depressive personality pattern revealed the second lowest reduction in symptoms with EMDR treatment. People with depressive personality pattern often have feelings of failure, inadequacy, pessimism, guilt, emptiness, anhedonia, and recurrent sadness. They tend to worry excessively, be overly dependent on others and often make others feel guilty around them because they are quite hard to please. Their pessimism leads to self-defeating behaviour as they feel it is futile to make improvements in themselves and in their relationships (Millon, 1997; Craig, 2008). According to Shapiro (2007), a comprehensive psychological reorganisation may occur as a result of the effective processing of critical early life using EMDR, which may be reflected in changes in characteristics of personality. The results for the depressive personality pattern seems inconsistent with this assumption of Shapiro (2007) as only 33% of participants with clinically significant depressive personality pattern before EMDR treatment no longer reported a clinically significant depressive personality pattern at the follow-up measurement

at the end of the study. The researcher postulates that at the end of the study 33% of participants with depressive personality pattern experienced less feelings of failure, inadequacy, pessimism, guilt, emptiness, anhedonia, and recurrent sadness. The results of the depressive personality pattern also does not seem consistent with the findings of Edmond et al. (2004, p. 260) who reported changes on a 'deeper, more profound level' with EMDR treatment, compared to the other personality patterns in this study. More research in the future will be needed to verify these results.

In this research study, the term dependent personality pattern refers to the dependent personality scale on the MCMI-III. The paired t-test for significant change suggested that there was a significant decrease in the dependent personality pattern for all the participants between the measurement before EMDR treatment and the follow-up measure at the end of the research study. However, only 17 of the 32 participants in the study, or 53% of the participants, had a clinically significant dependent personality pattern (≥ 75 on the MCMI-III dependent personality scale) before EMDR treatment. Nine of these 17 participants no longer had a clinically significant dependent personality pattern (<75) after the treatment of one trauma. At the end of EMDR treatment, 13 of these 17 participants no longer had a clinically significant dependent personality pattern. These gains were maintained by all 13 of the 17 participants at the follow-up measurement at the end of the study. This suggests that 76% of participants with a clinically significant dependent personality pattern before EMDR treatment no longer had a clinically significant dependent personality pattern (<75) at the end of the study. However, three participants who did not have a clinically significant dependent personality pattern before EMDR treatment reported a clinically significant dependent personality pattern at the end of the study (≥ 75). One of these was the combat veteran and the other was the participant who reported the most childhood trauma, and both of these did

not have significant decreases in their overall symptoms. The third participant was one of the youngest participants who had been assaulted.

The dependent personality pattern revealed the greatest reduction in symptoms with EMDR treatment compared to all the other personality patterns. People with dependent personality need to be nurtured so look for people to take care of them and tend to be overly compliant to avoid abandonment (Millon, 1997; Craig, 2008). They tend to be submissive, passive, lack confidence, lack autonomy, and have feelings of insecurity and fears of being abandoned. This personality type tries to avoid conflict, so tends to pacify others (Millon, 1997; Craig, 2008). According to Shapiro (2007), a comprehensive psychological reorganisation may occur as a result of the effective processing of critical early life using EMDR and this may be reflected in changes in characteristics of personality. The results of the dependent personality pattern in this study is particularly consistent with this assumption of Shapiro (2007) as 76% of the participants no longer reported a clinically significant dependent personality pattern at the end of the study and therefore no longer felt the need to be looked after and be overly compliant to avoid abandonment. These participants also reported feeling less submissive and passive, and feeling more confident and autonomous. The results for the dependent personality pattern is also consistent with the findings of Edmond et al. (2004, p. 260) who reported changes on a 'deeper, more profound level', with EMDR treatment.

The term negativistic personality pattern in this research study refers to the negativistic (passive-aggressive) personality scale on the MCMI-III. The paired t-test for significant change suggested that there was a significant decrease in the negativistic personality pattern for all the participants between the measurement before EMDR treatment and the follow-up measure at the end of the research study. However, only 13 of the 32

participants, or 41% of the participants, had a clinically significant negativistic personality pattern (≥ 75 on the MCMI-III negativistic scale) before EMDR treatment. After the EMDR treatment of one trauma, seven of these 13 participants no longer had a clinically significant score on the negativistic personality scale. At the end of EMDR treatment, ten of these 13 participants (or 77% of these participants) no longer had a clinically significant score on the negativistic personality scale (<75). At the follow-up measure, only six of the 13 participants maintained their gains and did not have a clinically significant negativistic personality pattern (<75). This suggests that 46% of participants who had a clinically significant score on the negativistic personality scale before EMDR treatment no longer had a clinically significant negativistic personality pattern at the end of the research study.

The negativistic personality pattern revealed a considerable reduction in symptoms with EMDR treatment compared to the other personality patterns. People with negativistic personality pattern tend to be impulsive, hostile, irritable, sceptical, disgruntled, petulant and disillusioned. This type of personality suggests a serious psychiatric disorder with a loss of control over emotions, especially anger, together with cruel behaviours (Millon, 1997; Craig, 2008). Shapiro (2007) postulated that a comprehensive psychological reorganisation may occur as a result of the effective processing of critical early life using EMDR, which may be reflected in changes of personality characteristics. The results of the negativistic personality pattern is reasonably consistent with the assumption of Shapiro (2007) that a psychological reorganisation occurs that effects personality characteristics as 77% of the participants no longer reported a clinically significant negativistic personality pattern at the end of treatment and 46% maintained these gains at the follow-up measurement at the end of the study. The results suggests there was a decrease in the tendency to be impulsive, hostile, irritable, sceptical, disgruntled, petulant and disillusioned in these participants who no longer had clinically significant negativistic personality disorder at the end of the study. The researcher

also assumes that these participants would have more control over their emotions compared to before the EMDR treatment, which would be consistent with the findings of Edmond et al. (2004, p. 260) who reported changes on a 'deeper, more profound level', with EMDR treatment.

In this research study, the term masochistic personality pattern refers to the masochistic (self-defeating) personality scale on the MCMI-III. The paired t-test for significant change suggested that there was a significant decrease in the masochistic personality pattern for all the participants between the measurement before EMDR treatment and the follow-up measure at the end of the research study. However, only 16 of the 32 participants in the study, or 50% of the participants, had a clinically significant masochistic personality pattern (≥ 75 on the MCMI-III masochistic personality scale) before EMDR treatment. Nine of these 16 participants, or 56% of these participants, no longer had a clinically significant masochistic personality pattern (<75) after the treatment of one trauma. At the end of EMDR treatment, 12 of these 16 participants, or 75% of these participants, no longer had a clinically significant masochistic personality pattern. Nine of the 14 participants who attended the follow-up measurement, no longer had a clinically significant masochistic personality pattern. This means that 64% of participants with a clinically significant masochistic personality pattern before EMDR treatment no longer had a clinically significant masochistic personality pattern (<75) at the end of the study.

The masochistic personality pattern revealed the second greatest reduction in symptoms with EMDR treatment compared to the other personality patterns. People with masochistic (self-defeating) often display martyr-like behaviour and allow themselves to be dominated. They often seek relationships in which they can feel secure but inferior as they feel like they deserve to suffer. They seek out affection in a dominant relationship but may be

victimised (Millon, 1997; Craig, 2008). According to Shapiro (2007), a comprehensive psychological reorganisation may occur as a result of the effective processing of critical early life using EMDR, which may be reflected in changes in characteristics of personality. The results of the masochistic personality pattern in this study is consistent with this assumption of Shapiro (2007) as 64% of the participants no longer reported a clinically significant masochistic personality pattern at the follow-up measurement at the end of the study. This means that at the end of the study 64% of participants with masochistic personality pattern no longer felt they deserved to suffer and therefore would tend not to engage in martyr-like behaviour and seek out people who could dominate and victimise them. The results of the masochistic personality pattern is also consistent with the findings of Edmond et al. (2004, p. 260) who reported changes on a 'deeper, more profound level', with EMDR treatment.

The term sadistic personality pattern in this research study refers to the sadistic (aggressive) personality scale on the MCMI-III. The paired t-test for significant change suggested that there was a significant decrease in the sadistic personality pattern for all the participants between the measurement before EMDR treatment and the follow-up measure at the end of the research study. However, only two of the 32 participants, or 6% of the participants, had a clinically significant sadistic personality pattern (≥ 75 on the MCMI-III sadistic scale). After the EMDR treatment of one trauma, both participants no longer had a clinically significant score on the sadistic personality scale (<75). These results were maintained at the end of treatment and at the follow-up measurement at the end of the study. While this may suggest 100% of participants may experience a clinically significant reduction in their sadistic personality pattern with EMDR treatment, these results cannot be generalised because the sample is too small to draw this conclusion. This is demonstrated by the fact that at the end of the research study another participant had a clinically significant score on the

sadistic personality scale (=75). However, this participant had been in a severe road traffic accident two months before the end of the research study, which may have influenced her follow-up measurement at the end of the study.

The two participants with sadistic personality pattern experienced a significant reduction in these symptoms with EMDR treatment. People with sadistic (aggressive) personality pattern tend to be controlling, aggressive, intimidating, antagonistic, disagreeable, arrogant, and hostile with explosive outbursts and use brute force when angered (Millon, 1997; Craig, 2008). Shapiro (2007) postulated that a comprehensive psychological reorganisation may occur as a result of the effective processing of critical early life events using EMDR, which may be reflected in changes of personality. The results of the sadistic personality pattern seems consistent with this assumption of Shapiro (2007) as both participants no longer reported clinically significant sadistic personality pattern at the end of the study. These two participants therefore reported being less controlling, aggressive, intimidating, antagonistic, disagreeable, arrogant and hostile. However, these results cannot be generalised because of the small sample size and will need to be confirmed in future research.

In this research study, the term antisocial personality pattern refers to the antisocial personality scale on the MCMI-III. Whilst there was no significant change or reduction in antisocial personality pattern at the .01 level between the measurement before EMDR treatment and the measurement after the treatment of one trauma, and between the measurement before EMDR treatment and the measurement at the end of EMDR treatment, the obtained t-value tended towards significance (i.e., $p < .05$). However, the paired t-test for significant change suggested that there was a significant decrease in the antisocial personality

pattern for all the participants between the first measurement before EMDR treatment and the follow-up measurement at the end of the study.

Only one of the 32 participants in the study, or 3% of the participants, had a clinically significant antisocial personality pattern (≥ 75 on the MCMI-III antisocial personality scale) before EMDR treatment. The participant no longer had a clinically significant antisocial personality pattern (<75) after the treatment of one trauma using EMDR, and these gains were maintained at the end of treatment and at the follow-up measurement at the end of the study. However, at the end of the study another participant reported a clinically significant antisocial personality pattern. This participant had experienced bullying in childhood that included a severe assault.

The one participant with antisocial personality pattern experienced a significant reduction in these symptoms with EMDR treatment. People with antisocial personality pattern avoid being controlled or dominated and in response tend to dominate and intimidate. They tend to be aggressive, competitive, argumentative, vengeful and independent. They provoke people to instil fear, and acting out is their primary defence (Millon, 1997; Craig, 2008). According to Shapiro (2007), a comprehensive psychological reorganisation may occur as a result of the effective processing of critical early life events using EMDR, which may be reflected in changes of personality characteristics. The decrease in antisocial personality pattern on the MCMI-III for the one participant seems consistent with the assumption of Shapiro (2007), as the participant reported being less aggressive, competitive, argumentative, vengeful and independent. However, this result cannot be generalised because of the small sample size, and there was not a significant decrease in antisocial personality pattern after the EMDR treatment of one trauma and at the end of EMDR treatment for all participants. In addition, another participant reported a clinically significant antisocial

personality pattern after EMDR treatment yet not before EMDR treatment, which is not consistent with the assumption of Shapiro (2007).

In summary, the analysis of the clinical personality patterns on the MCMI-III after the treatment of one trauma with EMDR revealed that 53% of participants with dependent personality pattern on the MCMI-III no longer had a clinically significant score (>75); with the extent of the reduction in clinically significant scores for participants with other personality patterns being 56% for masochistic personality pattern, 54% for negativistic personality pattern, 54% for avoidant personality pattern, 33% for depressive personality pattern and 42% for schizoid personality pattern.

The analysis of the clinical personality patterns on the MCMI-III at the end of the treatment of multiple traumas using EMDR revealed that 76% of participants with dependent personality pattern on the MCMI-III no longer had a clinically significant score (>75); with the extent of the reduction in clinically significant scores for participants with other personality patterns being 75% for masochistic personality pattern, 77% for negativistic personality pattern, 69% for avoidant personality pattern, 40% for depressive personality pattern and 29% for schizoid personality pattern.

At the follow-up measurement at the end of the study, the analysis of the clinical personality patterns on the MCMI-III revealed that 76% of participants with dependent personality pattern on the MCMI-III no longer had a clinically significant score (>75); with the extent of the reduction in clinically significant scores for participants with other personality patterns being 64% for masochistic personality pattern, 46% for negativistic personality pattern, 38% for avoidant personality pattern, 33% for depressive personality pattern and 29% for schizoid personality pattern.

The analysis of the clinical personality patterns on the MCMI-III before EMDR treatment and at the follow-up measurement at the end of the study revealed that the dependent personality pattern experienced the greatest reduction in symptoms with EMDR treatment. Other personality patterns that experienced reductions in symptoms with EMDR treatment include the masochistic, negativistic, avoidant and sadistic personality patterns. On the other hand, the depressive and schizoid personality patterns experienced the least reduction in symptoms with EMDR treatment.

6.2.2 Effects of EMDR on compulsive, histrionic and narcissistic personality pattern

This research studied the effects of EMDR treatment on three personality patterns: compulsive, histrionic and narcissistic, on the MCMI-III. The analysis suggested an increase in these three personality patterns and the results are discussed.

The term compulsive personality pattern in this research refers to the compulsive personality pattern scale on the MCMI-III. The paired t-test for significant change suggested that there was a significant increase in the compulsive personality pattern for all the participants between the first measurement before EMDR treatment and the measurement after the treatment of one trauma, and between the first measurement before EMDR treatment and the measurement at the end of the EMDR treatment. However, whilst there was no significant change or increase in compulsive personality pattern at the .01 level between the first measurement before EMDR treatment and the follow-up measurement at the end of the study, the obtained t-value tended towards significance (i.e., $p < .05$).

Only two of the 32 participants, or 6% of the participants, had a clinically significant compulsive personality pattern (≥ 75 on the MCMI-III compulsive scale) before EMDR treatment. After the EMDR treatment of one trauma, both of these participants still had a clinically significant score on the compulsive personality scale on the MCMI-III and their

scores had actually increased. In addition, four other participants who did not have a clinically significant score on the compulsive personality pattern scale on the MCMI-III before EMDR treatment had a clinically significant score on the compulsive personality pattern scale after the treatment of one trauma using EMDR. At the end of treatment, six participants reported a clinically significant score on the compulsive personality pattern scale (≥ 75) on the MCMI-III. Four participants reported a clinically significant score on the compulsive personality scale (≥ 75) at the follow-up measurement at the end of the study. This means that at the end of the study 12% of the participants had a clinically significant compulsive personality pattern on the MCMI-III compared to 6% before EMDR treatment. In addition, 11 other participants also experienced an increase in their scores on the compulsive personality pattern scale on the MCMI-III, even though their final score was not clinically significant on the compulsive personality pattern scale at the end of the study.

Craig (2008) postulates that the compulsive personality scale on the MCMI-III should be seen to be measuring a personality style and not a personality disorder, because an elevated compulsive personality pattern score on the MCMI-III is rarely seen in a psychiatric population and is negatively correlated with the measures of psychiatric disturbance. In fact, this is often the highest scored scale in a nonclinical population, particularly in males, such as air force pilots in training, family practice residents, college students and first-year seminary students (Craig, 2008). Therefore, increases in the compulsive personality pattern scale in participants in this research study suggest considerable improvements towards mental health and a negative correlation to disturbance. Therefore increases in compulsive personality pattern in this study, even though the increases only tend towards significance at the .05 level, could be seen as consistent with the assumption by Shapiro (2007) that a comprehensive psychological reorganisation may occur as a result of the effective processing of critical early life using EMDR, which may be reflected in changes in characteristics of personality. In

addition, the increase in compulsive personality pattern is also consistent with the findings of Edmond et al. (2004, p. 260) who reported changes on a 'deeper, more profound level', with EMDR treatment.

In this research study, the term histrionic personality pattern refers to the histrionic personality pattern scale on the MCMI-III. Whilst there was no significant change or increase in histrionic personality pattern at the .01 level between the first measurement before EMDR treatment and the measurement after the treatment of one trauma, the obtained t-value tended towards significance (i.e., $p < .05$). The paired t-test for significant change also suggested that there was a significant increase in the histrionic personality pattern for all the participants between the first measurement before EMDR treatment and the measurement at the end of the EMDR treatment, and between the first measurement before EMDR treatment and the follow-up measurement at the end of the study.

Only one participant, or 3% of the participants, had a clinically significant histrionic personality pattern (≥ 75 on the MCMI-III histrionic scale) before EMDR treatment. After the EMDR treatment of one trauma, this participant still had a clinically significant score on the histrionic personality pattern scale on the MCMI-III and her scores actually increased. In addition, three other participants who did not have a clinically significant histrionic personality pattern before EMDR treatment had a clinically significant score on the histrionic personality pattern scale on the MCMI-III after the treatment of one trauma. At the end of EMDR treatment and at the end of the study, seven participants reported a clinically significant score on the histrionic personality pattern scale (≥ 75) on the MCMI-III. This means that at the end of the study 22% of the participants had a clinically significant score on the histrionic personality pattern scale on the MCMI-III compared to 3% before EMDR treatment. In addition, 15 other participants also experienced an increase in their scores on

the histrionic personality pattern scale on the MCMI-III, even though their final score was not clinically significant on the histrionic personality pattern scale at the end of the study.

According to Craig (2008), the elevated scores on the histrionic personality pattern scale on the MCMI-III correlates negatively with measures of emotional maladjustment and correlates positively with measures of mental health. In addition, the histrionic personality pattern scale is associated with more positive life events, less distress and fewer social problems (Craig, 2008). People who obtain elevated scores on the histrionic personality pattern scale include air force pilots in basic training and graduate students in psychology. Therefore, the increases in the histrionic personality pattern in participants in this research study seem to be positively correlated with participants feeling less distress and experiencing increased mental health. The increases in histrionic personality pattern could be seen as consistent with the assumption by Shapiro (2007) that a comprehensive psychological reorganisation may occur as a result of the effective processing of critical early life using EMDR, which may be reflected in changes in characteristics of personality. In addition, the increase in the histrionic personality pattern is also consistent with the findings of Edmond et al. (2004, p. 260) who reported changes on a 'deeper, more profound level', with EMDR.

In this research study, the term narcissistic personality pattern refers to the narcissistic personality pattern scale on the MCMI-III. The paired t-test for significant change suggested that there was a significant increase in the narcissistic personality pattern for all the participants between the measurement before EMDR treatment and the follow-up measurement at the end of the research study. However, only one participant, or 3% of the participants, had a clinically significant narcissistic personality pattern (≥ 75 on the MCMI-III narcissistic scale) before EMDR treatment. After the EMDR treatment of one trauma, this participant no longer had a clinically significant narcissistic personality pattern on the MCMI-

III. In addition, three other participants who did not have a clinically significant narcissistic personality pattern before EMDR treatment had a clinically significant scores on the narcissistic personality pattern scale on the MCMI-III after the treatment of one trauma. At the end of treatment, six participants reported a clinically significant score on the narcissistic personality pattern scale (≥ 75) on the MCMI-III. At the follow-up measurement at the end of the research study, eight participants reported a clinically significant score on the narcissistic personality pattern scale (≥ 75) on the MCMI-III. This means that at the end of the study 25% of the participants had a clinically significant narcissistic personality pattern compared to 3% before EMDR treatment. In addition, ten other participants also experienced an increase in their scores on the narcissistic personality pattern scale, even though their final score was not clinically significant on the narcissistic personality pattern scale on the MCMI-III at the end of the study.

According to Craig (2008), elevated scores on the narcissistic personality pattern scale on the MCMI-III can suggest either a healthy adaptive personality style or a personality disorder. Craig (2008) explains that a clinically significant score on the narcissistic personality pattern scale on the MCMI-III is rarely seen in psychiatric populations, with the exceptions of substance abuse disorders. Like the compulsive personality pattern scale on the MCMI-III, an elevated score on the narcissistic personality pattern scale is seen in nonclinical populations, such as air force pilots in basic training. Therefore, the elevations of the scores on the narcissistic personality pattern scale on the MCMI-III following EMDR treatment may be seen as a healthy adaptive personality style. Therefore the increase in narcissistic personality pattern in this study could be seen as consistent with the assumption by Shapiro (2007) that a comprehensive psychological reorganisation may occur as a result of the effective processing of critical early life using EMDR, which may be reflected in changes in characteristics of personality. In addition, the increase in narcissistic personality pattern is

also consistent with the findings of Edmond et al. (2004, p. 260) who reported changes on a 'deeper, more profound level', with EMDR treatment.

In summary, the analysis of the compulsive, histrionic and narcissistic personality patterns on the MCMI-III for all participants revealed a clinically significant increase in narcissistic and compulsive personality patterns between the first measurement before EMDR treatment and the measurement after the treatment of one trauma. Although the increase in histrionic personality pattern on the MCMI-III after the treatment of one trauma was not clinically significant at the .01 level, the obtained t-value tended towards significance (i.e., $p < .05$). However, the analysis revealed that there was a significant increase in narcissistic, histrionic and compulsive personality patterns at the end of EMDR treatment. The analysis between the measurement before EMDR treatment and the follow-up measurement at the end of the study revealed that there was a clinically significant increase in narcissistic and histrionic personality patterns on the MCMI-III, whilst the increase in compulsive personality pattern was not clinically significant at the .01 level but tended towards significant at the .05 level ($p < .05$).

On the MCMI-III, an elevated score on the compulsive, histrionic and narcissistic personality pattern scales are negatively correlated with psychiatric conditions and positively correlated with measures of mental health and a healthy adaptive personality styles, as elevated scores are seen in nonclinical populations such as air force pilots in basic training (Craig, 2008). The elevations in scores on the three personality patterns, compulsive, histrionic and narcissistic, on the MCMI-III, may be consistent with the assumption by Shapiro (2007) that a comprehensive psychological reorganisation may occur with EMDR treatment which may be reflected in changes in personality characteristics.

6.2.3 Effects of EMDR on the configuration of personality patterns

This research was designed to study the effects of EMDR treatment on personality patterns. One of the difficulties experienced in this research was the variety of personality patterns presented by the participants. The 32 participants generated 24 different personality configurations, which made it difficult to obtain results that can be compared and generalised to the clinical population. The different outcomes on the different personality configurations are outlined here-under and these may provide the impetus for further research studies.

Two male participants had clinically significant scores (≥ 75) on six personality scales, schizoid, avoidant, depressive, dependent, masochistic and negativistic, before treatment. After the treatment of one trauma using EMDR, the scores for these personality scales had reduced (except for one on the negativistic scale that had increased) but all the scores remained clinically significant (≥ 75). One of the participants went on to have treatment for a second trauma and the measurement at the end of EMDR treatment suggested that he no longer had clinically significant scores on the dependent, masochistic and negativistic personality scale. However, at his 28-month follow-up the only personality pattern that maintained the gains was his dependent personality pattern. The other participants had EMDR treatment for one trauma only and at follow-up the scores on all six personality scales were still clinically significant (≥ 75) at his 27-month follow-up. The participant that underwent treatment for one trauma had clinically significant anxiety and dysthymia before treatment but these scores reduced sufficiently so that these scales were not clinically significant after treatment. However, these gains were not maintained as his anxiety and dysthymia was clinically significant (≥ 75) at the 27-month follow-up. This participant reported that at the time of the follow-up measurement, he was moving out of his home as he was divorcing his wife. The researcher also postulates that the participant possibly had insufficient EMDR treatment. The other participant who had two traumas treated using

EMDR had clinically significant anxiety, dysthymia and post traumatic stress before treatment. After the treatment of two traumas, the scores reduced so that he no longer had clinically significant anxiety, dysthymia and post traumatic stress, and these gains were maintained at the 28-month follow-up.

One male participant had clinically significant scores (≥ 75) on five personality scales, schizoid, avoidant, depressive, dependent and negativistic, before treatment. The participant underwent EMDR treatment for one trauma only, which related to severe bullying as an adolescent and included a severe assault. At the end of treatment, the scores for these personality scales had reduced (except for one on the schizoid scale that had increased), but all the scores remained clinically significant (≥ 75). At his nine-month follow-up measure, the participant no longer had a clinically significant depressive personality pattern. However his scores on the schizoid, avoidant, dependent and negativistic scales remained clinically significant (≥ 75) at his nine-month follow-up. Before EMDR treatment, the participant had clinically significant anxiety, dysthymia and post traumatic stress disorder. While the participant still had clinically significant anxiety and dysthymia at the end of treatment, he no longer had clinically significant post traumatic stress disorder. At the nine-month follow-up the gains were maintained for post traumatic stress. While the symptoms for anxiety and dysthymia had reduced considerably compared to the first measurement, these were still clinically significant (≥ 75) at the nine-month follow-up.

One female participant had clinically significant scores (≥ 75) on five personality scales, avoidant, depressive, dependent, masochistic and negativistic, before treatment. The participant underwent EMDR treatment for one trauma only, relating to severe childhood bullying that included a severe assault. At the end of treatment the scores for these personality scales were no longer clinically significant except for one personality scale, namely depressive personality pattern (< 75). At her ten-month follow-up measure, the gains

were not maintained for the depressive personality pattern. However, at the 10-month follow-up measure, the avoidant and dependent personality patterns were no longer clinically significant (<75). Before EMDR treatment, the participant had a clinically significant anxiety disorder. However, at the end of treatment the participant no longer had clinically significant anxiety disorder (<75) and these gains were maintained at the end the ten-month follow-up measure. This participant related that a number of years previously she had undergone cognitive behaviour therapy, which helped her to function but she still had intense intrusive memories of the severe assault as a child. She was thrilled at how rapidly the EMDR reprocessed these disturbing memories and commented that she feels like she has finally left her childhood behind. The researcher believes that the cognitive behaviour therapy may have laid a foundation that influenced the rapid response to EMDR, as the participant only had four sessions of EMDR treatment.

One female participant had clinically significant scores (≥ 75) on four personality scales, schizoid, avoidant, dependent and masochistic, before EMDR treatment. The participant underwent treatment for traumas related to domestic violence by the same partner. At the end of treatment of the first trauma, the scores increased with the participant scoring significantly on six personality scales (≥ 75), namely schizoid, avoidant, depressive, dependent, masochistic and negativistic. However, after the treatment of the second trauma, the participant only had a clinically significant schizoid and dependent personality pattern (>75). All these personality gains were maintained at her 14-month follow-up, except for the avoidant personality pattern (≥ 75) which was clinically significant at the follow-up measurement. Before EMDR treatment, the participant had clinically significant anxiety, dysthymia, post traumatic stress disorder and major depression (≥ 75). After the treatment of the first trauma, the participant still had clinically significant anxiety, dysthymia, post traumatic stress disorder and major depression (≥ 75). However, at the end of treatment, she

only had clinically significant anxiety disorder (≥ 75) and these gains were maintained at the 14-month follow-up.

Three female participants had clinically significant scores (≥ 75) on the same four personality scales, avoidant, depressive, dependent and masochistic, before treatment. After the treatment of one trauma using EMDR, two of the participants no longer had clinically significant scores on any of the four personality scales (<75), while the one participant had clinically significant scores on all of the personality scale (≥ 75). The two participants whose personality patterns completely reduced (<75), also had clinically significant anxiety disorder and dysthymia (≥ 75), and one of them also had clinically significant major depression (≥ 75). Both of these two participants only had clinically significant anxiety disorder at the end of treatment (≥ 75). At her 36-month follow-up, one of these two participants had no clinically significant symptoms (<75), while the other participant did not attend her follow-up appointments. The participant with no reduction in her personality pattern following EMDR treatment continued to have clinically significant avoidant, depressive, dependent and masochistic personality scales at her 30-month follow-up (≥ 75). The participant with no reduction in her personality scale also had clinically significant anxiety, dysthymia, post traumatic stress disorder and major depression before EMDR treatment. Her clinical syndromes reduced considerably so that at the end of treatment she only had clinically significant anxiety disorder (≥ 75). The gains for major depression and post traumatic stress were maintained (<75), however the gains were not maintained for dysthymia (>75). The participant felt that she could not relinquish the guilt she felt following a termination of a pregnancy.

One female participant had clinically significant scores (≥ 75) on four personality scales, avoidant, depressive, masochistic and negativistic, before undergoing EMDR treatment. After the treatment of the first trauma, there was a reduction in avoidant

symptoms, so that the score on the avoidant scale was no longer clinically significant (<75). However, the participant still reported clinically significant depressive, masochistic and negativistic personality patterns after the treatment of one trauma (≥ 75). This participant underwent EMDR treatment for three traumas, and at the end of treatment the participant reported clinically significant scores on all four of the personality scales, schizoid, depressive, masochistic and negativistic. At the 36-month follow-up, the participant reported clinically significant scores on the schizoid, avoidant, depressive, masochistic, negativistic and dependent personality scale (≥ 75). Before treatment, the participant had clinically significant anxiety, dysthymia and major depression (≥ 75). After the treatment of the first traumas, the participant no longer had clinically significant major depression (<75), but still reported clinically significant anxiety and dysthymia (≥ 75). At the end of treatment, the participant only reported clinically significant dysthymia. However, at her 36-month follow-up the participant reported clinically significant anxiety, dysthymia and major depression (≥ 75). This participant reported the highest amount of childhood trauma in this research study, including the suicide of her mentally ill father when she was two years old, the sexual abuse by her step-father, the abandonment by her partner when she was 18 years old and five months pregnant, other abusive partners and bullying at work. The participant often expressed that 'no one could help her'. Extended EMDR treatment may have reduced her symptoms further. However her GP reported that over a period of 20 years, no amount of medication prescribed seemed to provide her with any relief and the GP wondered if there was an investment in having the symptoms. On the other hand, there is also the possibility of structural neurological difficulties, since her father suffered from mental health difficulties.

Two participants reported the same clinically significant personality pattern on four scales, namely; depressive, dependent, masochistic and negativistic (≥ 75) before undergoing EMDR treatment. After the treatment of the first trauma, one participant no longer had a

clinically significant score on any of the four personality pattern scales (<75). These gains were maintained at the six-month follow-up for three of the personality scales, namely; dependent, masochistic and self-defeating (<75). However, the participant did have a clinically significant narcissistic pattern after treatment (≥ 75), which is associated with a healthy adaptive personality on the MCMI-III. This participant also had clinically significant anxiety, dysthymia, post traumatic stress and major depression (≥ 75) before undergoing EMDR treatment. The participant underwent treatment for one childhood trauma, and after treatment his anxiety, dysthymia, post traumatic stress and major depression were no longer clinically significant (<75). These gains were maintained at his six-month follow-up. The other participant only had a clinically significant score on the dependent scale (≥ 75), and no longer had a clinically significant score on three of the personality pattern scales, namely depressive, masochistic and negativistic (<75), after the treatment of the first trauma. This participant underwent EMDR treatment for two traumas. At the end of her EMDR treatment, she no longer had clinically significant scores on the depressive, masochistic and negativistic personality pattern scales. These gains were maintained at her 31-month follow-up. In addition, her histrionic and narcissistic personality scales were clinically significant (≥ 75), which is associated with mental health on the MCMI-III. This client also had clinically significant anxiety and major depression before treatment (≥ 75). After the treatment of the first trauma, her symptoms reduced considerably and she no longer had clinically significant anxiety and major depression (<75). These results reduced even further by the end of treatment and were maintained at her 31-month follow-up. This particular cluster of personality scales, depressive, dependent, masochistic and negativistic, is noteworthy because it seemed to be the most responsive to EMDR treatment, as the symptoms reduced quickly and were maintained at follow-up. One participant, who experienced a considerable

childhood trauma, still experienced a clinically significant decrease in symptoms. However, these results cannot be generalised due to only two participants having this profile.

One male participant reported three clinically significant personality patterns, namely, avoidant, depressive and masochistic (≥ 75). After the treatment of the first trauma, the participant reported an increase in a number of personality patterns so that five were now clinically significant, namely; schizoid, avoidant, depressive, dependent and masochistic personality patterns. This participant had been severely burnt at the age of four years old, and was, for a number of months, in a hospital a considerable distance away from his parents. The participant seemed much more disturbed after the processing of his burn memory. The participant went onto to reprocess two further traumas with EMDR. At the end of his EMDR treatment, the participant no longer had a clinically significant schizoid, avoidant, depressive, dependent and masochistic personality patterns and these results were maintained at his 35-month follow-up. However, at the 35-month follow-up the participant did report a clinically significant compulsive personality pattern (≥ 75), which is seen in healthy subjects on the MCMI-III. Before treatment, the participant also reported clinically significant anxiety and dysthymia, which was still clinically significant after the treatment of the first trauma (≥ 75). However, at the end of EMDR treatment, the participant no longer had clinically significant anxiety and dysthymia (<75) and these gains were maintained at his 35-month follow-up. In addition, at the end of treatment and at follow-up the participant had clinically significant histrionic and compulsive personality patterns, which are seen in healthy subjects completing the MCMI-III.

One female participant had clinically significant scores on three personality scales, avoidant, dependent and negativistic (≥ 75), before undergoing EMDR treatment. This participant underwent EMDR treatment for two traumas. After the treatment of the first trauma, the participant only had a clinically significant score for the dependent scale, with a

reduction in the avoidant and negativistic symptoms. At the end of treatment, there was a further reduction in all the personality patterns, so none of the personality patterns were clinically significant (<75). However, these results were not maintained and the participant had clinically significant schizoid, avoidant, depressive, dependent, sadistic and negativistic personality patterns at her 12-month follow-up. It should be noted that the participant had been involved in a serious road traffic accident two months before her follow-up measurement and the results of her follow-up measurement may be influenced by the trauma of this car accident. She was offered further EMDR treatment at the post traumatic stress clinic.

One female participant had three clinically significant personality patterns before undergoing EMDR treatment, namely; avoidant, dependent and masochistic (≥ 75). After the treatment of one trauma using EMDR, the participant reported a complete reduction in all her personality patterns (<75) and these were maintained at her 17-month follow-up. At her 17-month follow-up, the participant also reported a clinically significant narcissistic personality scale (≥ 75), which on the MCMI-III is also found to be associated with a healthy adaptive personality. Before treatment the participant reported clinically significant anxiety, dysthymia, post traumatic stress and major depression. At the end of treatment, her clinical symptoms had completely reduced and her anxiety, dysthymia, post traumatic stress and major depression were no longer clinically significant. These results were maintained at her 17-month follow-up. The remarkable aspect about this client was that she only underwent one relaxation session and one eye movement session. After her eye movement sessions, she reported that her brain started to spin out of control. She described that it was as if she could see the images of the disturbing events spinning faster and faster. The spinning continued to increase in speed to the point she could no longer bear it and she phoned her GP in a panic the following morning. He prescribed benzodiazepine which made her sleep for the day. When

she woke up, she reported that the disturbance of the traumas had completely gone and her subjective unit of disturbance had reduced to zero for all the aspects of the memory of her abusive partner. She explained that she would undergo EMDR therapy again because the discomfort she experienced during the spinning was worth the relief she experienced in such a short time. The researcher postulates that increased ocular motility was associated with the rapid cognitive shifts (Antrobus et al, 1964; Singer et al, 1965).

One female participant reported three clinically significant personality patterns before EMDR treatment, namely avoidant, masochistic and negativistic (≥ 75). She also had clinically significant anxiety disorder and went onto complete the full EMDR protocol for a traumatic birth in which she almost lost her life. Following EMDR treatment, all her symptoms had reduced so that she no longer had clinically significant anxiety nor clinically significant avoidant, masochistic and negativistic personality patterns (<75). These results were maintained at her 14-month follow-up. In addition, at her 14-month follow-up, she had clinically significant compulsive and histrionic personality patterns (≥ 75), which on the MCMI-III is associated with mental health and an adaptive healthy personality.

One female participant had three clinically significant personality patterns before undergoing EMDR treatment, namely; depressive, dependent and masochistic (≥ 75). After the treatment of the first trauma, there was a significant reduction in her dependent and masochistic personality patterns so that these were no longer clinically significant (<75). However, her depressive personality pattern remained clinically significant (≥ 75) after the treatment of one trauma. These results were maintained at the end of treatment and at her 27-month follow-up. Before EMDR treatment, the participant had clinically significant anxiety and dysthymia (≥ 75). After the treatment of the first trauma, there was no reduction in her anxiety and dysthymia which remained clinically significant (≥ 75) and she also reported clinically significant major depression (≥ 75). The first trauma to be reprocessed was the

death of a close relative in a bus accident. She had watched the accident on television news and had intrusive memories of the wreckage and the bodies laid out in body bags. However, between the end of treatment and her 27-month follow-up, her symptoms had reduced considerably and she reported no clinically significant dysthymia and major depression (<75) at her 27-month follow-up. However, she still had a clinically significant anxiety disorder (≥ 75) at her follow-up.

One male participant was the only combat veteran in the study. Before treatment he had a clinically significant schizoid, depressive and negativistic personality pattern (≥ 75), and clinically significant anxiety, dysthymia and major depression (≥ 75). The participant had a text book post traumatic stress profile. The first trauma treated using EMDR were traumatic memories of the Falklands war, which included his boat being bombed, front line fighting and body recovery. After the treatment of this trauma, there was only a reduction of one point on his schizoid personality scale. All the other personality scales and clinical syndromes remained clinically significant (≥ 75). The second memory treated using EMDR was events in the 1990 Gulf war, after which the schizoid and negativistic personality patterns were no longer clinically significant (<75). However, there was no reduction in his clinical syndromes, so he still had clinically significant anxiety, dysthymia, post traumatic stress disorder and major depression (≥ 75). The participant left treatment after the second session of EMDR on the third trauma, which was watching his sister die on the lounge floor at home after the birth of her baby when he was 13 years old. He reported experiencing extreme panic attacks in treatment and stopped treatment. There were also possible secondary gain issues, as the participant requested a considerable number of letters with his diagnosis for compensation claims. The participant attended his 35-month follow-up and reported clinically significant schizoid, avoidant, depressive and negativistic personality pattern, and clinically significant anxiety, dysthymia, post traumatic stress and major depression (≥ 75).

The researcher believes that this participant received insufficient EMDR sessions, as there were still a number of traumas with a high subjective unit of disturbance that had not been fully processed using EMDR.

One female participant had two clinically significant personality patterns before undergoing EMDR treatment, namely; depressive and dependent (≥ 75). The participant underwent EMDR treatment for two traumas. After the treatment of the first trauma, the participant no longer had a clinically significant depressive personality pattern and this was maintained at the end of treatment and at her 13-month follow-up. However, her dependent personality pattern was still clinically significant after the treatment of the first trauma, but was no longer clinically significant at the end of treatment and at her 13-month follow-up. The participant also had a clinically significant diagnosis of anxiety, dysthymia and major depression (≥ 75) before EMDR treatment. After the treatment of one trauma, the participant no longer had clinically significant major depression (<70), but her anxiety and dysthymia was still clinically significant (≥ 75). However, by the end of treatment her symptoms had reduced so that she no longer had clinically significant anxiety, dysthymia and major depression. These results were maintained at her 13-month follow-up measure.

One female participant had two clinically significant personality patterns; schizoid and negativistic (≥ 75), and clinically significant anxiety, dysthymia, post traumatic stress disorder and major depression (≥ 75), before EMDR treatment. The participant underwent EMDR treatment for one trauma of being a pedestrian and being hit by a car. At the end of EMDR treatment, all her symptoms had reduced. Her schizoid and negativistic personality patterns and her clinical syndromes, anxiety, dysthymia, post traumatic stress and major depression, were no longer clinically significant (<75), at the end of treatment. These results were maintained at her 14-month follow-up measure. In addition, at 14-month follow-up the

participant had clinically significant histrionic and narcissistic personality patterns, which on the MCMI-III is associated with mental health and an adaptive healthy personality.

Two participants had two clinically significant personality patterns; dependent and masochistic (≥ 75), with one participant also having a clinically significant histrionic personality scale. Both these participants underwent treatment for traumatic child birth. After the treatment of the trauma using EMDR, both participants no longer had clinically significant dependent and masochistic personality pattern (<75). Both participants had clinically significant anxiety disorder, and one also had clinically significant dysthymia (≥ 75). After treatment, both participants no longer had clinically significant anxiety or dysthymia. The participant with anxiety and dysthymia before EMDR treatment returned for the follow-up measure and had maintained all her gains, so that she no longer had clinically significant clinical syndromes or personality patterns (≥ 75). The other participant did not attend her follow-up measure.

One participant had two clinically significant personality patterns; sadistic and narcissistic (≥ 75) before EMDR treatment. The participant also had clinically significant anxiety, dysthymia and post traumatic stress (≥ 75) before treatment. After the treatment of the trauma, the participant no longer had clinically significant anxiety, post traumatic stress, or a sadistic and narcissistic personality pattern (<75). However, at the end of treatment the participant did have a clinically significant antisocial and masochistic personality pattern and there was no improvement on his dysthymia scale (≥ 75). The researcher was unable to explain this increase. This participant was the youngest in the study and did not attend his follow-up measure.

One participant had two clinically significant personality patterns, antisocial and negativistic (≥ 75), and a clinically significant anxiety disorder (≥ 75) before EMDR treatment. After the treatment of one trauma, the participant still had a clinically significant

negativistic personality pattern and clinically significant anxiety (≥ 75). After the treatment of the second trauma, the participant had no clinically significant personality patterns (<75), but still had clinically significant anxiety (≥ 75). These results were maintained at his 14-month follow-up (≥ 75).

One participant only had a clinically significant schizoid personality pattern (≥ 75) before EMDR treatment. The participant also had clinically significant anxiety, dysthymia, post traumatic stress and major depression (≥ 75), following a life threatening road traffic accident. After the EMDR treatment of this trauma, all the symptoms reduced considerably, so that the participant no longer had clinically significant schizoid personality pattern, anxiety, dysthymia, post traumatic stress and major depression. These gains were maintained at his 10-month follow-up, and the participant had resumed full-time work after being off work for almost two years.

One participant only had a clinically significant dependent personality pattern (≥ 75), which reduced with the treatment of a road traffic accident trauma. The participant also reported clinically significant anxiety disorder (≥ 75) before treatment, which increased with EMDR treatment. Following EMDR treatment, the participant also reported clinically significant post traumatic stress disorder. Unfortunately the participant had moved home, so the researcher was unable to contact the participant for the follow-up measure to see if the end results were maintained or whether his symptoms improved.

One participant only had a clinically significant depressive personality pattern (≥ 75), and clinically significant anxiety, dysthymia and post traumatic stress disorder (≥ 75) before EMDR treatment. After the treatment of the trauma of his wife dying, the participant no longer had clinically significant post traumatic stress disorder. However, the participant still had clinically significant anxiety and dysthymia. There was also no improvement in his clinically significant depressive personality pattern, and the participant also had a clinically

significant schizoid personality pattern scale, after treatment. At his 14-month follow-up, the participant still had a clinically significant depressive personality pattern (≥ 75) and clinically significant anxiety and dysthymia (≥ 75).

One participant only had a clinically significant negativistic personality pattern (≥ 75) and clinically significant anxiety (≥ 75) before EMDR treatment. Following EMDR of one trauma, the symptoms reduced of both her negativistic personality pattern and her anxiety so that these were no longer clinically significant (<75). These results were maintained at her 38-month follow-up. In addition, at the end of treatment and at follow-up the participant had clinically significant histrionic and compulsive personality patterns, which on the MCMI-III is associated with mental health.

One participant only had a clinically significant compulsive personality pattern (≥ 75) and no clinically significant clinical syndromes (<75). After the EMDR treatment, the participant had no clinically significant personality patterns and no clinically significant clinical syndromes (<75).

Four participant reported no clinically significant personality patterns (<75), even though they had clinically significant clinical syndromes. Of these four participants, two reported clinically significant anxiety and major depression, while the other two reported clinically significant anxiety (≥ 75). At the end of EMDR treatment, no participant had clinically significant major depression, with only two having clinically significant anxiety. At the follow-up measure, only one participant reported clinically significant anxiety and dysthymia (≥ 75), and the other participants had no clinically significant syndromes (<75).

The 32 participants in this research study generated 24 different personality configurations, which made it difficult to compare the results of the participants. Although some personality configurations tended to experience more of a reduction in symptoms than other personality configurations, these results cannot be generalised to a clinical population

because of the small sample size. Participants with six clinically significant personality patterns, namely, schizoid, avoidant, depressive, dependent, masochistic and negativistic, tended to have the least reduction in personality patterns following EMDR treatment. The participants who had two to five clinically significant personality patterns tended to have variations of; schizoid, avoidant, depressive, dependent, masochistic and negativistic, with varying reductions in personality patterns. However, participants with one clinically significant personality pattern; depressive, dependent, masochistic, schizoid, avoidant or negativistic seemed to respond well to EMDR treatment and maintained their gains. This may lead to the conclusion that the fewer clinically significant personality patterns the participant may have, the more the reduction in personality patterns the participant may experience with EMDR treatment. The researcher acknowledges that similar results may also be obtained with other types of psychological therapies such as CBT.

6.2.4 Summary of effects of EMDR on clinical personality patterns

This study investigated the effects of EMDR on clinical personality patterns; schizoid, avoidant, depressive, dependent, histrionic, narcissistic, antisocial, sadistic, compulsive, negativistic and masochistic, on the MCMI-III. The results of the analysis of all the participants suggested that there was a clinically significant decrease in avoidant, depressive, dependent, antisocial, sadistic, negativistic and masochistic personality patterns on the MCMI-III between the measurement before EMDR treatment and the follow-up measurement at the end of the study. Whilst the reduction in schizoid personality pattern was not clinically significant at the .01 level between the measurement before EMDR treatment and the follow-up measurement at the end of the study, it tended towards significance (i.e., $p < .05$).

The dependent personality pattern experienced the greatest reduction in symptoms with EMDR treatment. Of the participants who had clinically significant dependent

personality pattern before EMDR treatment, 53% no longer reported clinically significant scores on the MCMI-III (>75) after the treatment of one trauma. This increased to 76% at the end of the EMDR treatment and these gains were maintained by 76% at the follow-up measurement at the end of the study.

Fifty six percent of the participants who had masochistic personality pattern before EMDR treatment no longer had a clinically significant score on the MCMI-III (>75) after the treatment of one trauma. At the end of the EMDR treatment, 75% no longer had clinically significant scores on the MCMI-III, and these gains were maintained by 64% at the follow-up measurement at the end of the study.

The results of the analysis also suggested that 54% of the participants who had negativistic personality pattern before EMDR treatment no longer had a clinically significant score on the MCMI-III (>75) after the treatment of one trauma. At the end of the EMDR treatment, 77% no longer had clinically significant scores on the MCMI-III and these gains were maintained by 46% at the follow-up measurement at the end of the study.

The results of the analysis also suggested that 54% of the participants who had avoidant personality pattern before EMDR treatment no longer had a clinically significant score on the MCMI-III (>75) after the treatment of one trauma. At the end of the EMDR treatment, 69% no longer had clinically significant scores on the MCMI-III, and these gains were maintained by 38% of these participants at the follow-up measurement at the end of the study.

With regard to sadistic and antisocial personality patterns, two participants had clinically significant sadistic personality pattern and one participant had clinically significant antisocial personality pattern before EMDR treatment. After the EMDR treatment of one trauma all three participants no longer had a clinically significant score on the MCMI-III

(>75%), and these gains were maintained at the end of treatment and at the follow-up measurement at the end of the study by all three participants.

The reduction in symptoms in dependent, masochistic, negativistic, avoidant and sadistic personality pattern on the MCMI-III with EMDR treatment are consistent with the assumption of Shapiro (2007) that states a comprehensive psychological reorganisation may occur as a result of the effective processing of critical early life using EMDR, which may be reflective by changes in 'personality characteristics' (Shapiro, 2007, p.5). This is particularly consistent with the gains achieved on the dependent personality pattern scale on the MCMI-III. In addition, the reduction in symptoms in the personality patterns in this study are consistent with the findings of Edmond et al. (2004, p. 260) who reported changes on a 'deeper, more profound level', with EMDR treatment. The results of the study are unique as to date there have been no empirical studies into the effect of EMDR treatment on personality patterns, however more research will be needed in the future to verify these results.

The depressive personality pattern experienced the second lowest reduction in symptoms with EMDR treatment. Of the participants who had clinically significant depressive personality pattern before EMDR treatment, 33% no longer reported clinically significant scores on the MCMI-III (>75) after the treatment of one trauma. This increased to 40% at the end of the EMDR treatment but the gains were only maintained by 33% at the follow-up measurement at the end of the study.

The schizoid personality pattern had the lowest reduction in symptoms with EMDR treatment compared to all the other personality patterns under investigation. The results of the analysis revealed that 42% of the participants who had schizoid personality pattern before EMDR treatment no longer had a clinically significant score on the MCMI-III (>75) after the treatment of one trauma. However these gains were only maintained by 29% of these participants at the end of the EMDR treatment and by 29% at the follow-up measurement at

the end of the study. In addition, at the follow-up measurement four more participants reported a clinically significant schizoid personality pattern at the end of the study, but these did not have a clinically significant schizoid personality pattern before EMDR treatment.

The schizoid and depressive personality pattern produced the lowest reduction in symptoms with EMDR treatment and the results of these findings seem inconsistent with the assumption of Shapiro (2007) that a comprehensive psychological reorganisation may occur as a result of the effective processing of critical early life using EMDR, which may be reflected by changes in characteristics of personality. The results of the schizoid and depressive personality pattern also seem inconsistent with the findings of Edmond et al. (2004, p. 260) who reported changes on a 'deeper, more profound level', with EMDR treatment. More research would be needed in the future to verify these results.

The analysis of all the participants in this study revealed a clinically significant increase in histrionic and narcissistic personality pattern as measured by the MCMI-III between the measurement before the EMDR treatment and at the follow-up measurement at the end of the study. Furthermore, although the increase in compulsive personality pattern between the measurement before the EMDR treatment and at the follow-up measurement at the end of the study was not significant at the .01 level, it did tend towards significance (i.e., $p < .05$). Craig (2008) explains that elevated scores on the compulsive, histrionic and narcissistic personality patterns on the MCMI-III are rarely seen in the psychiatric population and are negatively correlated with psychiatric disturbances. In fact, in nonclinical populations, these personality patterns are often the highest scales achieved, and are found in training air force pilots, family practice residents, college students, first year seminary student and psychology students. Therefore, increases in narcissistic, histrionic and compulsive personality pattern may suggest that participants have moved away from psychiatric

disturbances and towards mental health after the EMDR. These results are consistent with the assumption by Shapiro (2007) that a comprehensive psychological reorganisation may occur as a result EMDR treatment, which may be reflected by changes in characteristics of personality. These results also seem consistent with the findings of Edmond et al. (2004, p. 260) who reported changes on a 'deeper, more profound level', with EMDR treatment.

The 32 participants in this research study generated 24 different personality configurations, which made it difficult to compare the results of the different participants. However, although some personality patterns may have emerged in this research, these results cannot be generalised to a clinical population because of the small sample size. Participants with six clinically significant personality patterns, namely, schizoid, avoidant, dependent, masochistic and negativistic, tended to have the least reduction in symptoms following EMDR treatment. The participants who had two to five clinically significant personality patterns tended to have variations of; schizoid, avoidant, dependent, masochistic and negativistic, with varying results. Participants with the configuration of clinically significant personality pattern; dependent, masochistic and negativistic seemed to respond best to EMDR and maintained their gains at the follow-up measurement at the end of the study. Participants with only one clinically significant personality pattern, such as schizoid and avoidant, also experienced considerable reduction in their symptoms following EMDR treatment. This may lead to the conclusion that the fewer clinically significant personality patterns a participant may have, the more the reduction in symptoms the participant may experience with EMDR treatment. The researcher acknowledges that similar results may also be obtained with other types of psychological therapies as participants with several severe personality patterns may be more resistant to change, and this would need to be investigated in future research.

6.3 Discussion of effects of EMDR on severe personality patterns.

This research study analysed the effects of EMDR with three severe personality patterns on the MCMI-III namely, schizotypal, borderline and paranoid personality pattern. While the participants completed these scales on the MCMI-III, it must however be pointed out that none of the participants had a clinically significant severe personality pattern (>75) on the MCMI-III before EMDR treatment as a clinically significant score on these three personality scales was part of the exclusion criteria. Therefore these results cannot be generalised to people who have clinically significant schizotypal, borderline and paranoid severe personality pattern. However, a number of participants had a score within one standard deviation above the mean (60-74) on the MCMI-III. These results were considered as they may provide an indicator of how these three conditions may respond to EMDR treatment. More research would be needed to establish whether EMDR is effective with these severe personality patterns.

In this research study, the term schizotypal personality pattern refers to the schizotypal severe personality pattern scale on the MCMI-III. The paired t-test for significant change suggested that there was a significant decrease in the schizotypal severe personality pattern for all the participants between the measurement before EMDR treatment and after the treatment of one trauma, and between the measurement before EMDR treatment and after the treatment of multiple traumas. The paired t-test for significant change also suggested that there was also a significant decrease in the schizotypal severe personality pattern for all the participants between the measurement before EMDR treatment and the follow-up measure at the end of the research study. However, the paired t-test for significant change suggested that there was no significant change in the schizotypal severe personality pattern for all the participants between the measurement at the end of EMDR treatment and the follow-up

measurement at the end of the research study, which means that the gains achieved were maintained.

Before EMDR treatment, 21 of the 32 participants in the study (66% of all the participants) had a score between 60 and 74, or within one standard deviation above the mean, on the schizotypal severe personality pattern scale on the MCMI-III. After the EMDR treatment of one trauma, the scores for eight of these 21 participants (38% of these participants) had reduced to below the mean (<60). At the end of the EMDR treatment, or after the treatment of multiple traumas, the scores of 11 of these 21 participants (52% of these participants) had reduced to below the mean (<60). At the follow-up measurement at the end of the research study, the scores for ten of these 21 participants (48% of these participants) remained below the mean (<60) on the schizotypal severe personality scale on the MCMI-III.

To date no research has been conducted on the effects of EMDR treatment on schizotypal severe personality pattern scale on the MCMI-III, therefore the researcher could not compare the results of this study to the results of other studies. Instead these results may offer new findings of the possible effects of EMDR treatment with people with elevated scores on schizotypal severe personality pattern scale on the MCMI-III. People with schizotypal severe personality pattern tend to remain on the margins of society due to almost no personal attachments (Millon, 2007; Craig, 2008). They tend to be irrelevant, tangential, or confused and absorbed in their own thoughts. With sufficient stress, the person may develop a psychotic disorder (Craig, 2008). The researcher of this study postulates that the reduction in the symptoms of schizotypal severe personality pattern with EMDR treatment may leave people less absorbed in their own thoughts and less confused because some of their distressing thoughts have been processed with EMDR. They may also be more open to make social attachments as their discomfort with people may have eased. Further research is

needed to investigate the effects of EMDR on schizotypal severe personality pattern and test these assumptions fully.

In this research study, the term borderline personality pattern refers to the borderline personality pattern scale on the MCMI-III. The paired t-test for significant change suggested that there was a significant decrease in the borderline personality pattern for all the participants between the measurement before EMDR treatment and after the treatment of one trauma, and between the measurement before EMDR treatment and after the treatment of multiple traumas. The paired t-test for significant change also suggested that there was also a significant decrease in the borderline personality pattern for all the participants between the measurement before EMDR treatment and the follow-up measurement at the end of the research study. However, the paired t-test for significant change suggested that there was no significant change in the borderline personality pattern for all the participants between the measurement at the end of EMDR treatment and the follow-up measurement at the end of the research study, which means that the gains achieved were maintained.

Before EMDR treatment, 19 of the 32 participants in the study (59% of all the participants) had a score of between 60 and 74, or within one standard deviation above the mean, on the borderline severe personality pattern scale on the MCMI-III. After the treatment of one trauma with EMDR the scores for 15 of these 19 participants (79% of these participants) had reduced to below the mean (<60). However three additional participants, who had scores less than 60 on the borderline personality scale on the MCMI-III before EMDR treatment, had their scores increase to between 60 and 74 after the treatment of one trauma. At the end of the EMDR treatment, or after the treatment of multiple traumas, the scores of 16 of the 19 participants (84% of these participants) had reduced to below the mean (<60) on the borderline severe personality pattern scale. The three additional participants

whose scores had increased after the treatment of one trauma, then all experienced a decreased in their scores after the EMDR treatment of multiple traumas to below the mean (<60) on the MCMI-III borderline personality pattern scale. At the follow-up measurement at the end of the research study, the scores for 16 of the 19 participants (84% of these participants) remained below the mean (<60) on the borderline severe personality scale on the MCMI-III. However, one of the additional participants who had a score less than 60 on the borderline personality scale on the MCMI-III before EMDR treatment, had a score between 60 and 74 on the borderline personality pattern scale at the end of the research study. This participant was a combat veteran and his borderline personality pattern score on the MCMI-III had increased from the start of the EMDR treatment to the end of the research study. However, his score on the borderline personality pattern scale on the MCMI-III was still not clinically significant at the end of the study.

The borderline severe personality pattern on the MCMI-III revealed a greatest reduction in symptoms with EMDR treatment compared to schizotypal and paranoid severe personality patterns. People with borderline severe personality pattern on the MCMI-III have an attachment disorder and tend to have intense unstable relationships, with strong dependency needs and fears of abandonment. They lack a clear identity, engage in impulsive behaviours and constantly seek approval and attention (Millon, 1997; Craig, 2008). Brown and Shapiro (2006) documented a case study of a woman with borderline personality disorder who underwent 20 sessions of EMDR treatment. The results on the standard measures suggested a clinically significant change in affect, control, personal management, identity disturbance and interpersonal relating (Brown & Shapiro, 2006). The results of the present study are consistent with the findings of Brown and Shapiro (2006) as the scores in the study reduced from within one standard deviation above the mean (60-74) to below the mean (<60) on the borderline severe personality pattern on the MCMI-III for 79% of these participants

after the EMDR treatment of one trauma, for 84% of these participants after the treatment of multiple traumas, and the gains were maintained by 84% of these participants.

In this research study, the term paranoid personality pattern refers to the paranoid personality pattern scale on the MCMI-III. The paired t-test for significant change suggested that there was a significant decrease in the paranoid personality pattern for all the participants between the measurement before EMDR treatment and after the treatment of one trauma, and between the measurement before EMDR treatment and after the treatment of multiple traumas. The paired t-test for significant change also suggested that there was also a significant decrease in the paranoid personality pattern for all the participants between the measurement before EMDR treatment and the follow-up measurement at the end of the research study. However, the paired t-test for significant change suggested that there was no significant change in the paranoid personality pattern for all the participants between the measurement at the end of EMDR treatment and the follow-up measurement at the end of the research study, which means that the gains achieved were maintained.

Before EMDR treatment, 25 of the 32 participants in the study (72% of all the participants) had a score of between 60 and 74, or within one standard deviation above the mean, on the paranoid severe personality pattern scale on the MCMI-III. After the treatment of one trauma with EMDR, the scores for 13 of these 25 participants (52% of these participants) had reduced to below the mean (<60). However one additional participant, who had a score less than 60 on the paranoid personality scale on the MCMI-III before EMDR treatment, had his score increase to between 60 and 74 after the treatment of one trauma. At the end of the EMDR treatment, or after the treatment of multiple traumas, the scores of 17 of the 25 participants (68% of these participants) had reduced to below the mean (<60) on the paranoid severe personality pattern scale. The one additional participant whose scores had

increased after the treatment of one trauma, then experienced a decrease in his score after the treatment of multiple traumas to below the mean (<60) on the MCMI-III paranoid personality pattern scale. At the follow-up measurement at the end of the research study, the scores for 17 of the 25 participants (68% of these participants) remained below the mean (<60) on the paranoid severe personality pattern scale on the MCMI-III, which means that the gains were maintained between the end of the EMDR treatment and the follow-up measurement at the end of the study. However, the one additional participant who had a score less than 60 on the paranoid personality scale before EMDR treatment did not maintain his gains and at the follow-up measurement his scores on the paranoid personality scale had increased again to between 60 and 74. However, his score on the paranoid personality pattern scale on the MCMI-III at the end of the study was still not clinically significant.

To date no research has been conducted on the effects of EMDR treatment on the paranoid severe personality pattern on the MCMI-III, therefore the researcher was unable to compare the results of this study with other research studies. Instead these results may offer new findings of the possible effects of EMDR treatment with people with elevated scores on paranoid severe personality pattern scale on the MCMI-III. People with paranoid severe personality pattern on the MCMI-III tends to be irritable, hostile, abrasive, argumentative, and often extremely mistrustful of people as they imagine people are trying to control them (Millon, 2007; Craig, 2008). Their thoughts are often rigid with delusions of persecution or grandeur, and they have ideas of reference (Craig, 2008). The researcher of this study postulates that the reduction in the symptoms of paranoid severe personality pattern with EMDR treatment may leave people feeling less irritable, hostile, belligerent, and less mistrustful that people are trying to control them. Further research is needed to test these assumptions fully and investigate the effects of EMDR on the paranoid severe personality pattern on the MCMI-III.

In summary, the analysis of the severe personality pattern revealed that there was a clinically significant reduction for all participants in the schizotypal, borderline and paranoid severe personality pattern on the MCMI-III following the EMDR treatment of one trauma and of multiple traumas. These gains were maintained at the follow-up measurement at the end of the study. Even though the participants did not have a clinically significant severe personality pattern score on the MCMI-III before EMDR treatment, a considerable number of participants had a score on the severe personality scales on the MCMI-III that fell within one standard deviation above the mean (60-74).

The analysis revealed that the participants with a score within one standard deviation above the mean (60-74) on the severe personality pattern scales on the MCMI-III, revealed that after the treatment of one trauma the scores reduced to below the mean (<60) for 38% of participants with schizotypal personality pattern, for 59% of participants with borderline personality pattern, and 52% for participants with paranoid severe personality pattern.

The analysis of the results of the participants with a score within one standard deviation above the mean (60-74) on the severe personality pattern scales on the MCMI-III, revealed that after the EMDR treatment of multiple trauma the scores reduced to below the mean (<60) for 52% of participants with schizotypal personality pattern, for 84% of participants with borderline personality pattern, and 68% for participants with paranoid severe personality pattern.

The analysis of the results of the participants with a score within one standard deviation above the mean (60-74) on the severe personality pattern scales on the MCMI-III at the follow-up measurement at the end of the study revealed that the scores had reduced to below the mean (<60) for 48% of participants with schizotypal personality pattern, for 84% of participants with borderline personality pattern, and 68% for participants with paranoid severe personality pattern.

6.4 Discussion of effects of EMDR on depressive constructs

6.4.1 Effects of EMDR on major depression

In this research study, the term major depression refers to the major depression scale on the MCMI-III. People with major depression on the MCMI-III tend to report that they feel terribly depressed and sad much of the time for no reason, have completely lost their appetite, their strength is drained out of them even in the morning and looking at the day ahead makes them feel terribly depressed.

The paired t-test for significant change suggested that there was a significant decrease in major depression for all the participants between the measurement before EMDR treatment and after the treatment of one trauma, and between the measurement before EMDR treatment and after the treatment of multiple traumas. The paired t-test for significant change also suggested that there was also a significant decrease in major depression for all the participants between the measurement before EMDR treatment and the follow-up measurement at the end of the research study. In addition, the paired t-test for significant change suggested that there was no significant change in major depression for all the participants between the measurement at the end of EMDR treatment and the follow-up measurement at the end of the research study, which means that the gains achieved were maintained.

Out of the 32 participants, 12 participants had clinically significant major depression (≥ 75 on the MCMI-III major depression scale), or 37.5% of the participants had clinically significant major depression before EMDR treatment. After the treatment of one trauma, 11 of the 12 participants (92% of these participants) no longer had clinically significant major depression, while one participant still had clinically significant major depression. However, two other participants who did not have major depression before EMDR treatment reported clinically significant major depression after the EMDR treatment of one trauma. Nevertheless, by the end of the EMDR treatment only two participants had clinically

significant major depression and their major depression remained clinically significant at the follow-up measurement at the end of the study. The two participants who reported clinically significant major depression at the end of the study were the combat veteran and the participant who reported the most amount of childhood traumas. An overall analysis revealed that out of the 14 participants who reported a clinically significant major depression during the study, 12 participants no longer had major depression. This means that 86% of the participants with major depression no longer had major depression at the end of treatment and at the follow-up measurement at the end of the study. This suggests that EMDR is an effective treatment in reducing symptoms of major depression. The researcher postulates that a diagnosis of clinically significant major depression before treatment is a good prognostic indicator for EMDR treatment.

The analysis of the 12 participants who had clinically significant major depression before EMDR treatment in this study revealed that EMDR treatment is effective in reducing the symptoms of major depression, as 86% of participants no longer had significant major depression at the end of the study. The results of this research is consistent with the results of other EMDR research studies, which reported a clinically significant decrease in depression as measured on the BDI (Marcus et al., 1997, 2004; Rothbaum, 1997; Carlson, et al., 1998; Scheck et al., 1998; Ironson et al., 2002; Lee et al., 2002; Taylor et al., 2003; van der Kolk et al., 2007). All these research studies (Marcus et al., 1997, 2004; Rothbaum, 1997; Carlson, et al., 1998; Scheck et al., 1998; Ironson et al., 2002; Lee et al., 2002; Taylor et al., 2003; van der Kolk et al., 2007) analysed the reduction of depressive symptoms on the BDI as secondary measures to the effects of EMDR on symptoms of post traumatic stress. The BDI is highly correlated with the major depression scale on the MCMI-III at .74 (Millon, 1997). This high correlation between the BDI and the major depression scale on the MCMI-III adds weight to the consistency between the findings of the reduction of major depression in this

study and the findings of the reduction of depression in the other EMDR studies (Marcus et al., 1997, 2004; Rothbaum, 1997; Carlson, et al., 1998; Scheck et al., 1998; Ironson et al., 2002; Lee et al., 2002; Taylor et al., 2003; van der Kolk et al., 2007).

In the analysis of the associated symptoms of major depression, of the 12 participants who reported major depression before the EMDR treatment, six of these participants also reported clinically significant anxiety, dysthymia and post traumatic stress. After the treatment of one trauma using EMDR, four of the six participants report they no longer had clinically significant anxiety, dysthymia and post traumatic stress. These gains were maintained at their follow-up measurement, which ranged from seven- to 17-months. One of the six participants no longer had clinically significant dysthymia and posttraumatic stress after the treatment of the first trauma, but still had clinically significant anxiety. At the end of her EMDR treatment and at her 36-month follow-up this participant still had clinically significant anxiety, and her gains in dysthymia were not maintained at follow-up either. One of the six participants still had clinically significant anxiety, dysthymia and post traumatic stress after the treatment of the first trauma. However, she no longer had clinically significant dysthymia and post traumatic stress at her 14-month follow-up.

Three of the 12 participants with major depression also had clinically significant anxiety and dysthymia before EMDR treatment. After the EMDR treatment of one trauma, two participants still had clinically significant anxiety and dysthymia, while one participant only had clinically significant anxiety. At the end of the EMDR treatment, one participant had no clinically significant syndromes, the other participant maintain her clinically significant anxiety, while there was no improvement in the third participant who still had clinically significant anxiety and dysthymia. These results remained unchanged at follow-up measurement at the end of the study.

Three of the 12 participants with major depression also had clinically significant anxiety before EMDR treatment. After the treatment of one trauma, only one of these three participants had clinically significant anxiety. At the end of treatment and at the follow-up measurement at the end of the study, all three of these participants no longer had clinically significant anxiety.

Six of the 12 participants with clinically significant major depression before EMDR treatment also had clinically significant depressive personality. Four of these six participants no longer had a clinically significant depressive personality pattern after the treatment of one trauma, or also at the end of EMDR treatment of multiple traumas. Three of the four participants attended the follow-up measurement and maintained these gains. The two participants who did not have clinically significant major depression before EMDR treatment but had clinically significant major depression after the EMDR treatment of one trauma also had a clinically significant depressive personality pattern before treatment. The clinically significant depressive personality remained clinically significant in these two participants after the treatment of one trauma using EMDR, and one remained clinically significant at the follow-up measurement at the end of the study.

In summary, the results of this study indicate that EMDR treatment is effective in reducing the symptoms of major depression as 86% of participants with a clinically significant major depression before EMDR treatment, no longer had clinically significant major depression on the MCMI-III after EMDR treatment. There was a significant reduction in major depression after the EMDR treatment of one trauma, after the treatment of multiple traumas, and at the follow-up measurement at the end of the study. The results of these findings are consistent with the reduction in depression on the BDI reported by other EMDR studies (Marcus et al., 1997, 2004; Rothbaum, 1997; Carlson, et al., 1998; Scheck et al., 1998; Ironson et al., 2002; Lee et al., 2002; Taylor et al., 2003; van der Kolk et al., 2007). In

addition, there was a tendency for associated clinical syndromes to decrease when major depression decreases. For instance, all the participants with a diagnosis of clinically significant major depression and anxiety on the MCMI-III before EMDR treatment experienced a significant reduction in both major depression and anxiety. In addition, 60% of participants with clinically significant major depression, anxiety, dysthymia and post traumatic before EMDR treatment, experienced a significant reduction in all these clinical syndromes if there was a significant reduction in major depression. However, these results were not obtained in participants with clinically significant major depression, anxiety and dysthymia, as some participants still had clinically significant anxiety and/or dysthymia even though there was a reduction in major depression. The researcher postulates that a diagnosis of clinically significant major depression before EMDR treatment is a good prognostic indicator for EMDR treatment.

6.4.2 Effects of EMDR on dysthymia

In this research study, the term dysthymia refers to the dysthymia scale on the MCMI-III. People with dysthymia on the MCMI-III tend to report that they have felt like a failure for some years, they feel guilty because they cannot seem to do things right, they have lost interest in things they previously enjoyed and feel discouraged and sad.

The paired t-test for significant change suggested that there was a significant decrease in symptoms of dysthymia for all the participants between the measurement before EMDR treatment and after the treatment of one trauma, and between the measurement before EMDR treatment and after the treatment of multiple traumas. The paired t-test for significant change also suggested that there was also a significant decrease in dysthymia for all the participants between the measurement before EMDR treatment and the follow-up measurement at the end of the research study. However, the paired t-test for significant change suggested that there

was no significant change in dysthymia for all the participants between the measurement at the end of EMDR treatment and the follow-up measurement at the end of the research study, which means the gains that were achieved were maintained.

Out of the 32 participants who took part in this research study, 19 participants had clinically significant dysthymia (≥ 75 on the MCMI-III dysthymia scale), or 59% of the participants had clinically significant dysthymia before the EMDR treatment. After the treatment of one trauma using EMDR, nine of the 19 participants no longer had clinically significant dysthymia (47% of these participants), while ten participants still reported clinically significant dysthymia. At the end of the EMDR treatment, 14 of the 19 participants no longer had clinically significant dysthymia (73% of these participants). However, at the follow-up measurement at the end of the study 11 of the 19 participants had maintained their gains and no longer had clinically significant dysthymia, which means that 58% of participants no longer had clinically significant dysthymia at the end of the study. However, even though 58% of participants no longer had clinically significant dysthymia at the end of the study, this was not as considerable as the reduction in major depression as 86% of participants no longer had major depression at the end of the study.

The analysis of the 19 participants who had clinically significant dysthymia before EMDR treatment in this study revealed that EMDR treatment is reasonably effective in reducing the symptoms of dysthymia, as 58% no longer had clinically significant dysthymia at the end of the study. The BDI is also quite highly correlated with the dysthymia scale on the MCMI-III at .71 (Millon, 1997). So the findings on the dysthymia scale on the MCMI-III, whilst not as significant as the findings on the major depression scale on the MCMI-III, are still consistent with the findings of other EMDR studies that reported significant reductions in depression with EMDR treatment (Marcus et al., 1997, 2004; Rothbaum, 1997; Carlson, et al., 1998; Scheck et al., 1998; Ironson et al., 2002; Lee et al., 2002; Taylor et al., 2003; van der

Kolk et al., 2007). The high correlation between the BDI and the dysthymia scale on the MCMI-III adds weight to the consistency between the findings of the reduction of dysthymia in this study and the findings of the reduction of depression in the other EMDR studies (Marcus et al., 1997, 2004; Rothbaum, 1997; Carlson, et al., 1998; Scheck et al., 1998; Ironson et al., 2002; Lee et al., 2002; Taylor et al., 2003; van der Kolk et al., 2007).

In the analysis of associated syndromes of dysthymia, six of the 19 participants who reported dysthymia before their EMDR treatment, also had clinically significant anxiety, post traumatic stress disorder and major depression. Five of these six participants no longer had clinically significant dysthymia after the treatment of one trauma. Four of these six participants no longer had any clinically significant clinical syndromes at the follow-up measurement at the end of the study. One of the six participants still had clinically significant anxiety, while the other still had clinically significant anxiety, post traumatic stress and major depression.

Five of the 19 participants with clinically significant dysthymia, also had clinically significant anxiety and post traumatic stress disorder before EMDR treatment. After the EMDR treatment of the first trauma, four of the five participants no longer had clinically significant post traumatic stress and two of the five no longer had a clinically significant anxiety disorder. At the end of treatment and at the follow-up measurement, four of the five participants no longer had clinically significant post traumatic stress. However, at the end of treatment only one of the five participants no longer had clinically significant anxiety, and three of the four that attended their follow-up measurement still had clinically significant anxiety disorder.

Three of the 19 participants with clinically significant dysthymia also had clinically significant anxiety and major depression before EMDR treatment. After the EMDR treatment of one trauma, all of these participants reported clinically significant anxiety disorder but all

of them no longer had clinically significant post traumatic stress disorder. At the end of the EMDR treatment, one of the three participants reported clinically significant anxiety and all had maintained their gains in post traumatic stress. Two of the three participants attended the follow-up measurement, and one reported clinically significant anxiety and post traumatic stress, while the other no longer had clinically significant anxiety and post traumatic stress.

Five of the 19 participants with clinically significant dysthymia, also had clinically significant anxiety before EMDR treatment. After the treatment of one trauma using EMDR, two of these five participants no longer reported clinically significant dysthymia. At the end of the EMDR treatment, four of these five participants no longer reported clinically significant dysthymia. However, these gains were not maintained by some of the participants, and at the follow-up measurement at the end of the study three of these five participants reported clinically significant anxiety.

In summary, the results suggest EMDR treatment is effective in reducing the symptoms of dysthymia as 58% of participants with a clinically significant dysthymia before EMDR treatment, no longer had clinically significant dysthymia on the MCMI-III at the end of the study. There was a significant reduction in dysthymia after the EMDR treatment of one trauma, at the end of EMDR treatment, and at the follow-up measurement at the end of the study. The results of these findings are consistent with the reduction in depression on the BDI reported by other EMDR studies (Marcus et al., 1997, 2004; Rothbaum, 1997; Carlson, et al., 1998; Scheck et al., 1998; Ironson et al., 2002; Lee et al., 2002; Taylor et al., 2003; van der Kolk et al., 2007). One explanation for the correlation of the BDI to both the major depression scale and the dysthymia scale on the MCMI-III is that the BDI incorporates types of questions from both the major depression and the dysthymia scale on the MCMI-III. However, the analysis of this study reveals that EMDR impacts differently on major depression and dysthymia, and this should be taken into consideration in future studies.

6.4.3 Effects of EMDR on depressive personality pattern

In this research study, the term depressive personality pattern refers to the depressive personality pattern scale on the MCMI-III. People with a clinically significant score on the depressive personality pattern scale on the MCMI-III tend to report a fatalistic attitude, portray a permanent sense of hopelessness, tend to punish themselves, see themselves as valueless, fear abandonment, demand affection and plea for nurturing.

The paired t-test for significant change suggested that there was a significant decrease in symptoms of depressive personality pattern for all the participants between the measurement before EMDR treatment and after the treatment of one trauma, between the measurement before EMDR treatment and at the end of EMDR treatment, and between the measurement before EMDR treatment and the follow-up measurement at the end of the research study. However, although the change in depressive personality pattern for all the participants between the measurement at the end of EMDR treatment and the follow-up measurement at the end of the research study was not significant at the .01 level, the obtained t-value tended towards significance (i.e., $p < .05$), which means that the gains were not well maintained compared to major depression and dysthymia. This suggests that EMDR treatment did not seem to have a long term effect on depressive personality pattern.

Out of the 32 participants in the study, 15 participants had clinically significant depressive personality pattern (≥ 75 on the MCMI-III depressive scale), or 47% of all the participants before EMDR treatment. After the EMDR treatment of one trauma, five of these 15 participants no longer had a clinically significant score on the depressive personality scale. At the end of treatment, six of these 15 participants no longer had a clinically significant score on the depressive personality scale. At the follow-up measurement, only five of the 15 participants maintained their gains. This means that only 33% of participants who had a clinically significant score on the depressive personality pattern scale on the MCMI-III before

EMDR treatment no longer had a clinically significant depressive personality pattern at the end of the research study.

The analysis of the 15 participants who had clinically significant depressive personality pattern before EMDR treatment revealed that depressive personality pattern does not respond as well as major depression and dysthymia to EMDR treatment, as 33% of participants with clinically significant depressive personality pattern no longer had clinically significant depressive personality pattern at the end of the study compared to 86% of the participants for major depression and 59% of the participants for dysthymia. Therefore the analysis revealed that EMDR treatment is not as effective in reducing the symptoms of depressive personality pattern compared to major depression and dysthymia.

When comparing the results of the effects of EMDR treatment on depressive personality pattern and the results of other EMDR studies that investigated the effects of EMDR on depression, it became evident that the findings of the effects of EMDR treatment with depressive personality pattern is inconsistent with the findings of other studies that reported significant reductions in depression on the BDI (Marcus et al., 1997, 2004; Rothbaum, 1997; Carlson, et al., 1998; Scheck et al., 1998; Ironson et al., 2002; Lee et al., 2002; Taylor et al., 2003; van der Kolk et al., 2007). However, these results are consistent with the findings that the BDI is not highly correlated with the depressive personality pattern scale on the MCMI-III at .56 (Millon, 1997).

In summary, the results of this study indicate that there was a clinically significant reduction in symptoms of depressive personality pattern after the treatment of one trauma, at the end of EMDR treatment, and at the follow-up measurement. However, the analysis between the end of the EMDR treatment and the follow-up measurement revealed that the gains were not as well maintained compared to major depression and dysthymia, and symptoms increased again for some participants after EMDR treatment. The analysis also

revealed that EMDR treatment is not as effective in reducing the symptoms of depressive personality pattern compared to major depressive and dysthymia, as only 33% of participants with significant depressive personality pattern experienced a clinically significant reduction in symptoms compared to 86% of the participants for major depression and 59% of the participants for dysthymia. The findings of this study revealed that EMDR has different effects on different types of depression, namely major depression, dysthymia and depressive personality, which is a new and unique finding in EMDR research. More research is needed to confirm that EMDR does have different effects on the different kinds of depression.

6.4.4 Limitations in the study of depressive symptoms

One participant underwent the full standardised EMDR treatment for four traumas. However the data from his assessments could not be used because the reprocessing of the memories become intertwined, which made it difficult to have clear cut off points to measure after the treatment of each trauma. This client reported clinically significant major depression, dysthymia, post traumatic stress and anxiety. The client reported that his mother died of cancer when he was 18 years old. A few years later he went on holiday to Thailand and was hospitalised with decompression illness after scuba diving. A year later he returned to Thailand and was involved in a bus accident. The morning after the bus accident he was lying on the beach with his cousin, both feeling shaken, when the tsunami struck. Both he and his cousin were caught in the flood water dodging uprooted trees and debris, while being swept inland.

The participant requested that the bus accident be the first trauma treated due to the considerable physiological re-activity he was experiencing when the bus rolled. During the eye movements the participant made significant adaptive links. He realised the bus accident saved his life as he and his cousin were on their way to Khao Lak, which was total obliterated

by the tsunami. Instead the bus accident forced them to remain in a different part of Thailand where the tsunami was not as severe. When the researcher went onto reprocess the second trauma, the tsunami, the participant found that he would repeatedly switch between his mother's death and the tsunami. This made it difficult to have a clear cut-off point to measure the effect of the EMDR treatment of the tsunami and the effect of the EMDR treatment on the death of his mother.

After all four traumas were treated with EMDR, all his clinical syndromes, major depression, dysthymia, post traumatic stress and anxiety that were clinically significant before EMDR treatment, were no longer clinically significant. If these results were included in the research then 86% of participants with major depression would no longer have major depression and 60% would no longer have dysthymia at the end of the study. His cousin had taken a photograph of the approaching tsunami wave as they had been unsure of what was actually happening. Following EMDR treatment, the participant took the photograph of the approaching wave and had it blown up into a picture to place on his bedroom wall. He explained that he wakes up each morning and looks at the wave and smiles and says to himself, 'I was there'. Instead of feeling shaky when he looks at the photo now, he feels quite excited.

6.4.5 Summary of effects of EMDR on depressive symptoms

Out of the three depressive constructs investigated in this study, EMDR seems to be most effective in reducing the symptoms of major depression, as 86% of the participants with major depression before EMDR treatment no longer had major depression at the follow-up measurement at the end of the study. The results of this study suggest that clinically significant major depression on the MCMI-III has a good prognosis in EMDR treatment.

EMDR does not seem to be as effective in reducing symptoms of dysthymia as it is in reducing symptoms of major depression, as only 58% of the participants with clinically significant dysthymia no longer reported these symptoms at the end of the study when compared to 86% of participants who had clinically significant major depression. However, in the analysis, EMDR treatment had a significant effect in reducing the symptoms of dysthymia on the MCMI-III in all the participants.

EMDR was least effective in reducing the symptoms of the depressive personality pattern when compared to participants who reported clinically significant dysthymia and participants who reported a clinically significant major depression before EMDR treatment. Only 33% of participants with clinically significant depressive personality pattern no longer reported clinically significant scores at the end of the study, compared to 59% of participants who no longer reported clinically significant dysthymia, and 86% of participants who no longer reported clinically significant major depression.

The analysis of the results of the research indicates that there was a significant decrease in depressive symptoms: major depression, dysthymia and depressive personality for all participants with EMDR treatment. This is similar to other EMDR research studies that also report a significant decrease in depression as measured on the BDI (Marcus et al., 1997, 2004; Rothbaum, 1997; Carlson, et al., 1998; Scheck et al., 1998; Ironson et al., 2002; Lee et al., 2002; Taylor et al., 2003; van der Kolk et al., 2007). However, the results for this research study cannot easily be compared to the results of other EMDR research studies because available studies have measured different facets of depressive symptoms.

The results of this research study into the effects of EMDR on depressive symptoms: major depression, dysthymia and depressive personality, cannot be generalised to a large clinical population because of the small sample size. However, the results can be used as

preliminary findings for the generation of other studies into the effects of EMDR on the different depressive constructs.

6.5 Discussion of effects of EMDR on other clinical syndromes

6.5.1 Effects of EMDR on post traumatic stress

In this research study, the term post traumatic stress refers to the post traumatic stress scale on the MCMI-III. The paired t-test for significant change suggested that there was a significant decrease in post traumatic stress for all the participants between the measurement before EMDR treatment and after the treatment of one trauma, and between the measurement before EMDR treatment and at the end of EMDR treatment or after multiple traumas. The paired t-test for significant change also suggested that there was also a significant decrease in post traumatic stress for all the participants between the measurement before EMDR treatment and the follow-up measure at the end of the research study. In addition, the paired t-test for significant change suggested that there was no significant change in post traumatic stress for all the participants between the measurement at the end of EMDR treatment and the follow-up measurement at the end of the research study, which means that the participants maintained their gains.

Eleven of the 32 participants, or 34% of the participants, had clinically significant post traumatic stress disorder (≥ 75 on the MCMI-III post traumatic stress scale) before EMDR treatment. After the treatment of one trauma, nine of the 11 participants no longer had clinically significant post traumatic stress disorder. At the end of EMDR treatment, 10 of the 11 participants no longer had clinically significant post traumatic stress and these results were maintained at the follow-up measurement at the end of the study. This means that 91% of participants with post traumatic stress no longer had clinically significant post traumatic stress at the end of the study. The only participant who had clinically significant post traumatic

stress at the end of treatment and at the follow-up measurement was the combat veteran, and the researcher postulates that this is due to insufficient EMDR sessions and possible secondary gains. These results are consistent with the findings of Rothbaum (1997) who reported that 90% of participants no longer had clinically significant post traumatic stress following EMDR treatment. The results of this study are also similar to the results obtained in other research studies into the effects of EMDR on post traumatic stress. For instance, Marcus et al. (1997, 2004) found that 100% of participants who experienced a single trauma no longer had post traumatic stress after three sessions of EMDR treatment, which was 77% of all the participants in that study. Van der Kolk et al. (2007) found that 88% of participants no longer met the criteria for post traumatic stress following EMDR treatment, and 75% of participants no longer were symptomatic at the six-month follow-up. Renfrey and Spates (1994) found that 85% of participants, and Wilson et al. (1995, 1997) found that 84% of participants no longer met the criteria for a post traumatic stress diagnosis following EMDR treatment. Rothbaum et al. (2005) found that 75% of participants, and Ironson et al. (1995, 1997) found that 70% of participants no longer met the criteria for a post traumatic stress diagnosis following EMDR treatment. The results of the study are consistent with the current research that postulates that EMDR treatment is a highly effective in reducing the symptoms of post traumatic stress (Vaughan et al, 1994; Marcus, et al, 1997, 2004; Rothbaum, 1997; Carlson et al, 1998; Lee et al, 2002; Van der Kolk et al. 2007).

The analysis of the associated syndromes revealed that six of the 11 participants who had clinically significant post traumatic stress, also had clinically significant anxiety, dysthymia and major depression before EMDR treatment. After the treatment of one trauma, five of the six participants no longer had clinically significant post traumatic stress, major depression and dysthymia, and four of the six participants no longer had clinically significant

anxiety. At the end of EMDR treatment, none of these six participants had clinically significant post traumatic stress and major depression, and these results were maintained at the follow-up measurement. At the follow-up measurement, two of the six participants still had clinically significant anxiety and one participant still had clinically significant dysthymia.

Five of the 11 participants who had clinically significant post traumatic stress disorder, also had clinically significant anxiety and dysthymia before EMDR treatment. After the treatment of one trauma, four of the five participants no longer had post traumatic stress. However, all five of these participants still had clinically significant dysthymia and three of these five participants still had clinically significant anxiety, after the treatment of one trauma using EMDR. At the end of the EMDR treatment four of the five participants still had clinically significant dysthymia, and three of the five participants still had clinically significant anxiety. Of the four who attended the follow-up measurement at the end of the study, three of the participants had clinically significant anxiety and dysthymia.

In summary, the results of the analysis indicate that EMDR treatment is effective in reducing the symptoms of post traumatic stress as 91% of the participants who had clinically significant post traumatic stress before EMDR treatment, no longer had clinically significant post traumatic stress at the follow-up measurement at the end of the study. This result is highly consistent with the findings of a randomised control study by Rothbaum (1997) who investigated the effects of EMDR on post traumatic stress and reported that 90% of participants no longer had clinically significant post traumatic stress following EMDR treatment. These results are also consistent with the findings of other randomised control studies that reported a significant reduction in symptoms of post traumatic stress with EMDR treatment (Renfrey and Spates, 1994; Vaughan et al, 1994; Wilson et al., 1995, 1997; Ironson

et al., 1995, 1997; Carlson et al, 1998; Lee et al, 2002; Rothbaum et al., 2005; Marcus, et al, 1997, 2004; Van der Kolk et al. 2007).

6.5.2 Effects of EMDR on anxiety disorder

In this research study, the term anxiety refers to the anxiety scale on the MCMI-III. The paired t-test for significant change suggested that there was a significant decrease in anxiety for all the participants between the measurement before EMDR treatment and after the treatment of one trauma, and between the measurement before EMDR treatment and at the end of EMDR treatment. The paired t-test for significant change also suggested that there was also a significant decrease in anxiety for all the participants between the measurement before EMDR treatment and the follow-up measurement at the end of the research study. In addition, the paired t-test for significant change suggested that there was no significant change in anxiety for all the participants between the measurement at the end of EMDR treatment and the follow-up measurement at the end of the research study, which means that gains achieved were maintained.

All of the 32 participants in this research study had clinically significant anxiety (≥ 75 on the MCMI-III anxiety scale) before EMDR treatment. After the treatment of one trauma using EMDR, 16 participants or 50% of the participants no longer reported clinically significant anxiety. At the end of the EMDR treatment, 24 participants no longer had clinically significant anxiety, which is 75% of the participants. At the follow-up measurement, 22 of the 32 participants no longer had clinically significant anxiety, which means that 69% of all the participants no longer had clinically significant anxiety at the end of the study.

The results of this research revealed that a significant decrease in symptoms of anxiety occurred with EMDR treatment. These results are consistent with the findings of other EMDR

research studies that also report a clinically significant decrease in anxiety (Marcus et al., 1997, 2004; Scheck et al., 1998; Edmond et al., 1999; Rothbaum et al., 2005), or a significant improvement in symptoms of anxiety (Rothbaum, 1997; Carlson, et al., 1998; Sprang, 2001). These results are consistent even though the symptoms of anxiety were measured on the MCMI-III in this study and on the STAI in the other studies.

The analysis of the associated syndromes of anxiety revealed that six of the 32 participants who had clinically significant anxiety, also had clinically significant dysthymia, post traumatic stress and major depression. After the treatment of one trauma using EMDR, only two had clinically significant anxiety and one of these participants also had clinically significant dysthymia, post traumatic stress and major depression. At the end of EMDR treatment, two participants had clinically significant anxiety and no other clinically significant clinical syndromes. At the follow-up measurement the same two participants still had clinically significant anxiety and one had clinically significant dysthymia.

Five of the 32 participants who had clinically significant anxiety also had clinically significant dysthymia and post traumatic stress. After the treatment of one trauma, four still had clinically significant anxiety, all five had clinically significant dysthymia and one had clinically significant post traumatic stress. At the end of treatment, three of the five participants still had clinically significant anxiety, four of the five still had clinically significant dysthymia and one participant still had clinically significant post traumatic stress disorder. Four participants attended the follow-up measurement and three of the four still had clinically significant anxiety and dysthymia, and one participant also had clinically significant post traumatic stress disorder and major depression.

Three of the 32 participants who had clinically significant anxiety also had clinically significant dysthymia and major depression. After the treatment of one trauma using EMDR, all three participants still had clinically significant anxiety and two had clinically significant

dysthymia. Two participants attended the follow-up measurement and no longer had any clinically significant clinical syndromes, while one participant had clinically significant anxiety and dysthymia.

Five of the 32 participants who had clinically significant anxiety also had clinically significant dysthymia. After the treatment of one trauma, three of the participant had clinically significant anxiety and two had clinically significant dysthymia. At the end of EMDR treatment, only one participant had clinically significant anxiety, dysthymia and major depression. However, at the follow-up measurement two participants had clinically significant anxiety and dysthymia, one participant had clinically significant anxiety and the other two participants had no clinically significant clinical syndromes.

Three of the 32 participants who had clinically significant anxiety also had clinically significant major depression. After the treatment of one trauma using EMDR, only one participant had clinically significant anxiety and no participant had major depression. At the end of treatment one participant had clinically significant dysthymia. Two participants attended the follow-up measurement, and one participant no longer had clinically significant syndromes while the other had clinically significant anxiety, dysthymia and major depression.

Ten of the 32 participants had clinically significant anxiety alone. After the treatment of the first trauma using EMDR, five of these ten participants no longer had clinically significant anxiety. At the end of treatment, eight of the ten participants no longer had clinically significant anxiety. At the follow-up measurement one of the participants had clinically significant anxiety and dysthymia, and the other had clinically significant anxiety.

In summary, the results of the analysis revealed that EMDR treatment is reasonably effective in reducing the symptoms of anxiety. All the participants had clinically significant anxiety before EMDR treatment and 69% of the participants no longer had clinically significant anxiety at the follow-up measurement at the end of the study. These results are

consistent with the findings of other EMDR research studies that also report a clinically significant decrease in anxiety (Marcus et al., 1997, 2004; Scheck et al., 1998; Edmond et al., 1999; Rothbaum et al., 2005), or a significant improvement in symptoms of anxiety (Rothbaum, 1997; Carlson, et al., 1998; Sprang, 2001) with EMDR treatment.

6.5.3 Summary of effects of EMDR on other clinical syndromes

The aim of this study was to investigate the effects of EMDR on other clinical syndromes on the MCMI-III, namely post traumatic stress and anxiety. The analysis of the results revealed that EMDR is effective in reducing the symptoms of post traumatic stress and reasonably effective in reducing anxiety as measured on the MCMI-III.

Eighty two percent of the participants who had clinically significant post traumatic stress disorder (≥ 75 on the MCMI-III post traumatic stress scale) before EMDR treatment, no longer had clinically significant post traumatic stress after the EMDR treatment of one trauma. At the end of EMDR treatment, 91% of these participants no longer had clinically significant post traumatic stress and these results were maintained at the follow-up measurement at the end of the study. The one participant who had clinically significant post traumatic stress at the end of the study was the combat veteran, and the researcher postulates that this is due to insufficient EMDR sessions and possible secondary gains. The results obtained in this study are highly consistent with the findings of other randomised control studies that reported a significant reduction in symptoms of post traumatic stress with EMDR treatment (Renfrey and Spates, 1994; Vaughan et al, 1994; Wilson et al., 1995, 1997; Ironson et al., 1995, 1997; Rothbaum, 1997; Carlson et al, 1998; Lee et al, 2002; Rothbaum et al., 2005; Marcus, et al, 1997, 2004; Van der Kolk et al. 2007).

All the participants had clinically significant anxiety before EMDR treatment. After the treatment of one trauma with EMDR, 50% percent of the participants no longer had

clinically significant anxiety. At the end of EMDR treatment, 75% of the participants no longer had clinically significant anxiety and these results were maintained by 69% of the participants at the follow-up measurement at the end of the study. The results obtained in this study are highly consistent with the findings of other randomised control studies that reported a significant reduction in symptoms of anxiety with EMDR treatment (Marcus et al., 1997, 2004; Scheck et al., 1998; Edmond et al., 1999; Rothbaum et al., 2005).

6.6 Discussion of effects of EMDR on severe clinical syndromes

This research study analysed the effects of EMDR on the three severe clinical syndromes, bipolar (manic), thought disorder and delusional disorder, and two dependence disorders, namely, alcohol and drug dependence on the MCMI-III. While the participants completed these scales on the MCMI-III, it must however be pointed out that none of the participants had a clinically significant severe clinical syndrome or dependence disorder (>75) on the MCMI-III before EMDR treatment, as a clinically significant score on these scales were part of the exclusion criteria. Therefore these results cannot be generalised to people who have clinically significant bipolar, thought disorder and delusional disorder, or to people who have clinically significant alcohol and drug dependence. However, a number of participants had a score within one standard deviation above the mean (60-74) on the MCMI-III. These results were considered as they may provide an indicator of how the severe syndromes and the dependence syndromes may respond to EMDR treatment. More research would be needed to establish whether EMDR is effective with clinically significant severe clinical syndromes and dependence disorders.

In this research study, the term bipolar refers to the bipolar (manic) scale on the MCMI-III. The paired t-test for significant change suggested that there was no significant

decrease in bipolar for all the participants between the measurement before EMDR treatment and after the treatment of one trauma, between the measurement before EMDR treatment and at the end of EMDR treatment, and between the measurement before EMDR treatment and the follow-up measurement at the end of the research study.

Before EMDR treatment, 19 of the 32 participants in the study (59% of all the participants) had a score between 60 and 74, or within one standard deviation above the mean, on the bipolar (manic) scale on the MCMI-III. After the treatment of one trauma with EMDR the scores for ten of these 19 participants (53% of these participants) had reduced to below the mean (<60). At the end of the EMDR treatment, or after treatment of multiple traumas, the scores of six of these 19 participants (32% of these participants) had reduced to below the mean (<60). At the follow-up measurement at the end of the research study, the scores for ten of these 19 participants (53% of these participants) remained below the mean (<60) on the bipolar (manic) scale.

Bipolar is a complex condition that is treated mainly with a combination of psychotropic medication and psychotherapy, such as cognitive behaviour therapy. The results on the MCMI-III bipolar scale following EMDR treatment in this study revealed that EMDR treatment did not significantly reduce the bipolar symptoms after the treatment of one trauma, at the end of EMDR treatment or at follow-up. Therefore, one may conclude that EMDR treatment may not be suggested as a treatment to reduce bipolar symptoms. However, there was a reduction in bipolar (manic) symptoms in more than half of the participants who had a score of within one standard deviation above the mean before EMDR treatment. Nevertheless these results cannot be generalised to people with clinically significant bipolar (manic) disorder because no participants in this study had a clinically significant score on the bipolar scale before EMDR treatment. In addition, the results of this study cannot be compared to other studies because to date there has been no empirical research into the effects of EMDR

treatment with bipolar disorders. More research is needed to establish the effect of EMDR on people with clinically significant bipolar disorder.

In this research study, the term thought disorder refers to the thought disorder scale on the MCMI-III. The paired t-test for significant change suggested that there was a significant decrease in symptoms on the thought disorder scale for all the participants between the measurement before EMDR treatment and after the treatment of one trauma, between the measurement before EMDR treatment and at the end of EMDR treatment, and between the measurement before EMDR treatment and the follow-up measure at the end of the research study. However, the paired t-test for significant change suggested that there was no significant change on the thought disorder scale for all the participants between the measurement at the end of EMDR treatment and the follow-up measurement at the end of the research study, which means the gains achieved were maintained.

Before EMDR treatment, 27 of the 32 participants in the study (84% of all the participants) had a score between 60 and 74, or within one standard deviation above the mean, on the thought disorder scale on the MCMI-III. After the treatment of one trauma with EMDR, the scores for 16 of these 27 participants (59% of these participants) had reduced to below the mean (<60). At the end of the EMDR treatment or after the treatment of multiple traumas, the scores of 18 of these 27 participants (67% of these participants) had reduced to below the mean (<60). At the follow-up measurement at the end of the research study, the scores for 17 of these 27 participants (63% of these participants) remained below the mean (<60) on the thought disorder scale on the MCMI-III.

To date no research has been conducted on the effects of EMDR treatment on thought disorder as measured by the MCMI-III. Therefore the researcher was unable to compare the results of this study with other research studies. The results of this study seem to indicate that

more than 60% of the participants, who had a score within one standard deviation above the mean on the MCMI-III (60-74), experienced a reduction in their symptoms of thought disorder to below the mean (<60). These results are unique and offer new findings to EMDR research. However, these results cannot be generalised to a population with clinically significant thought disorder because none of the participants in this study had clinically significant thought disorder before EMDR treatment. More research is needed to establish the effectiveness of EMDR treatment in reducing the symptoms of thought disorder in people with clinically significant thought disorder.

In this research study, the term delusional disorder refers to the delusional disorder scale on the MCMI-III. The paired t-test for significant change suggested that there was a significant decrease in symptoms on the delusional disorder scale for all the participants between the measurement before EMDR treatment and after the treatment of one trauma, and between the measurement before EMDR treatment and at the end of EMDR treatment. The paired t-test for significant change also suggested that the decrease in symptoms of delusional disorder was not clinically significant between the measurement before EMDR treatment and the follow-up measurement at the end of the research study, and between the measurement at the end of EMDR treatment and the follow-up measurement at the end of the research study.

Before EMDR treatment, nine of the 32 participants in the study (28% of all the participants) had a score between 60 and 74, or within one standard deviation above the mean, on the delusional disorder scale on the MCMI-III. After the treatment of one trauma with EMDR, the scores for eight of these nine participants (89% of these participants) had reduced to below the mean (<60). At the end of the EMDR treatment or after the treatment of multiple traumas, the scores of seven of these nine participants (78% of these participants) had reduced to below the mean (<60). At the follow-up measurement at the end of the

research study, the scores for six of these nine participants (67% of these participants) remained below the mean (<60) on the delusional disorder scale on the MCMI-III.

To date no research has been conducted on the effects of EMDR treatment on delusional disorder as measured by the MCMI-III, so the researcher was unable to compare the results of this study with other research studies. Therefore the findings of this study are unique and offer new assumptions to EMDR research. The results of this study seem to indicate that 67% of the participants, who had a score within one standard deviation above the mean on the MCMI-III (60-74), experienced a reduction in their symptoms of delusional disorder to below the mean (<60). However, these results cannot be generalised to people with clinically significant delusional disorder because no participants had clinically significant delusional disorder before EMDR treatment. Therefore, more research is needed to establish the effectiveness of EMDR treatment in reducing the symptoms of delusional disorder in people with clinically significant delusional disorder.

In this research study, the term alcohol dependence refers to the alcohol dependence scale on the MCMI-III. The paired t-test for significant change suggested that there was a significant decrease in symptoms for alcohol dependence for all the participants between the measurement before EMDR treatment and after the treatment of one trauma. Although there was a decrease in scores on the alcohol dependence scale on the MCMI-III between the measurement before EMDR treatment and at the end of EMDR treatment, and between the measurement before EMDR treatment and the follow-up measurement at the end of the research study, this decrease was not clinically significant at the .01 level but tended towards significance at the .05 level ($p < .05$). The analysis between the measurement at the end of EMDR treatment and the follow-up measurement at the end of the research study suggested

that there was no significant change on the alcohol dependence scale for all the participants, which means that the gains achieved were maintained.

Before EMDR treatment, 25 of the 32 participants in the study (78% of all the participants) had a score between 60 and 74, or within one standard deviation above the mean, on the alcohol dependence scale on the MCMI-III. After the treatment of one trauma with EMDR, the scores for 12 of these 25 participants (48% of these participants) had reduced to below the mean (<60). At the end of the EMDR treatment or after the treatment of multiple traumas, the scores of seven of these 25 participants (28% of these participants) had reduced to below the mean (<60). At the follow-up measurement at the end of the research study, the scores for 12 of these 25 participants (48% of these participants) remained below the mean (<60) on the alcohol dependence scale on the MCMI-III.

Alcohol dependence is a complex condition. The results of this study seem to indicate that 48% of the participants, who had a score within one standard deviation above the mean on the MCMI-III (60-74), experienced a reduction in their symptoms of alcohol dependence to below the mean (<60). However the results of this study cannot be generalised to people with clinically significant alcohol dependence because no participants in this study had a clinically significant alcohol dependence before EMDR treatment. In addition, the results of this study cannot be compared to other studies because to date there has been no randomised control studies into the effects of EMDR treatment with alcohol dependence. Shapiro (2001) advises that if a person underwent EMDR treatment, then the person should have sufficient support in place, such as a 12-step program designed for alcohol dependence. This is because some people consume alcohol to dampen the affects of disturbing memories and the urge to consume alcohol may increase with EMDR treatment because disturbing material is stimulated in treatment. EMDR has proven useful in identifying triggers associated with the urge to drink alcohol and reducing the strength of these urges, which may then lead to a

reduction in the consumption of alcohol (Richman, 2003). To date EMDR treatment is not suggested as a treatment for alcohol dependence, and more research is needed to establish the effects of EMDR with alcohol dependence.

In this research study, the term drug dependence refers to the drug dependence scale on the MCMI-III. The paired t-test for significant change suggested that the decrease in symptoms of drug dependence was not clinically significant for all the participants between the measurement before EMDR treatment and after the treatment of one trauma. However, while the decrease in symptoms of drug dependence between the measurement before EMDR treatment and at the end of EMDR treatment was not clinically significant at the .01 level, it tended towards significance at the .05 level ($p < .05$). In addition, the decrease on drug dependence scale on the MCMI-III was not clinically significant between the measurement before EMDR treatment and the follow-up measurement at the end of the research study, and between the measurement at the end of EMDR treatment and the follow-up measurement at the end of the research study.

Before EMDR treatment, 14 of the 32 participants in the study (44% of all the participants) had a score between 60 and 74, or within one standard deviation above the mean, on the drug dependence scale on the MCMI-III. After the treatment of one trauma with EMDR, the scores for five of these 14 participants (36% of these participants) had reduced to below the mean (<60). At the end of the EMDR treatment or after the treatment of multiple traumas, the scores of four of these 14 participants (29% of these participants) had reduced to below the mean (<60). At the follow-up measurement at the end of the research study, the scores for eight of these 14 participants (57% of these participants) remained below the mean (<60) on the drug dependence scale on the MCMI-III.

To date no randomised control studies have been conducted on the effects of EMDR treatment on drug dependence, so the researcher was unable to compare the results of this study with other research studies. The results of this study indicate that at the end of EMDR treatment, 29% of participants with elevated score on the drug dependence scale had experienced a reduction in symptoms but this increased to 57% of the participants by the follow-up measurement. This may suggest that there was a roll on effect after EMDR treatment and the symptoms of the drug dependence continued to improve after EMDR treatment. However, these results cannot be generalised to people with clinically significant drug dependence because no participants in this study had clinically significant drug dependence before EMDR treatment. More research is needed in the future with people with clinically significant drug dependence to establish whether EMDR treatment is effective in the reducing drug dependence and in what way EMDR is effective in drug dependence.

6.6.1 Summary of effects of EMDR on severe clinical syndromes

This research analysed the effects of EMDR on the severe clinical syndromes, bipolar, thought disorder and delusional disorder, and alcohol and drug dependence. Even though the participants did not have a clinically significant score on the severe clinical syndrome and dependence scale on the MCMI-III before EMDR treatment, a considerable number of participants had a score on the severe clinical syndrome and dependence scales on the MCMI-III that fell within one standard deviation above the mean (60-74).

The analysis of the results of the participants with a score within one standard deviation above the mean (60-74) on the severe clinical syndrome scales on the MCMI-III, revealed that after the treatment of one trauma the scores reduced to below the mean (<60) for 53% of participants with bipolar, for 59% of participants with thought disorder, and 89% for participants with delusional disorder. The analysis of the results of the participants with a

score within one standard deviation above the mean (60-74) on the severe clinical syndrome scales on the MCMI-III, revealed that at the end of EMDR treatment the scores on the MCMI-III reduced to below the mean (<60) for 32% of participants with bipolar, for 67% of participants with thought disorder, and 78% of participants with delusional disorder. The analysis of the results of the participants with a score within one standard deviation above the mean (60-74) on the severe clinical syndrome scales on the MCMI-III at the follow-up measurement at the end of the study revealed that the scores reduced to below the mean (<60) for 53% of participants with bipolar, for 63% of participants with thought disorder, and 67% for participants with delusional disorder. However, these results cannot be generalised to a population with clinically significant bipolar, thought disorder and delusional disorder before EMDR treatment.

The analysis of the results of the participants with a score within one standard deviation above the mean (60-74) on the dependence scales on the MCMI-III, revealed that after the treatment of one trauma the scores reduced to below the mean (<60) for 48% of participants with alcohol dependence and 36% for participants with drug dependence. The analysis of the results of the participants with a score within one standard deviation above the mean (60-74) on the dependence scales on the MCMI-III, revealed that at the end of EMDR treatment the scores reduced to below the mean (<60) for 28% of participants with alcohol dependence and 29% for participants with drug dependence. The analysis of the results of the participants with a score within one standard deviation above the mean (60-74) on the dependence scales on the MCMI-III at the follow-up measurement at the end of the study revealed that the scores reduced to below the mean (<60) for 48% of participants with alcohol dependence and 57% for participants with drug dependence. However, these results cannot be generalised to a population with clinically significant alcohol and drug dependence before EMDR treatment.

6.7 Discussion of effects of EMDR on dissociation

One of the aims of this research study was to investigate the effects of EMDR on dissociation. The symptoms of dissociation were measured using the Dissociative Experience Scale II (DES-II). The paired t-test for significant change suggested that there was a significant decrease in dissociation for all the participants between the measurement before EMDR treatment and after the treatment of one trauma, and between the measurement before EMDR treatment and at the end of EMDR treatment. The paired t-test for significant change also suggested that there was also a significant decrease in dissociation for all the participants between the measurement before EMDR treatment and the follow-up measurement at the end of the research study. In addition, the paired t-test for significant change suggested that there was no significant change in dissociation for all the participants between the measurement at the end of EMDR treatment and the follow-up measurement at the end of the research study, which means that gains achieved were maintained.

Most of the previous research into the effect of EMDR treatment on dissociation has occurred as secondary measures in randomised control studies investigating the effects of EMDR treatment on post traumatic stress (Rothbaum, 1997; Taylor et al., 2003; Rothbaum et al., 2005). These studies reported that EMDR treatment significantly reduces dissociation (Rothbaum, 1997; Taylor et al., 2003; Rothbaum et al., 2005). The results of the current study are consistent with the results of previous studies because the current study also found that EMDR treatment significantly reduces the symptoms of dissociation.

6.8 Discussion of effects of number of EMDR treatment sessions on treatment outcomes

6.8.1 Mean number of session per trauma

The treatment of the first trauma using EMDR included one relaxation session and the rest were eye movement sessions. The mean number of sessions to treat the first trauma was 7.66 sessions. The mean reduced to 6.3 sessions for the treatment of the second trauma, and this reduced even further to three sessions for the treatment of the third trauma. However, these results are not generalisable because of the small sample size of participants who completed the full EMDR protocol treatment for the second and third trauma.

Four participants underwent EMDR treatment for adult physical assault and the mean number of EMDR sessions to reduce the subjective unit of disturbance (SUD) was 4.75 sessions. Three participants underwent EMDR treatment for domestic abuse and the mean number of EMDR sessions to reduce the SUD to zero was 6.6 sessions per trauma. One participant underwent EMDR treatment for a childhood sexual assault (violent degrading rape) and the SUD was reduced to zero in seven sessions using EMDR. Two participants underwent EMDR treatment for childhood sexual abuse (fondling) and the mean number of sessions to reduce the SUD to zero was 5.5 sessions. One participant had experienced a severe burn at the age of four years old and his SUD for this incidence was reduced to zero in six sessions. Two participants underwent EMDR for childhood bullying in which they experienced severe physical assault and the mean number of sessions to reduce the SUD to zero was 6.5 sessions. Three participants had experienced bullying in adulthood and the mean number of sessions to reduce the SUD to zero using EMDR was 3.3 sessions. Five participants underwent EMDR for being involved in life threatening road traffic accidents and the mean number of sessions to reduce the SUD to zero was nine sessions. Two participants had witnessed fatal road traffic accidents and the mean number of sessions to reduce the SUD to zero was 11.5 sessions. Four participants had endured the death of a relative and their mean number of sessions to reduce the SUD to zero was 7.5 sessions. Four participants

underwent EMDR following a traumatic birth and the mean number of sessions to reduce the SUD to zero was 8.75 sessions. Two participants had undergone a termination of pregnancy and the mean number of sessions to reduce the SUD to zero was 3.5 sessions. Seven participants reported relationship difficulties and the mean number of sessions to reduce to SUD to zero was 6.4 sessions.

6.8.2 Participants with the most sessions

The highest mean number of sessions for a trauma pertained to a participant who came home to find that her husband had hanged himself, after which, an inconclusive ruling of suicide was made. After 18 sessions of EMDR for her husband's death, she was able to speak about his death for the first time in six years. However, there was little reduction in the guilt she felt and there was no reduction in her overall clinical syndromes. The researcher therefore postulates that the amount of EMDR sessions does not necessarily correlate to the reduction of disturbance because in this study the highest amount of EMDR sessions did not reduce the subjective unit of disturbance to zero.

The participant with the second highest number of sessions was a lady who had been injured in a head on collision. Sixteen sessions was necessary to reprocess the different parts of the traumatic memory, including the impact itself, being cut out of her car, the operations and hospitalisation, and her inability to continue in her full time job after the accident. It is the opinion of the researcher that there was a feeder memory underpinning the disturbance of the memory of the road traffic accident (Richman, 2004). This feeder memory was likely her sexual abuse as a child. The abuse only took seven sessions to reprocess. The researcher believes that fewer sessions may have been required to process the road traffic accident if the childhood memories were reprocessed first.

The participant with the third highest number of sessions was a combat veteran, with 12 sessions per trauma. The veteran had fought in the Falklands, the Gulf war in the 1990s and in Ireland. This participant chose first to desensitise his memories of the Falkland war using EMDR. These memories were thoroughly desensitised during the 12 sessions and the participant was able to find relief for his traumatic memories. During the treatment of the memories of the Gulf war, the participant chose to reprocess three related memories. The researcher suggested the target for the third trauma should be witnessing the death of his sister in their home shortly after childbirth. After one session of EMDR on the third target, the participant experienced extreme panic attacks and did not return for more EMDR. On reflection, the researcher should have perhaps let the veteran choose his own target for the third trauma.

6.8.3 Participants with the least sessions

Two participants only underwent two sessions of treatment. The first of these sessions was a relaxation session and the second was an eye movement session. One of the participants was involved in a road traffic accident and he reported that his subjective unit of disturbance had reduced to zero for all the memories related to the accident in one session. The other participant explained that her mind continued to race after the EMDR sessions, to the point where she could no longer tolerate the speed of the racing. Her GP prescribed benzodiazepine, after which she reported that her subjective unit of disturbance had reduced to zero for her memories of domestic violence. Even at her follow-up measure, her subjective unit of disturbance had not increased nor had her clinical syndromes.

6.9 Summary of findings of this research study

This study investigated the effects of EMDR on clinical personality patterns; schizoid, avoidant, depressive, dependent, histrionic, narcissistic, antisocial, sadistic, compulsive, negativistic and masochistic, on the MCMI-III.

The analysis of the schizoid, avoidant, depressive, dependent, antisocial, sadistic, negativistic and masochistic personality patterns on the MCMI-III, revealed that whilst there was a clinically significant decrease schizoid, avoidant, depressive, dependent, sadistic, negativistic and masochistic personality pattern, the decrease in antisocial personality pattern was not clinically significant at the .01 level but tended towards significance (i.e., $p < .05$), after the EMDR treatment of one trauma, and between the measurement before EMDR treatment and the measurement at the end of the EMDR treatment. The data analysis of all the participants also revealed that whilst there was a significant decrease in avoidant, depressive, dependent, antisocial, sadistic, negativistic and masochistic personality pattern on the MCMI-III, the decrease in schizoid personality pattern was not clinically significant at the .01 level but tended towards significance (i.e., $p < .05$) between the first measurement before the EMDR treatment and at the follow-up measurement at the end of the study.

The participants with clinically significant dependent personality pattern on the MCMI-III (>75) before EMDR treatment, reported the greatest reduction in symptoms of dependent personality pattern, compared to schizoid personality pattern where the participants reported the least reduction in schizoid personality pattern at the follow-up measurement at the end of the study.

The analysis of the clinical personality patterns on the MCMI-III revealed that 53% of participants with dependent personality pattern on the MCMI-III no longer had a clinically significant score (>75) following EMDR treatment of one trauma; with the extent of the reduction in clinically significant scores for participants with other personality patterns being

56% for masochistic personality pattern, 54% for negativistic personality pattern, 54% for avoidant personality pattern, 33% for depressive personality pattern and 42% for schizoid personality pattern.

The analysis of the clinical personality patterns on the MCMI-III at the end of the EMDR treatment revealed that 76% of participants with dependent personality pattern on the MCMI-III no longer had a clinically significant score (>75); with the extent of the reduction in clinically significant scores for participants with other personality patterns being 75% for masochistic personality pattern, 77% for negativistic personality pattern, 69% for avoidant personality pattern, 40% for depressive personality pattern and 29% for schizoid personality pattern.

The analysis of the clinical personality patterns on the MCMI-III at the follow-up measurement at the end of the study revealed that 76% of participants with dependent personality pattern on the MCMI-III no longer had a clinically significant score (>75); with the extent of the reduction in clinically significant scores for participants with other personality patterns being 64% for masochistic personality pattern, 46% for negativistic personality pattern, 38% for avoidant personality pattern, 33% for depressive personality pattern and 29% for schizoid personality pattern.

The analysis of the compulsive, histrionic and narcissistic personality patterns on the MCMI-III revealed a clinically significant increase in narcissistic and histrionic personality patterns between the measurement before EMDR treatment and the measurement at the end of the study. While the increase in compulsive personality pattern between the measurement before EMDR treatment and the measurement at the end of the study was not clinically significant at the .01 level, it tended towards significance (i.e., $p < .05$). According to Craig (2008), elevated scores on the compulsive, histrionic and narcissistic personality pattern

scales on the MCMI-III are negative correlated with psychiatric conditions and positive correlated with measures of mental health and a healthy adaptive personality style, as elevated scores are seen in nonclinical populations such as air force pilots in basic training.

The analysis of all the participants in this study revealed that participants with six clinically significant personality patterns, namely, schizoid, avoidant, depressive, dependent, masochistic and negativistic, tended to have the least reduction in personality symptoms with EMDR treatment. The participants who had two to five clinically significant personality patterns tended to have variations of; schizoid, avoidant, depressive, dependent, masochistic and negativistic, with varying reductions in symptoms. Participants with a clinically significant personality pattern; depressive, dependent, masochistic and negativistic seemed to respond best to EMDR and they maintained their gains at the follow-up measurement. Participants with only one clinically significant personality pattern, such as schizoid and avoidant, had a considerable reduction in their personality symptoms following EMDR treatment. Therefore one could conclude that the less clinically significant personality patterns a person reports on the MCMI-III, the greater the reduction in personality patterns the person is likely to experience with EMDR treatment.

A summary of the results of the effects of EMDR treatment on severe personality patterns revealed that there was a clinically significant reduction for all participants in the schizotypal, borderline and paranoid severe personality pattern on the MCMI-III following the EMDR treatment of one trauma and at the end of EMDR treatment. The gains were maintained at the follow-up measurement at the end of the study. Although the participants did not have a clinically significant severe personality score on the MCMI-III before EMDR

treatment, a considerable number of participants had a score on the severe personality scales on the MCMI-III that fell within one standard deviation above the mean (60-74).

The results of the analysis revealed 66% of all the participants had a score within one standard deviation above the mean (60-74) on the schizotypal severe personality pattern scale on the MCMI-III. The score reduced from within one standard deviation above the mean (60-74) to below the mean (<60) on the schizotypal severe personality pattern on the MCMI-III for 38% of these participants after the EMDR treatment of one trauma, for 52% of these participants at the end of EMDR treatment, and the gains were maintained by 48% of these participants at the follow-up.

The results of the analysis revealed 59% of all the participants had a score within one standard deviation above the mean (60-74) on the borderline severe personality pattern scale on the MCMI-III. The score reduced from within one standard deviation above the mean (60-74) to below the mean (<60) on the borderline severe personality pattern on the MCMI-III for 79% of these participants after the EMDR treatment of one trauma, for 84% of these participants at the end of EMDR treatment, and the gains were maintained by 84% of these participants at follow-up. However at the end of the study, one additional participant reported an increase in his borderline personality pattern score on the MCMI-III.

The results of the analysis revealed 72% of the participants had a score within one standard deviation above the mean (60-74) on the paranoid severe personality pattern scale on the MCMI-III. The score reduced from within one standard deviation above the mean (60-74) to below the mean (<60) on the paranoid severe personality pattern on the MCMI-III for 52% of these participants after the EMDR treatment of one trauma, for 68% of these participants at the end of EMDR treatment, and the gains were maintained by 68% of these participants at follow-up. In addition, one additional participant reported an increase in his paranoid personality pattern score at the end of the study.

A summary of the analysis of the results of the depressive constructs indicate that EMDR treatment is most effective in reducing symptoms of major depression followed by dysthymia, but was least effective in reducing symptoms depressive personality pattern.

The analysis of the results revealed that EMDR treatment was effective in reducing the symptoms of major depression on the MCMI-III, as 92% of the participants with clinically significant major depression before the EMDR treatment no longer had clinically significant major depression after the treatment of one trauma. At the end of EMDR treatment, 86% of these participants no longer reported clinically significant major depression, and all these participants maintained their gains at the follow-up measurement at the end of the study. Clinically significant major depression on the MCMI-III (>75) seems to be a indicator of a good prognosis with EMDR treatment.

The results of the analysis revealed that 47% of the participants with clinically significant dysthymia on the MCMI-III before EMDR treatment no longer reported clinically significant dysthymia after the treatment of the first trauma using EMDR. At the end of EMDR treatment, 73% of these participants no longer had a clinically significant dysthymia, and 58% of these participants maintained their gains at the follow-up measurement at the end of the study.

The results of the analysis revealed that the participants with clinically significant depressive personality pattern before EMDR treatment experienced the least reduction in symptoms compared to major depression and dysthymia, as only 33% of these participants no longer reported clinically significant depressive personality after the EMDR treatment of the one trauma using EMDR. At the end of EMDR treatment, 40% of these participants no longer had a clinically significant depressive personality, and 33% of these participants maintained their gains at the follow-up measurement at the end of the study.

A summary of the analysis of the results of the effects of EMDR on other clinical syndromes indicates that EMDR treatment is effective in reducing the symptoms of post traumatic stress, as 91% of the participants who had clinically significant post traumatic stress before EMDR treatment, no longer had clinically significant post traumatic stress at the follow-up measurement at the end of the study. This result is highly consistent with the findings of a randomised control study by Rothbaum (1997) which investigated the effects of EMDR on post traumatic stress and reported that 90% of participants no longer had clinically significant post traumatic stress following EMDR treatment. The results are also consistent with the findings of other randomised control studies that reported a significant reduction in symptoms of post traumatic stress with EMDR treatment (Renfrey and Spates, 1994; Vaughan et al, 1994; Wilson et al., 1995, 1997; Ironson et al., 1995, 1997; Carlson et al, 1998; Lee et al, 2002; Rothbaum et al., 2005; Marcus, et al, 1997, 2004; Van der Kolk et al. 2007).

All the participants in this study had clinically significant anxiety before EMDR treatment. After the treatment of one trauma with EMDR, 50% percent of the participants no longer had clinically significant anxiety. At the end of EMDR treatment, 75% of the participants no longer had clinically significant anxiety and these results were maintained by 69% of the participants at the follow-up measurement at the end of the study. The results obtained in this study are highly consistent with the findings of other randomised control studies that reported a significant reduction in symptoms of anxiety with EMDR treatment (Marcus et al., 1997, 2004; Scheck et al., 1998; Edmond et al., 1999; Rothbaum et al., 2005).

This study analysed the results of the severe clinical syndromes, bipolar, thought disorder and delusional disorder, and the alcohol and drug dependence scales on the MCMI-III following EMDR treatment. However, it should be noted that no participants had a

clinically significant score on these scales on the MCMI-III (>75) before EMDR treatment, as this was part of the exclusion criteria. So these results cannot be generalised to a population with clinically significant severe syndromes and dependence disorders. But these results may provide an indicator of the effects of EMDR treatment with these syndromes, which could be investigated in future research.

The results of the analysis revealed 59% of the participants had a score within one standard deviation above the mean (60-74) on the bipolar (manic) scale on the MCMI-III. The score reduced from within one standard deviation above the mean (60-74) to below the mean (<60) on the bipolar (manic) scale on the MCMI-III for 53% of these participants after the EMDR treatment of one trauma, for 32% of these participants at the end of EMDR treatment, and the gains were maintained by 53% of these participants at follow-up.

The results of the analysis revealed 84% of the participants had a score within one standard deviation above the mean (60-74) on the thought disorder scale on the MCMI-III. The score reduced from within one standard deviation above the mean (60-74) to below the mean (<60) on the thought disorder on the MCMI-III for 59% of these participants after the EMDR treatment of one trauma, for 67% of these participants at the end of EMDR treatment, and the gains were maintained by 63% of these participants at follow-up.

The results of the analysis revealed 28% of the participants had a score within one standard deviation above the mean (60-74) on the delusional disorder scale on the MCMI-III. The score reduced from within one standard deviation above the mean (60-74) to below the mean (<60) on the delusional disorder on the MCMI-III for 89% of these participants after the EMDR treatment of one trauma, for 78% of these participants at the end of EMDR treatment, and the gains were maintained by 67% of these participants at follow-up.

The results of the analysis revealed 78% of the participants had a score within one standard deviation above the mean (60-74) on the alcohol dependence scale on the MCMI-III.

The score reduced from within one standard deviation above the mean (60-74) to below the mean (<60) on the alcohol dependence scale on the MCMI-III for 48% of these participants after the EMDR treatment of one trauma, for 28% of these participants at the end of EMDR treatment, and the gains were maintained by 48% of these participants at follow-up.

The results of the analysis revealed 44% of the participants had a score within one standard deviation above the mean (60-74) on the drug dependence scale on the MCMI-III. The score reduced from within one standard deviation above the mean (60-74) to below the mean (<60) on the drug dependence scale on the MCMI-III for 36% of these participants after the EMDR treatment of one trauma, for 28% of these participants at the end of EMDR treatment, and the gains were maintained by 57% of these participants at follow-up.

The study also analysed the effects of EMDR on dissociation as measured on the DES-II. The results of the analysis revealed that there was a significant decrease in dissociation for all the participants after the EMDR treatment of one trauma, at the end of EMDR treatment, and at follow-up measurement at the end of the research study. In addition, the analysis revealed that the reduction in dissociation was maintained between the measurement at the end of the EMDR treatment and at the end of the study. The results of this study are consistent with the results of other studies that reported a significant decrease in symptoms of dissociation after EMDR treatment (Rothbaum, 1997; Taylor et al., 2003; Rothbaum et al., 2005).

Chapter 7: Conclusions and implications

This chapter will discuss the conclusions and implications of this research study. Firstly this chapter will discuss the conclusions of the research into the effects of EMDR treatment on clinical personality patterns and severe personality patterns on the MCMI-III and the implications for future research. The chapter will then discuss the conclusions of the research into the effects of EMDR treatment on different depressive constructs, namely major depression, dysthymia and depressive personality, and the implications for future research. This will be followed by the conclusion and implications of the research into the effects of EMDR treatment on other clinical syndromes, post traumatic stress and anxiety, and the severe clinical and dependence syndromes. The chapter will also discuss the conclusions and implications of the findings of this research into the effects of EMDR on dissociation and the number of sessions needed per trauma. Lastly this chapter will outline the future benefits of this study.

7.1 Conclusion on effects of EMDR on clinical personality patterns

This study investigated the effects of EMDR on clinical personality patterns; schizoid, avoidant, depressive, dependent, histrionic, narcissistic, antisocial, sadistic, compulsive, negativistic and masochistic, as measured on the MCMI-III.

The analysis of this study revealed that people with clinically significant dependent personality pattern on the MCMI-III (>75) experienced the greatest reduction in symptoms with EMDR treatment. Of the participants who had clinically significant dependent personality pattern before EMDR treatment, 76% no longer reported clinically significant scores on the MCMI-III (>75) at the follow-up measurement at the end of the study. This result is consistent with Shapiro (2007) who postulated that a comprehensive reorganisation may occur as a result of the effective processing of critical early life events using EMDR and

this may be reflected in changes in characteristics of personality. Further research is needed to establish whether it can be predicted that 76% of all participants with clinically significant dependent personality pattern on the MCMI-III who undergo EMDR treatment will experience a significant reduction in these symptoms. In addition, a randomised control study needs to be conducted to compare the effects of EMDR on dependent personality pattern with another form of psychological therapy such as CBT.

The analysis of this study revealed that people with clinically significant masochistic (self-defeating) personality pattern on the MCMI-III (>75) experienced the second largest reduction in symptoms with EMDR treatment. Of the participants who had clinically significant masochistic (self-defeating) personality pattern before EMDR treatment, 64% no longer reported clinically significant scores on the MCMI-III (>75) at the follow-up measurement at the end of the study. This result is also consistent with Shapiro (2007) who postulated that a comprehensive reorganisation may occur as a result of the effective processing of critical early life events using EMDR, which may be reflected in changes in characteristics of personality. Further research is also needed to verify whether it can be predicted that 64% of all participants with clinically significant masochistic personality pattern who undergo EMDR treatment will experience a significant reduction in these symptoms. A randomised control study is also needed to compare the effects of EMDR on masochistic personality pattern with another form of psychological therapy such as CBT.

The analysis of this study revealed that 46% of participants who had clinically significant negativistic personality pattern on the MCMI-III (>75) before EMDR treatment no longer reported clinically significant scores on the MCMI-III (>75) at the follow-up measurement at the end of the study. The negativistic personality pattern on the MCMI-III is seen as a severe psychiatric condition and the results of this study needs to be verified to establish whether it can be predicted that 46% of all participants with clinically significant

negativistic personality pattern on the MCMI-III who undergo EMDR treatment will experience a significant reduction in these symptoms. In addition, a randomised control study needs to be conducted to compare the effects of EMDR on negativistic personality pattern with another form of psychological therapy such as CBT.

In the analysis of this study, 38% of participants who had clinically significant avoidant personality pattern on the MCMI-III (>75) before EMDR treatment no longer reported clinically significant scores on the MCMI-III (>75) at the follow-up measurement at the end of the study. This result also needs to be verified to establish whether it can be predicted that 38% of all participants with clinically significant avoidant personality pattern who undergo EMDR treatment will experience a significant reduction in these symptoms. Also a randomised control study needs to be conducted to compare the effects of EMDR on avoidant personality pattern with another form of psychological therapy such as CBT.

In the analysis of this study, both of the two participants who had clinically significant sadistic personality pattern on the MCMI-III (>75) before EMDR treatment no longer reported clinically significant scores on the MCMI-III (>75) at the follow-up measurement at the end of the study. While this result may suggest that 100% of participants experienced a clinically significant reduction in sadistic personality pattern, this result cannot be generalised as the sample is too small. Research needs to be conducted to establish more accurately the effects of EMDR on sadistic personality pattern. A randomised control study also needs to be conducted to compare the effects of EMDR on sadistic personality pattern with another form of psychological therapy such as CBT.

The one participant who had clinically significant antisocial personality pattern on the MCMI-III (>75) before EMDR treatment no longer reported clinically significant scores on the MCMI-III (>75) at the follow-up measurement at the end of the study. However, another participant who had clinically significant antisocial personality pattern at the end of the study

did not have a clinically significant score before EMDR treatment. In addition, the analysis of all the participants between the measurement before EMDR treatment and after the treatment of one trauma, and between the measurement before EMDR treatment at the end of the EMDR treatment revealed that the decrease in antisocial personality pattern was not significant at the .01 level but tended towards significance at the .05 level ($p < .05$), whilst the analysis between the measurement before EMDR treatment and the measurement at the follow-up measurement suggested there was a significant decrease in antisocial personality pattern. Future research would need to be conducted to establish the effects of EMDR on antisocial personality pattern more accurately, as one cannot draw a clear conclusion from the analysis of antisocial personality pattern from the findings of this study. A randomised control study also needs to be conducted to compare the effects of EMDR treatment on antisocial personality pattern with another form of psychological therapy, such as CBT.

The analysis of this study revealed that the depressive personality pattern on the MCMI-III had the second lowest reduction in symptoms with EMDR treatment. The results suggested that only 33% of participants with clinically significant depressive personality pattern before EMDR treatment experienced a clinically significant reduction in the scores on the depressive personality scale on the MCMI-III at the follow-up measurement at the end of the study. In addition, the analysis between the measurement at the end of EMDR treatment and at the end of the study revealed that whilst the increase in depressive personality pattern was not significant at the .01 level, it tended towards significance (i.e., $p < .05$), which means that there was an increase in depressive personality pattern after EMDR treatment and the gains were not well maintained. More research is needed to establish whether depressive personality pattern is resistant to EMDR treatment and to establish more robustly the effects of EMDR on the depressive personality pattern on the MCMI-III. A randomised control study also needs to be conducted to compare the effects of EMDR on depressive personality

pattern with another form of psychological therapy, such as CBT, to establish whether depressive personality is resilient to EMDR treatment alone or whether depressive personality is resilient to other forms of treatment too.

The analysis of this study revealed that the schizoid personality pattern had the lowest reduction in symptoms with EMDR treatment compared to all the other personality patterns under investigation. This indicates that EMDR is least effective with schizoid personality pattern on the MCMI-III. The results indicate that only 29% of the participants with a clinically significant schizoid personality pattern before EMDR treatment no longer had a clinically significant schizoid personality pattern at the end of the study. Furthermore, 57% additional participants reported a clinically significant schizoid personality pattern at the end of the study but these participants did not have clinically significant schizoid personality pattern before EMDR treatment. Future research is needed to establish whether only 29% of participants with schizoid personality pattern experience a clinically significant reduction in this personality pattern on the MCMI-III with EMDR treatment. Further research is also needed to establish why so few participants experienced a decrease in their schizoid personality pattern on the MCMI-III. Further research is needed to establish why schizoid personality pattern seems resistant to EMDR treatment, and why certain people experienced an increase in schizoid personality pattern. A randomised control study is also needed to compare the effects of EMDR on schizoid personality pattern with another form of psychological therapy, such as CBT.

The analysis of all the participants in this study revealed an increase in compulsive, histrionic and narcissistic personality pattern on the MCMI-III following EMDR treatment. On the MCMI-III, a clinically significant score on the compulsive, histrionic and narcissistic personality pattern scales are negatively correlated with psychiatric conditions and positively

correlated with measures of mental health and a healthy adaptive personality style, as elevated scores are seen in nonclinical populations such as air force pilots in basic training (Craig, 2008). Future research would need to be conducted to establish whether there is a reliable increase in compulsive, histrionic and narcissistic personality pattern on the MCMI-III following EMDR treatment, which would indicate an increase in psychological health. In addition, a randomised control study also needs to be conducted to compare the effects of EMDR on compulsive, histrionic and narcissistic personality pattern with the effects of another form of psychological therapy such as CBT.

A considerable amount of research is still needed to establish the effect of EMDR treatment on the configuration of personality patterns on the MCMI-III. This research generated 24 different personality patterns. Further investigation of these personality patterns with larger samples would be necessary to establish the effect of EMDR treatment with these configurations. The configurations of personality patterns generated in this study were:

- schizoid, avoidant, depressive, dependent, masochistic and negativistic
- schizoid, avoidant, depressive, dependent and negativistic
- avoidant, depressive, dependent, masochistic and negativistic
- schizoid, avoidant, dependent and masochistic
- avoidant, depressive, dependent and masochistic
- avoidant, depressive, masochistic and negativistic
- depressive, dependent, masochistic and negativistic
- depressive, dependent and masochistic
- depressive, masochistic and negativistic
- avoidant, depressive and masochistic
- avoidant, dependent and negativistic

- avoidant, dependent and masochistic
- avoidant, masochistic and negativistic
- schizoid, depressive and negativistic
- depressive and dependent
- schizoid and negativistic
- dependent and masochistic
- sadistic and narcissistic
- antisocial and negativistic
- schizoid
- dependent
- depressive
- negativistic
- compulsive

With regard to the analysis of the configurations of personality patterns on the MCMI-III in this research study, participants with six clinically significant personality patterns, namely, schizoid, avoidant, depressive, dependent, masochistic and negativistic, tended to have the least reduction in personality patterns following EMDR treatment. The participants who had two to five clinically significant personality patterns on the MCMI-III tended to have variations of; schizoid, avoidant, dependent, masochistic and negativistic, with varying reductions in personality patterns. However, participants with one clinically significant personality pattern on the MCMI-III; depressive, dependent, masochistic, schizoid or negativistic seemed to respond well to EMDR treatment and maintained their gains at the follow-up measurement at the end of the study. This may lead to the conclusion that the fewer clinically significant personality patterns the participant may have on the MCMI-III

before EMDR treatment, the more the reduction in symptoms the participant may experience with EMDR treatment. More research would be needed to verify this conclusion. Also a randomised control study is also needed to ascertain whether the results with EMDR treatment are comparable to other psychological therapies such as CBT, when comparing the effects of EMDR treatment on clinically significant personality pattern.

7.2 Conclusions on effects of EMDR on severe personality patterns

This study also investigated the effects of EMDR on severe personality patterns; schizotypal, borderline and paranoid, as measured on the MCMI-III. An analysis of the results of the severe personality pattern for all the participants revealed that there was a clinically significant reduction in schizotypal, borderline and paranoid severe personality pattern scales on the MCMI-III following the EMDR treatment of one trauma and at the end of the EMDR treatment. These gains were maintained at the follow-up measurement at the end of the study. However, whilst the participants completed the severe personality pattern scales on the MCMI-III, it must be noted that none of the participants had a clinically significant severe personality pattern (>75) on the MCMI-III before EMDR treatment. Therefore the results of this study cannot be generalised to people with clinically significant schizotypal, borderline and paranoid personality pattern.

A number of participants, however, had a score within one standard deviation above the mean (60-74) on the MCMI-III. These results were analysed as it was postulated by the researcher that these results may provide an indicator of how these three severe personality patterns may respond to EMDR treatment.

The results of the analysis of the schizotypal severe personality scale on the MCMI-III revealed 66% of all the participants had a score within one standard deviation above the mean (60-74) before EMDR treatment. The follow-up measurement revealed that the scores on the

schizotypal severe personality pattern on the MCMI-III had reduced from within one standard deviation above the mean (60-74) to below the mean (<60) for 48% of these participants with EMDR treatment. This result needs to be verified to establish whether it can be predicted that 48% of all participants with a score within one standard deviation above the mean (60-74) on the schizotypal severe personality pattern who undergo EMDR treatment will experience a significant reduction in these symptoms. In addition, a randomised control study also needs to be conducted to compare the effects of EMDR on schizotypal severe personality pattern with another form of psychological therapy such as CBT.

The results of the analysis of the borderline severe personality scale on the MCMI-III revealed 59% of all the participants had a score within one standard deviation above the mean (60-74) before EMDR treatment. The follow-up measurement at the end of the study after EMDR treatment revealed that the scores on the borderline severe personality pattern on the MCMI-III had reduced from within one standard deviation above the mean (60-74) to below the mean (<60) for 84% of these participants with EMDR treatment. This is a considerable amount of participants who experienced a reduction in borderline severe personality pattern and more research is needed to establish whether it can be predicted that 84% of all participants with a score within one standard deviation above the mean (60-74) on the borderline severe personality pattern who undergo EMDR treatment will experience a significant reduction in these symptoms. In addition, more research is needed to establish whether people with clinically significant borderline personality pattern before EMDR treatment will experience a similar reduction in symptoms compared to people with a less severe borderline personality pattern. Also a randomised control study needs to be conducted to compare the effects of EMDR on borderline severe personality pattern with another form of psychological therapy such as dialectical behaviour therapy (DBT).

The results of the analysis of the paranoid severe personality scale on the MCMI-III revealed 72% of all the participants had a score within one standard deviation above the mean (60-74) before EMDR treatment. The follow-up measurement at the end of the study revealed that the scores on the paranoid severe personality pattern on the MCMI-III had reduced from within one standard deviation above the mean (60-74) to below the mean (<60) for 68% of these participants with EMDR treatment. This result needs to be verified to establish whether it can be predicted that 68% of all participants with a score within one standard deviation above the mean (60-74) on the paranoid severe personality pattern who undergo EMDR treatment will experience a significant reduction in these symptoms. In addition, more research is needed to establish whether people with clinically significant paranoid personality pattern before EMDR treatment will experience a similar reduction in symptoms compared to people with a less severe paranoid personality pattern. Also a randomised control study needs to be conducted to compare the effects of EMDR on paranoid severe personality pattern with another form of psychological therapy such as CBT.

7.3 Conclusions on effects of EMDR on depressive constructs

The aim of this study was to investigate the effects of EMDR treatment on different kinds of depressive constructs, major depression, dysthymia and depressive personality as measured on the MCMI-III. In previous research, the effects of EMDR treatment with depressive symptoms were investigated as a secondary measure to post traumatic stress, and the BDI was used as a measure of depression.

The analysis of this study revealed that people with clinically significant major depression on the MCMI-III (>75) before EMDR treatment experienced the greatest reduction in symptoms with EMDR treatment. Of the participants who had clinically significant major depression before EMDR treatment, 86% no longer reported clinically significant scores on

the MCMI-III (>75) at the follow-up measurement at the end of the study. Further research is needed to verify this result and establish whether it can be predicted that 86% of all participants with clinically significant major depression before EMDR treatment will experience a significant reduction in major depression following EMDR treatment. In addition, a randomised control study needs to be conducted to compare the effects of EMDR on major depression with another form of psychological therapy such as CBT. To make this study as effective as possible, all the participants would need to have clinically significant major depression before EMDR treatment.

The analysis of this study revealed that people with clinically significant dysthymia on the MCMI-III (>75) experienced the second largest reduction in depressive symptoms with EMDR treatment. Of the participants who had clinically significant dysthymia before EMDR treatment, 58% no longer reported clinically significant scores on the MCMI-III (>75) at the follow-up measurement at the end of the study. Further research is needed to verify this result and establish whether it can be predicted that 58% of all participants with clinically significant dysthymia before EMDR treatment will experience a significant reduction in dysthymia. A randomised control study also needs to be conducted to compare the effects of EMDR on dysthymia with another form of psychological therapy such as CBT, and all the participants would need to have clinically significant dysthymia before EMDR treatment to make the study as effective as possible.

The analysis of this study revealed that people with clinically significant depressive personality pattern on the MCMI-III (>75) before EMDR treatment experienced the lowest reduction in depressive symptoms with EMDR treatment. Of the participants who had clinically significant depressive personality pattern before EMDR treatment, 33% no longer reported clinically significant scores on the MCMI-III (>75) at the follow-up measurement at the end of the study. Whilst there was a significant decrease at the measurement after the

treatment of one trauma and at the end of EMDR treatment, the gains were not well maintained at the follow-up measurement by a number of participants. Further research is needed to establish whether it can be predicted that 33% of all participants with clinically significant depressive personality pattern before EMDR treatment will experience a significant reduction in depressive personality pattern. Furthermore research is needed to establish whether the gains on depressive personality pattern are not well maintained after EMDR treatment. A randomised control study also needs to be conducted to compare the effects of EMDR on depressive personality with another form of psychological therapy such as CBT. In addition, all the participants would need to have clinically significant depressive personality pattern before EMDR treatment to make the study as effective as possible.

The results of the analysis in this study revealed that EMDR treatment is much more effective in reducing symptoms of major depression compared to the other forms of depression on the MCMI-III because 86% of the participants with major depression before EMDR treatment no longer had clinically significant major depression at the end of the study compared to 59% of participants who had clinically significant dysthymia and 33% of participants who had depressive personality pattern before EMDR treatment. Future research is needed to establish whether EMDR treatment is more effective in reducing symptoms of major depression compared to dysthymia and depressive personality.

7.4 Conclusions on effects of EMDR on other clinical syndromes

One of the aims of this study was to investigate the effects of EMDR treatment on two other clinical syndromes, post traumatic stress and anxiety, as measured on the MCMI-III, and compare it to the results of the current research. To date there have been a number of randomised control studies into the effect of EMDR on post traumatic stress and it has been established by NICE that EMDR is an excellent form of treatment for post traumatic stress.

In addition, the effectiveness of EMDR in reducing symptoms of anxiety has also been a secondary measure on these studies in post traumatic stress.

The analysis of the results of this study revealed that EMDR treatment is very effective in reducing the symptoms of post traumatic stress, as 91% of the participants who had clinically significant post traumatic stress before EMDR treatment, no longer had clinically significant post traumatic stress at the follow-up measurement at the end of the study. This result is highly consistent with the findings of other randomised control studies which investigated the effects of EMDR on post traumatic stress and reported a significant reduction in symptoms of post traumatic stress with EMDR treatment (Renfrey and Spates, 1994; Vaughan et al, 1994; Wilson et al., 1995, 1997; Ironson et al., 1995, 1997; Rothbaum, 1997; Carlson et al, 1998; Lee et al, 2002; Rothbaum et al., 2005; Marcus, et al, 1997, 2004; Van der Kolk et al. 2007). Because it has been established that EMDR treatment is effective in reducing post traumatic stress, there is no longer a strong need for randomised control studies on post traumatic stress. Instead the focus is more on the effectiveness of EMDR treatment in reducing depressive symptoms, other clinical syndromes and personality patterns.

All the participants in this study had clinically significant anxiety before EMDR treatment. After the treatment of one trauma with EMDR, 50% percent of the participants no longer had clinically significant anxiety. At the end of EMDR treatment, 75% of the participants no longer had clinically significant anxiety and these results were maintained by 69% of the participants at the follow-up measurement at the end of the study. The results obtained in this study are highly consistent with the findings of other randomised control studies that reported a significant reduction in symptoms of anxiety with EMDR treatment (Marcus et al., 1997, 2004; Scheck et al., 1998; Edmond et al., 1999; Rothbaum et al., 2005). Randomised control studies are needed in which all the participants have clinically significant

anxiety before EMDR treatment to establish whether EMDR treatment can significantly reduce the symptoms of anxiety compared to other therapies such as CBT.

7.5 Conclusions on effects of EMDR on severe clinical syndromes

This study investigated the effects of EMDR on the three severe clinical syndromes, bipolar (manic), thought disorder and delusional disorder, and two dependence syndromes, namely, alcohol and drug dependence, on the MCMI-III. While the participants completed these scales on the MCMI-III, it must however be noted that none of the participants had a clinically significant severe clinical syndrome or dependence syndrome (>75) on the MCMI-III before EMDR treatment, as a clinically significant score on these scales were part of the exclusion criteria. Therefore the results of this study cannot be generalised to people who have clinically significant bipolar, thought disorder and delusional disorder, or to people who have clinically significant alcohol and drug dependence. However, a number of participants had a score within one standard deviation above the mean (60-74) on the MCMI-III in this study. These results were considered as they may provide an indicator of how the severe clinical syndromes and the dependence syndromes may respond to EMDR treatment. More research would be needed in the future to establish whether EMDR is effective in treating people with a clinically significant severe clinical syndromes and dependence disorders.

The results of the analysis of the bipolar (manic) scale on the MCMI-III revealed 59% of all the participants had a score within one standard deviation above the mean (60-74) before EMDR treatment. The follow-up measurement at the end of the study revealed that the scores on the bipolar (manic) scale on the MCMI-III had reduced from within one standard deviation above the mean (60-74) to below the mean (<60) for 53% of these participants with EMDR treatment. This result needs to be verified to establish whether it can be predicted that 53% of all participants with a score within one standard deviation above the mean (60-74) on

the bipolar (manic) scale who undergo EMDR treatment will experience a reduction in these symptoms. Bipolar is a complex condition that is treated with a combination of psychotropic medication and psychotherapy, such as cognitive behaviour therapy. Randomised control studies with vigorous designs could be conducted to establish in what ways EMDR treatment may be effective in treating people with clinically significant bipolar disorder compared to other forms of treatment.

The results of the analysis of the thought disorder scale on the MCMI-III revealed 84% of all the participants had a score within one standard deviation above the mean (60-74) before EMDR treatment. The follow-up measurement at the end of the study revealed that the scores on the thought disorder scale on the MCMI-III had reduced from within one standard deviation above the mean (60-74) to below the mean (<60) for 63% of these participants with EMDR treatment. This result needs to be verified to establish whether it can be predicted that 63% of all participants with a score within one standard deviation above the mean (60-74) on the thought disorder scale on the MCMI-III who undergo EMDR treatment will experience a reduction in these symptoms. More studies are also needed to establish the effect of EMDR treatment with people who have a clinically significant thought disorder. In addition, randomised control studies are also needed to compare the effects of EMDR treatment with thought disorder with other forms of psychological therapies.

The results of the analysis of the delusional disorder scale on the MCMI-III revealed 28% of all the participants had a score within one standard deviation above the mean (60-74) before EMDR treatment. The follow-up measurement at the end of the study revealed that the scores on the delusional disorder scale on the MCMI-III had reduced from within one standard deviation above the mean (60-74) to below the mean (<60) for 67% of these participants with EMDR treatment. This result needs to be verified to establish whether it can be predicted that 67% of all participants with a score within one standard deviation above the

mean (60-74) on the delusional disorder scale on the MCMI-III who undergo EMDR treatment will experience a reduction in these symptoms. More studies are needed to establish the effect of EMDR with people who have a clinically significant delusional disorder. In addition, randomised control studies are also needed to compare the effects of EMDR on delusional disorder with another form of psychological therapy such as CBT.

The results of the analysis of the alcohol dependence scale on the MCMI-III revealed 78% of all the participants had a score within one standard deviation above the mean (60-74) before EMDR treatment. The follow-up measurement at the end of the study revealed that the scores on the alcohol dependence scale on the MCMI-III had reduced from within one standard deviation above the mean (60-74) to below the mean (<60) for 48% of these participants with EMDR treatment. This result needs to be verified to establish whether it can be predicted that 48% of all participants with a score within one standard deviation above the mean (60-74) on the alcohol dependence scale on the MCMI-III who undergo EMDR treatment will experience a reduction in their dependence symptoms. More studies are also needed to establish the effect of EMDR with people who have clinically significant alcohol dependence. Alcohol dependence is a complex condition, and randomised control studies with vigorous designs need to be conducted to compare the effects of EMDR on alcohol dependence with other interventions, such as a 12-step program.

The results of the analysis of the drug dependence scale on the MCMI-III revealed 44% of all the participants had a score within one standard deviation above the mean (60-74) before EMDR treatment. The follow-up measurement at the end of the study revealed that the scores on the drug dependence scale on the MCMI-III had reduced from within one standard deviation above the mean (60-74) to below the mean (<60) for 57% of these participants with EMDR treatment. This result needs to be verified to establish whether it can be predicted that 57% of all participants with a score within one standard deviation above the mean (60-74) on

the drug dependence scale on the MCMI-III who undergo EMDR treatment will experience a reduction in drug dependence. More studies are also needed to establish the effect of EMDR treatment with people who have clinically significant drug dependence. Drug dependence is a complex condition that is treated both with medication and therapy. Vigorous randomised control studies are needed to compare the effects of EMDR treatment on drug dependence with other interventions, and in what ways is EMDR treatment effective.

7.6 Conclusions on effects of EMDR on dissociation

One of the aims of this study was to investigate the effects of EMDR on dissociation, as measured by the Dissociative Experience Scale II (DES-II). The paired t-test for significant change suggested that there was a significant decrease in dissociation for all the participants who underwent EMDR treatment, after the treatment of one trauma, at the end of EMDR treatment, and at the follow-up measurement at the end of the research study. In addition, the paired t-test for significant change suggested that there was no significant change in dissociation for all the participants between the measurement at the end of EMDR treatment and the follow-up measurement at the end of the research study, which means that gains achieved were maintained.

The results of the findings of this research study are consistent with the findings of other studies that analysed the reduction in dissociation as a secondary measure in studies investigating the effects of EMDR treatment on post traumatic stress (Rothbaum, 1997; Taylor et al., 2003; Rothbaum et al., 2005). However, even though other studies have reported a significant reduction in dissociation with EMDR treatment, EMDR has not been established as a recommended treatment for the reduction of dissociative symptoms by NICE. Therefore, more randomised control studies are needed in which the effects of EMDR treatment can be compared with other psychological therapies.

7.7 Conclusions on number of EMDR sessions versus type of trauma

This research study established that certain types of trauma require a different mean number of EMDR treatment sessions to reduce the subjective unit of disturbance to zero per trauma (See Table 51). However, the sample size of this research study was too small to generalise these findings to a clinical population. Therefore, future studies could be conducted to establish whether certain types of trauma, have specific mean number of treatment sessions.

Table 51. Type of trauma versus mean number of treatment sessions

Type of Trauma	Mean number of EMDR treatment sessions
Adult physical assault	4.75 sessions
Domestic abuse	6.6 sessions
Childhood sexual assault	7.0 sessions
Childhood sexual abuse (fondling)	5.5 sessions
Childhood bullying	6.5 sessions
Bullying in adulthood	3.3 sessions
Burn victim	6.0 sessions
Road traffic accidents (involved)	9.0 sessions
Witnessed fatal road traffic accidents	11.5 sessions
Death of a relative	7.5 sessions
Traumatic birth	8.75 sessions
Termination of pregnancy	3.5 sessions
Relationship difficulties	6.4 sessions

7.8 Future benefits from this study

In order for this research study to be conducted, the South Gloucestershire NHS kindly established the NHS Post Traumatic Stress Clinic. All the people referred to this clinic by their GPs, became part of this research study. At the end of this research project, the manager of the South Gloucestershire Primary Care Mental Health Service motivated for the clinic to continue. Therefore the NHS Post Traumatic Stress Clinic became a permanent feature and the clinic began to function as a fully funded NHS clinic at the end of this study. The researcher was made the head of the clinic and is now paid for her services. A coordinator for the clinic has also been employed who attends to all the administration of the clinic and management of the waiting lists. Another EMDR clinician has also joined the PTSD Clinic to undertake EMDR treatment, which has helped shorten the waiting list for this service. The clinic has also opened up placements for doctoral counselling psychology students at the University of the West of England, and to date two doctoral students have worked in placements at the PTSD Clinic. In June 2009, the clinic also became a CBT clinic through the government IAPT programme (Improved Access to Psychological Therapies). So the PTSD Clinic now offers both EMDR and CBT treatment for the treatment of psychological trauma.

The PTSD clinic now operates as a clinical and research facility. After this research project, new research projects started within the resources that the clinic was able to provide. One research project stems from the number of people who presented with both complex trauma and psychotic symptoms on the MCMI-III. Permission has been obtained to undertake a case study which will investigate the effects of EMDR treatment on a person with clinically significant schizotypal and paranoid personality pattern, and clinically significant thought disorder, post traumatic stress and anxiety, following a severe assault. This will be the first treatment programme designed to reduce clinically significant psychotic symptoms

with EMDR treatment at the PTSD clinic. Another research project that will be undertaken will be how effective EMDR treatment is compared to the IAPT CBT treatment.

Another benefit from this study is that the findings of this research will be written up and will be submitted to the Journal of EMDR Research and Practice for publication. This study will not only offer new findings with regards to the effects of EMDR treatment on clinical personality patterns, severe personality patterns, depressive constructs, other clinical syndromes and severe clinical syndromes, but will stimulate new research to establish whether the results of this study can be verified or rejected.

7.9 Final summary

The aim of this study was to investigate the effects of EMDR treatment on a wide range of clinical conditions. This study investigated the patterns of reduction of distress in clinical personality patterns, severe personality patterns, depressive constructs, other clinical syndromes and severe clinical syndromes as measured by the MCMI-III following EMDR treatment. The study also investigated the effects of EMDR treatment on dissociation as measured by the DES-II. Thirty-two people, ranging from 23 to 65 years old, underwent the full EMDR protocol treatment for up to three traumas.

The results of the analysis of clinical personality patterns on the MCMI-III revealed that EMDR is most effective in reducing the symptoms of dependent personality pattern. After the EMDR treatment of one trauma, 53% of participants with clinically significant dependent personality pattern before EMDR treatment no longer had a clinically significant score (>75) on the MCMI-III; compared to 56% with masochistic personality pattern, 54% with negativistic personality pattern, 54% with avoidant personality pattern, 33% with depressive personality pattern and 42% with schizoid personality pattern. At the end of EMDR treatment 76% of participants with clinically significant dependent personality pattern

before EMDR treatment no longer had a clinically significant score (>75) on the MCMI-III; compared to 75% with masochistic personality pattern, 77% with negativistic personality pattern, 69% with avoidant personality pattern, 40% with depressive personality pattern and 29% with schizoid personality pattern. These gains were maintained on the MCMI-III at follow-up by 76% with dependent personality pattern, 64% with masochistic personality pattern, 46% with negativistic personality pattern, 38% with avoidant personality pattern, 33% with depressive personality pattern and 29% with schizoid personality pattern.

The analysis of clinical personality patterns also revealed that there was a significant increase in scores on the compulsive, histrionic and narcissistic personality pattern on the MCMI-III between the measurement before EMDR treatment and the measurement at the end of the EMDR treatment. In addition, the analysis revealed that whilst there was a significant increase in histrionic and narcissistic personality pattern on the MCMI-III between the measurement before EMDR treatment and the follow-up measurement at the end of the study, the increase in compulsive personality pattern was not significant at the .01 level but tended towards significance (i.e., $p < .05$). On the MCMI-III, elevated scores on the compulsive, histrionic and narcissistic personality pattern scales are negatively correlated with psychiatric conditions and positive correlated with measures of mental health and a healthy adaptive personality style, as elevated scores are seen in training air force pilots (Craig, 2008).

The analysis of the severe personality patterns after the EMDR treatment of one trauma revealed that the scores on the MCMI-III reduced from within one standard deviation above the mean (60-74) to below the mean (<60) for 79% of participants with borderline personality pattern, compared to 52% with paranoid personality pattern and 38% with schizotypal personality pattern. At the end of the EMDR treatment, the scores on the MCMI-III reduced from within one standard deviation above the mean (60-74) to below the mean (<60) for 84% of participants with borderline personality pattern, compared to 68% with

paranoid personality pattern and 52% with schizotypal personality pattern. These gains were maintained on the MCMI-III at follow-up by 84% with borderline personality pattern, 68% with paranoid personality pattern and 48% with schizotypal personality pattern.

The analysis of the depressive constructs revealed that EMDR is effective in reducing symptoms of major depression. After the EMDR treatment of one trauma, 92% of participants with clinically significant major depression before EMDR treatment no longer had a clinically significant score (>75) on the MCMI-III; compared to 47% with dysthymia and 33% with depressive personality pattern. At the end of EMDR treatment, 86% of participants with clinically significant major depression before EMDR treatment no longer had a clinically significant score (>75) on the MCMI-III; compared to 73% with dysthymia and 40% with depressive personality pattern. These gains were maintained on the MCMI-III at follow-up by 86% with major depression, 58% with dysthymia, and 33% with depressive personality pattern.

The findings regarding the other clinical syndromes revealed that 82% of participants with clinically significant post traumatic stress before EMDR treatment, no longer had a clinically significant score (>75) on the MCMI-III after the treatment of one trauma, compared to 50% of participants with anxiety. At the end of EMDR treatment, 91% of participants with clinically significant post traumatic stress before EMDR treatment, no longer had a clinically significant score (>75) on the MCMI-III, compared to 75% of participants with anxiety. These gains were maintained on the MCMI-III at follow-up by 91% of participants with post traumatic stress, compared to 69% of participants with anxiety.

The analysis of the severe clinical syndromes after the EMDR treatment of one trauma revealed that the scores on the MCMI-III reduced from within one standard deviation above the mean (60-74) to below the mean (<60) for 89% of participants with delusional disorder, compared to 59% with thought disorder, 53% with bipolar (manic), 48% with alcohol

dependence and 36% with drug dependence. At the end of EMDR treatment the scores on the MCMI-III reduced from within one standard deviation above the mean (60-74) to below the mean (<60) for 78% of participants with delusional disorder, compared to 67% with thought disorder, 32% with bipolar (manic), 28% with alcohol dependence and 28% with drug dependence. These gains were maintained on the MCMI-III at follow-up by 67% of participants with delusional disorder, compared to 63% with thought disorder, 53% with bipolar (manic), 48% with alcohol dependence and 57% with drug dependence.

The analysis of the effects of EMDR on dissociation revealed that there was a significant decrease in symptoms of dissociation on the DES-II after the EMDR treatment of one trauma, at the end of EMDR treatment and these gains were maintained at the follow-up measurement at the end of the study.

This study provided an extensive analysis of the effects of EMDR treatment on different clinical conditions, including clinical personality patterns, severe personality patterns, depressive constructs, other clinical syndromes, severe clinical syndromes and dissociation. The findings of this study suggest that EMDR is successful in the treatment of a number of clinical conditions in addition to post traumatic stress, especially major depression and dependent personality pattern. Further research is strongly indicated in order to further explicate the efficacy of EMDR across different clinical conditions.

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Appendix 1

- 1.1 Documentation approved by the Southmead Ethics Committee
 - 1.1.1 Patient information sheet
 - 1.1.2 Flow Chart outlining treatment process
 - 1.1.3 Consent form
- 1.2 Letter to GPs outlining study and inviting referral of participants.

Appendix 2

- 2.1 MCMI-III - Length, internal consistency, and test-retest reliability of scales
- 2.2 Correlations between MCMI-III base rate scores, and BDI and STAI scores

Appendix 3

- 3.1 Type of trauma treated for each participant
- 3.2 Number of sessions of EMDR treatment per trauma for each participant

APPENDIX 1.1.1
DOCUMENTATION APPROVED BY ETHICS COMMITTEE

PARTICIPANT INFORMATION SHEET
EYE MOVEMENT DESENSITISATION AND REPROCESSING RESEARCH

1. Study title.

A study investigating how a person's psychological well-being improves after distressing experiences are treated using Eye Movement Desensitisation and Reprocessing (EMDR) and whether individual characteristics may influence this process.

2. What is the purpose of this study?

We want to see how the treatment of distressing experiences with Eye Movement Desensitisation and Reprocessing (EMDR) improves your overall psychological well-being. We will take into consideration the number of distressing experiences you have had in the past, and how such things as you age, gender or education affect the way distressing experiences are processed. This information will help us establish how much EMDR therapy different people need to improve their overall psychological well-being.

3. Why have you been chosen?

You are over the age of 18 years and have symptoms of posttraumatic stress, anxiety, depression, or a variety of physical complaints. Symptoms of posttraumatic stress may include flashbacks or nightmares of the traumatic events, symptoms of anxiety may include worrying considerably and symptoms of depression may include feeling down, sad or losing interest in things previously enjoyed.

4. What is EMDR and what will happen if I take part?

Eye Movement Desensitisation and Reprocessing (EMDR) is a psychological therapy that uses eye movements. We generally process daily information without being aware of it, particularly during the rapid eye movements (REM) period when we sleep. However, people may have difficulties when something out of the ordinary overwhelms the natural coping abilities. Memories may not be processed as usual and become frozen in time because the brain is overwhelmed. Later, if something reminds us of the distressing event, we may feel fear, anxiety, despair and anger, even if we forget the event itself. EMDR tends to unlock the frozen memories and reprocess them with eye movements so that these memories lose their painful intensity.

EMDR therapy has a number of phases and is mapped out on the attached flow chart. In the first phase you will meet the researcher, Brigitte Bodill, who will explain the project to you. You will be able to ask any questions. Should you wish to participate you would sign a consent form. Then an assessment is completed, which will include an interview and two questionnaires. One questionnaire is called the Millon Clinical Multiaxial Inventory-III (MCMI-III) and provides details of the kinds of psychological distress you are experiencing. The other questionnaire is called the Dissociative Experience Scale II (DES-II) and provides information of how you cope with past traumatic events while still being able to engage in daily activities. The next phase is to learn a variety of relaxation exercises, which can be used between sessions to reduce distress. After this, your distressing experiences will be identified along with the feelings and the body sensations you experienced. We will then focus on these distressing experiences and do eye movements, similar to REM sleep, which are recreated by watching the researcher moving her finger, or a light, back and forth across your visual field. The eye movements will last a short while, after which you can report back on what you experienced: your thoughts, feelings and body sensations. The eye movements make use of natural healing abilities, and distressing memories tend to lose their painful intensity, becoming neutral memories of the past. After each distressing experience is reprocessed, your distress will be measured again with the two questionnaires, MCMI-III and DES-II, to see how your overall well-being has improved. The number of sessions you need will depend on the kind of distress you are experiencing and its severity. Each person is different so you will need to go at your own pace.

5. What are the benefits of taking part?

EMDR is designed to reduce distress associated with painful memories, and with time the distress of painful memories generally decreases, which generally leads to improved emotional health.

6. Are there any disadvantages in taking part in this study?

In this study, past distressing experiences will be reprocessed using EMDR therapy, during which a person can experience strong feelings and thoughts for a short time. Therefore, you need to be willing

to tolerate these strong feelings until the distress reduces. To start with, you may also feel more emotional for a day or two after the EMDR sessions as these distressing memories come to mind. However, with time the distress generally decreases.

7. What if something goes wrong?

If you find that during the therapy you experience feelings and thoughts that seem too difficult to tolerate, then you should inform the researcher immediately and together you can decide perhaps to work on memories that are less painful for a while. Also bear in mind that participation is voluntary and you can leave the study at any time. Should you experience difficulties you are also able to contact the primary mental health manager, Iain Davidson.

8. Are there any restrictions on what I may eat or do?

There are no restrictions on what you may eat during the research. After some EMDR sessions you may feel more emotional, especially if you are experiencing flashbacks, and we do not recommend that you engage in anything too demanding right after the session, such as writing an exam or going for a job interview. However, during the course of the therapy it is likely that your distress will decrease.

9. What happens with the information collected about me?

The information collected from the Millon Clinical Multiaxial Inventory-III questionnaire and Dissociative Experience Scale will be analysed using a computer program called SPSS (Statistical Program for Social Sciences) to measure any changes that occurred during the therapy. The academic supervisor will check these results. The researcher will process the data on a computer that is password protected and locked in an office. The researcher, Brigitte Bodill, and the primary mental health manager of South Gloucestershire Primary Care Trust, Iain Davidson, will have access to the data generated by the study and will act as custodians for this data.

10. What will happen with the results of the study?

If you wish to be informed about the results of the study, you will need to tell the researcher who will ensure that a summary of the research is sent to you.

11. Confidentiality – who will know I am taking part in the study?

- Your GP will refer you to the study and will receive a copy of your consent form.
- The questionnaires you complete will not have your name on, but an anonymous code instead. This code will also be used on your computerised records, so no one will know the questionnaire belongs to you. When not in use, the researcher will keep your questionnaires and treatment information in a locked filing cabinet.
- The therapy sessions are also confidential. However, if the researcher believes you are at significant risk of harm to yourself or others, including terrorism and any contravention of the Children's Act, the confidentiality will need to be broken as this may need to be referred to other agencies.

12. Is my doctor being paid for including me in the study?

No

13. Who is organising the study?

This is a joint study undertaken by the South Gloucestershire Primary Care Trust, England and the University of KwaZulu Natal (previously Natal) in South Africa. The study will last for approximately 2 years, although your part of the study will end once your distress is considerably reduced.

14. Local Research Ethic Committee Approval

This study was approved by the Southmead Research Ethics Committee.

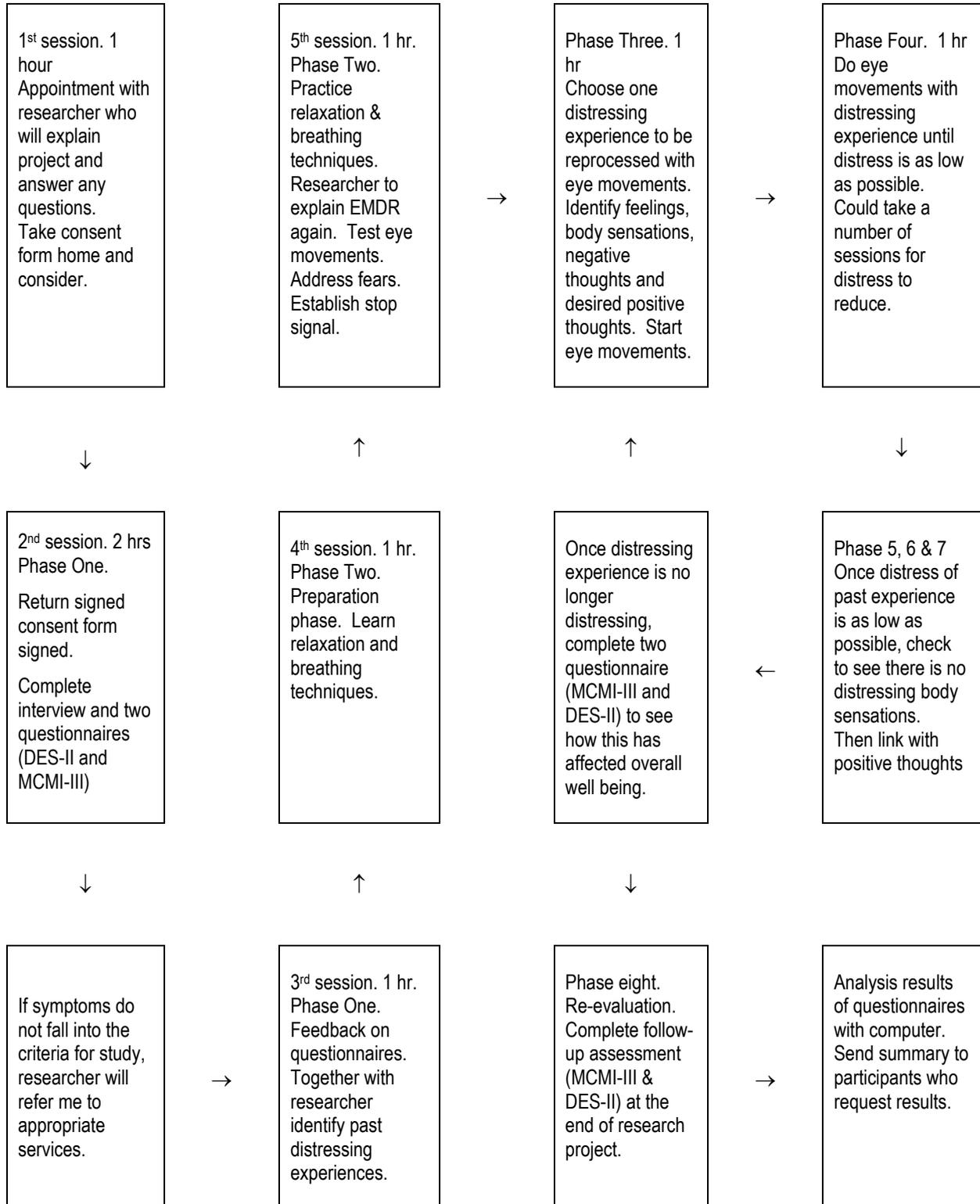
15. Contact for further information

If you wish to have further information on the study, please contact the researcher Brigitte Bodill on telephone number 01454 619370. If you wish to discuss this matter with someone else besides the researcher, please contact the primary mental health manager, Iain Davidson on telephone number 01179 708961.

Thank you, in advance for taking part in this study. 19 April 2005

**APPENDIX 1.1.2
DOCUMENTATION APPROVED BY ETHICS COMMITTEE**

**FLOW CHART FOR PARTICIPANTS OUTLINING
PHASES OF EYE MOVEMENT DESENSITIZATION AND REPROCESSING RESEARCH**



Flow chart for participants, EMDR research

Date: 21 March 2005, Version 2

**APPENDIX 1.1.3
DOCUMENTATION APPROVED BY ETHICS COMMITTEE**

Centre Number:

Study Number: 05/Q2002/13

Patient Information Number for this trial:

CONSENT FORM

Title of Project:

A study investigating the pattern of reduction of distress in clinical syndromes using eye movement desensitization and reprocessing (EMDR).

Name of Researcher:

Brigitte Bodill

Name and number of independent person:

Iain Davidson, Primary Care Mental Health Manager

Tel: 0117 970 8961

Please initial box

1. I confirm that I have read and understand the information sheet dated 21 March 2005 for the above study.
2. I understand that my participation is voluntary and that I am free to withdraw at any time without my medical care or legal rights being affected.
3. I am willing to allow access to my medical records but understand that strict confidentiality will be maintained.
4. I agree to take part in the above study.

Name of participant

Date

Signature

Principal Researcher

Date

Signature

1 for participant; 1 for researcher; 1 for general practitioner

APPENDIX 1.2

South Gloucestershire

Primary Care Trust

Monarch Court
Emerald Park
Emerson's Green
South Gloucestershire
BS16 7FH

Telephone: 0117 330 2400

Fax: 0117 330 2401

21 March 2005

Dear General Practitioner,

The South Gloucestershire Primary Care Trust is currently supporting a PhD research by Brigitte Bodill. The research is studying the pattern of reduction of distress in posttraumatic stress, somatoform disorders, depression and anxiety disorders, using Eye Movement Desensitisation and Reprocessing (EMDR). Scientific research now sees EMDR as efficacious as cognitive behavioural therapy (CBT) in the treatment of psychological distress.

Should you have patients with the symptoms listed below and you feel that they may benefit from the treatment, you are welcome to make them aware of the study and refer them should they be willing to participate. Patients should undergo a medical examine to ensure that the symptoms they present are not due to any known medical condition.

a) *Posttraumatic stress*. Symptoms generally include experiencing or witnessing a life-threatening event and experiencing fear, horror and helplessness. Traumatic events include natural disasters, such as tsunami and fires etc. Man-made disasters include car, train or industrial accidents, rape, physical assault, childhood abuse and neglect etc. A traumatised person may experience flashbacks, re-experiencing images, sensations or thoughts that occurred during the event. May experience nightmares, sleep difficulties, irritability, avoid anything that reminds them of the trauma and find it hard to plan for the future.

b) *Somatoform disorder*. May have multiple somatic and physical complaints, which cannot be fully explained by any known medical condition, resulting in occupational and social impairment. Symptoms include history of pain at least four different sites (eg head, abdomen, back, joints, chest, rectum, extremities) or function (urination, menstruation, intercourse), two gastrointestinal symptoms (eg diarrhoea, bloating, nausea, vomiting, food intolerance), one sexual symptom (eg irregular menses or excessive bleeding, sexual indifference, erectile or ejaculatory dysfunction) and one pseudoneurological symptom (eg impaired coordination and balance, loss of touch or pain sensations, difficulty swallowing, lump in throat, paralysis or localized weakness, double vision, blindness, deafness, urinary retention or lost their voice).

c) *Depression*. Symptoms generally include a loss of interest in life or pleasurable activities, with a depressed, sad mood and possible feelings of hopelessness, worthlessness, guilt and inferiority. May feel frustrated and irritable, and have difficulties concentrating and making decisions. There may be changes in appetite, difficulties sleeping and feelings of fatigue even after rest.

d) *Anxiety disorders.* May have generalized anxiety, tending to worry a lot of the time about misfortunes to family, occupation, finances or performance. May have difficulty falling asleep, easily fatigued, irritable and restless. May have travel phobias after a vehicle accident.

The study is unable to accommodate people who have active suicidal or homicidal intent and ongoing self-mutilation. These may be referred to secondary care. The research is also unable to accommodate people with extreme alcohol and drug dependence (including benzodiazepines) as the project does not have the necessary resources to support these conditions. The study is also not suitable for people with severe personality pattern, such as schizotypal, borderline and paranoid personality patterns; severe clinical syndromes, including delusional and thought disorders; and severe major depression and dissociative disorders. These should also be referred to secondary care. The project would also not be suitable for those of extreme age and physical frailty, or who have severe medical conditions such as heart conditions, uncontrolled epilepsy and terminal illness. Women who are heavily pregnant may join the study after the birth.

Participants will be provided with a full explanation of EMDR, what the study will entail and an opportunity to ask any questions. The participant needs to be aware that the therapy entails working with distressing experiences and the associated feelings and thoughts. Should they wish to participate, they will need to sign consent form to undergo a clinical interview, a Millon Clinical Multiaxial Inventory-III clinical inventory (to establish extent and nature of clinical syndrome), a DES-II scale (to ascertain degrees of dissociation) and EMDR treatment.

EMDR treatment will consist of a number of phases. In the first phase the research will take a full history, assess the participant's readiness for EMDR and identify possible distressing events for EMDR processing. The second phase of treatment is to ensure that the participant has adequate coping skills and methods of handling emotional distress. The therapy will provide participant with relaxation techniques, deep breathing exercises, pleasant imagery and positive resource installation. Participants will be able to use these between sessions. The next phase of therapy includes identifying the most distressing memory the participant would like to reprocess, and the associated emotions, physical sensations and negative beliefs. Participants are also asked to select the positive beliefs they would like to think about themselves at the end of the reprocessing. The participants will then focus on the distress memory and associated cognitive and sensation, while engaging in bilateral brain stimulation (eye movements). The process is continued until there is no psychological distress associated with the distressing memory.

The study plans to look at the processes during the reduction of the distress, including the relationship between subjective and objective measures of distress. The advantage of the study to the participant is that there is no set time limit for the reduction of distress. The study plans to let the reduction of distress run its natural course to be able to study the processes fully. This could mean that each participant may have a number of EMDR sessions.

Should you wish to invite any of your patients to participate in the above study, please forward their details to me, namely their name, address and telephone number. I will send them an invitation and information about the study.

Thank you for your attention to the above and we look forward to providing this opportunity for your patients.

Yours sincerely

Iain Davidson
Primary Mental Health Manager

APPENDIX 2.1

Table 52. MCMI-III - Length, internal consistency, and test-retest reliability of scales

	Number of items	Internal Consistency ^a (Cronbach's Alpha)	Test-Retest ^b Reliability
Clinical Personality Patterns			
1 Schizoid	16	.81	.89
2A Avoidant	16	.89	.89
2B Depressive	15	.89	.93
3 Dependent	16	.85	.89
4 Histrionic	17	.81	.91
5 Narcissistic	24	.67	.89
6A Antisocial	17	.77	.93
6B Sadistic (Aggressive)	20	.79	.88
7 Compulsive	17	.66	.92
8A Negativistic (Passive-Aggressive)	16	.83	.89
8B Masochistic (Self Defeating)	15	.87	.91
Severe Personality Patterns			
S Schizotypal	16	.85	.87
C Borderline	16	.85	.93
P Paranoid	17	.84	.85
Clinical Syndromes			
A Anxiety	14	.86	.84
H Somatoform	12	.86	.96
N Bipolar: Manic	13	.71	.93
D Dysthymia	14	.88	.91
B Alcohol Dependence	15	.82	.92
T Drug Dependence	14	.83	.91
R Post Traumatic Stress Disorder	16	.89	.94
Severe Clinical Syndromes			
SS Thought Disorder	17	.87	.92
CC Major Depression	17	.90	.95
PP Delusional Disorder	13	.79	.86
Modifying Indices			
X Disclosure	NA	NA	.94
Y Desirability	21	.86	.92
Z Debasement	33	.95	.82

^aCross-validation sample ($N = 398$)

^bTest-retest interval = 5 - 14 days ($n = 87$)

Millon, et al (1997)

APPENDIX 2.2

Table 53. Correlations between MCMI-III base rate scores, and BDI and STAI scores

MCMI-III		Beck Depression Inventory	State-Trait Anxiety Inventory	
Scale			State Anxiety	Trait Anxiety
1	Schizoid	.53**	.45**	.48**
2A	Avoidant	.45**	.52**	.59**
2B	Depressive	.56**	.53**	.62**
3	Dependent	.50**	.42**	.48**
4	Histrionic	-.49**	-.40**	-.54**
5	Narcissistic	-.40**	-.27*	-.44**
6A	Antisocial	.20*	.23	.26*
6B	Sadistic	.22**	.20	.24
7	Compulsive	-.30**	-.27*	-.42**
8A	Negativistic	.43**	.44**	.55**
8B	Masochistic	.53**	.44**	.59**
S	Schizotypal	.51**	.48**	.55**
C	Borderline	.56**	.49**	.59**
P	Paranoid	.42**	.42**	.40**
A	Anxiety	.61**	.55**	.58**
H	Somatoform	.63**	.54**	.52**
N	Bipolar: Manic	.24**	.25*	.27*
D	Dysthymia	.71**	.60**	.68**
B	Alcohol Dependence	.36**	.25*	.22
T	Drug Dependence	.18*	.11	.17
R	Post Traumatic Stress	.63**	.49**	.55**
SS	Thought Disorder	.62**	.56**	.59**
CC	Major Depression	.74**	.65**	.67**
PP	Delusional Disorder	.23**	.19	.17

* $p \leq .05$, ** $p \leq .01$ (two-tailed)

APPENDIX 3.1

Table. 54. Types of traumas treated for each participant.

Part. number	First trauma treated using EMDR	Second trauma treated using EMDR	Third trauma treated using EMDR
Individual personally involved in life threatening event/s			
1	Child sexual assault		
2	Childhood physical assault		
3	Childhood physical assault		
4	Adult physical assault		
5	Adult physical assault		
6	Domestic violence		
7	Domestic violence		
8	Road traffic accident		
9	Road traffic accident		
10	Road Traffic accident		
11	Road traffic accident		
12	Traumatic Birth		
13	Traumatic birth		
14	Traumatic birth		
15	Adult victimisation - Prison	Adult physical assault	
16	Adult physical assault	War - Wife of soldier living in war zone.	
17	Domestic violence	Relationship difficulty. Parents divorced	
18	Road traffic accident	Childhood sexual abuse	
19	Traumatic birth	Bullied at school	
20	War – Combat, Falklands	War – Combat, Gulf 1990s	
21	Child Burn victim	Traumatic illness. Son has life threatening illness.	Relationship difficulty. Other son rejected family.
Witnessed life threatening event/s			
22	Traumatic loss. Wife died, difficult youngest daughter.		
23	Traumatic loss. Cousin killed in bus crash. Watched body laid out on TV.		
24	Road traffic accident - fatality		
25	Traumatic loss. Ex wife killed in road traffic accident		
26	Termination	Traumatic loss. Found husband's body hanging.	
27	Road traffic accident - fatality	Termination	
28	Traumatic loss Father died of AIDS	Adult victimisation Bullied at work	
29	Child sexual abuse by step father.	Abandoned by partner when pregnant at 18.	Adult victimisation Bullied at work.
Non life threatening incident/s			
30	Relationship difficulty. Parents divorced.		
31	Relationship difficulty. Mentally ill mother.	Traumatic loss. House repossessed	
32	Relationship difficulty. Husband's affair & divorce.	Difficulties with adoptive daughter	

APPENDIX 3.2

Table 55. Number of sessions of EMDR treatment per trauma for each participant.

Participant number	Number of sessions to treat first trauma*	Number of sessions to treat second trauma	Number of session to treat third trauma	Total number of sessions
Individual personally involved in life threatening event/s				
1	2			2
2	2			2
3	3			3
4	4			4
5	6			6
6	6			6
7	7			7
8	7			7
9	8			8
10	9			9
11	9			9
12	11			11
13	12			12
14	12			12
15	3	2		5
16	6	3		9
17	8	8		16
18	11	5		16
19	16	7		23
20	12	12		24
21	6	3	2	11
Witnessed life threatening event/s				
22	8			8
23	8			8
24	10			10
25	11			11
26	4	3		7
27	13	4		17
28	3	18		21
29	4	8	4	16
Non life threatening incident/s				
30	8			8
31	7	4		11
32	10	5		15

*The first session of the treatment of the first trauma consisted of relaxation techniques.