Imagery Re-Scripting for PTSD: Session Content and its Relation to Symptom Improvement

Caroline Salter

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Abstract

Intrusive images are a common phenomenon in post-traumatic stress disorder (PTSD; American Psychological Society, 2013). Imagery-Rescripting (ImRs; Arntz & Weertman, 1999) is an experiential technique for targeting intrusive images and is gaining popularity as a treatment for PTSD (Arntz, 2012). Although there is evidence to suggest that ImRs is an effective treatment of PTSD (see Arntz, 2012), it is currently unclear how ImRs works. The aims of the present study were 1) to develop a coding scheme that captured important factors of ImRs session, and 2) to apply this coding scheme prospectively to investigate how certain factors might relate to treatment outcome. The study used thematic analysis (Braun & Clarke, 2006) to develop an ImRs coding scheme. Next, a single case experimental design was employed to track six participants over the course of their ImRs therapy for PTSD. Session content captured by the coding scheme was compared to changes in weekly outcome measures to investigate whether the presence of certain codes related to a reduction in PTSD symptoms. Results suggested a number of factors might be important for determining treatment outcome. Specifically, *Attitude towards ImRs, Activation of the image, Ability to follow ImRs, Activation of original internal processes* and *internal processes during the re-script, Believability* and *Attitude towards the outcome* are suggested as potentially important factors for determining ImRs efficacy. Study strengths, limitations and clinical implications are discussed. Recommendations for future research, including in-depth investigation of individual factors are suggested.

List of Tables

List of Figures

Table of Contents

1. Introduction

Post-traumatic stress disorder (PTSD) is a condition characterised by the presence of intrusive images or "contents of consciousness that possess sensory qualities as opposed to those that are purely verbal or abstract" (Hackmann, 1998, p. 301) that are related to the traumatic event (American Psychiatric Association (APA), 2013). Traditional trauma-focused therapies have focused on exposure to traumatic memories and updating maladaptive cognitions associated with these memories (National Collaborating Centre for Mental Health (NCCMH), 2005). More recently, Imagery Re-Scripting (ImRs) has gained increasing support as a treatment for the intrusive images experienced by those with PTSD. However, little is known about how and why ImRs is effective (Arntz, 2012). The present study aims to devise a coding scheme that captures features of ImRs sessions, and use this coding scheme to investigate what makes ImRs an effective treatment for intrusive images in PTSD.

What is PTSD?

PTSD is a common reaction to "actual or threatened death, serious injury or sexual violation" (APA, 2013). Symptoms of PTSD include re-experiencing, avoidance, negative cognitions, low mood and hyper-arousal. Individuals with PTSD experience recurrent dreams, flashbacks or intense or prolonged psychological distress. Avoidance of distressing memories, thoughts, feelings or external reminders of the event is common. Individuals can have persistent and distorted sense of blame of self or others, estrangement from others, severely reduced interest in activities and an inability to remember key aspects of the event. Individuals may also experience aggression, reckless or self-destructive behaviour, sleep disturbances and hyper-vigilance (APA, 2013).

Intrusive images in PTSD. Intrusive images are a normal part of day-to-day mental experience (Rusch, Grunert, Mendelsohn, & Smucker, 2000). For many, such images are fleeting and are easily dismissed (Rachman & de Silva, 1978). In PTSD however, intrusive images are associated with intense re- experiencing of all or part of the traumatic event (Birrer, Michael, & Munsch, 2007) and a lack of temporal awareness (Hackmann, Ehlers, Speckens, & Clark, 2004). Such intrusions can take the form of a complete "flashback", where the original event is re-lived in full, or briefer sensory fragments of the traumatic experience (Ehlers et al., 2002), accompanied by a sense of current threat and "nowness" (Brewin, Dalgleish, & Joseph 1996; Ehlers & Clark, 2000; Foa & Rothbaum, 1998).

Intrusions can take many forms including sounds, smells, tastes, or bodily sensations such as pain (Hackmann et al., 2004). Intrusive visual images appear to be the most common phenomena (Ehlers & Steil, 1995; Ehlers et al., 2002). For the majority of individuals with PTSD, intrusive images relate to the subjectively reported worst moments of the trauma, otherwise known as "hotspots", the moments occurring just before these hotspots and/or to imagined scenarios that have a strong thematic connection to the traumatic event (Grey, Holmes, & Brewin, 2001; Grey & Holmes, 2008; Hackmann et al., 2004; Holmes, Grey, & Young, 2005; Reynolds & Brewin, 1999). Intrusive images are one of the main symptoms that prompt individuals to seek help.

Treatment for PTSD

In the UK, current evidence suggests that exposure-based trauma-focused interventions such as imaginal exposure, trauma-focused cognitive behavioural therapy (TF-CBT) and eye movement desensitization and reprocessing (EMDR) are the most effective treatments for PTSD (NCCMH, 2005). Exposure techniques involve asking individuals to recall the details of the traumatic event while focusing their attention on any occurring sensory

feelings, thoughts and emotions (Arntz, Tiesema, & Kindt, 2007). The aim behind such techniques is firstly to allow individuals to emotionally "process" the trauma memories more fully so that they are less easily triggered and not experienced as distressing flashbacks (Holmes, Arntz, & Smucker, 2007). Second, individuals are helped to update previously held maladaptive beliefs about the trauma and its sequelae using verbal cognitive re-structuring (Hirsch & Holmes, 2007; Kindt, Buck, Arntz, & Soeter, 2007). The effectiveness of these techniques has been well documented (Rusch et al., 2000) and effect sizes are large (Kleim et al., 2013).

Despite the evidence base behind these techniques, a number of findings raise questions regarding the efficacy of exposure-based techniques. Firstly, cognitive therapy, which involves little re-living or exposure to the traumatic event has been shown to be highly effective (Ehlers, Clark, Hackmann, McManus, & Fennell, 2005). Therefore, exposure *per se* may not be the key ingredient. Secondly, exposure techniques seem most effective when the predominant trauma-related emotion is fear (Smucker & Dancu, 2005). When emotions such as guilt, shame, anger and self-blame prevail, treatment can appear more limited (Grey et al., 2001). Indeed, some suggest that when shame is the predominant emotion, traditional re-living techniques may be re-traumatising (Lee, Scragg, & Turner, 2001) and may impede emotional processing (Ehlers & Steil, 1995). Researchers and clinicians alike are now considering other techniques to facilitate change (Arntz & Weertman, 1999).

Imagery Re-Scripting

ImRs is an experiential technique that specifically targets intrusive images (Smucker, 2004). It has gained much interest in recent years (Edwards, 2007). Typically, ImRs takes place over a number of weekly sessions. During ImRs, the individual is asked to focus on the

content of their intrusion. The client gives a detailed oral description of the intrusion including details about the event, surroundings, sensory experiences, thoughts and feelings. Clients are then asked what outcome they would have liked to have occurred and are guided by their clinician to use their imagination to introduce image that allow them to reach their desired outcome (Hackmann, 1998). In doing so, ImRs combines imagery, verbal processing and schema modification in an attempt to reduce intrusions, challenge maladaptive beliefs linked to the intrusion and promote adaptive coping strategies (Rusch et al., 2000). It may take multiple attempts to introduce an effective change. Additional intrusions can be treated in the same way (Arntz & Weertman, 1999; Hackmann, 2005; Smucker, Dancu, Foa, & Niederee, 1995; Smucker & Dancu, 2005; Wheatley, Hackmann, & Brewin, 2009; Wheatley & Hackmann, 2011). Unlike in traditional TF-CBT, active verbal challenging of cognitions is rare (Brewin et al., 2009).

Although ImRs broadly follows the guidelines set out above, a number of variations exist. Some (e.g., (Arntz & Weertman, 1999; Young, Klosko, & Weishaar, 2003) have advocated the use of treatment manuals and recommend that the client re-lives the trauma in full first, before introducing changes. In practice, clients often struggle to re-live the full trauma, dissociate when they attempt to do so (Arntz, Sofi, & van Breukelen, 2013). As a result, newer techniques involve a more emergent style (e.g., Wheatley & Hackmann, 2011) where ImRs can be employed without first having re-lived the trauma in full. ImRs methods also vary in the amount of guidance given by the therapist, and the length of the ImRs session. Some re-scripts take no more than 10-15 minutes and others last an hour (Arntz et al., 2013, 2007). In this way, there are numerous methods a clinician could employ when using ImRs as a treatment for PTSD.

Efficacy of ImRs. The evidence base behind ImRs is growing. ImRs can reduce the intensity of nightmares (Davis & Wright, 2006; Krakow & Zadra, 2006) and provide substantial relief from distress associated with intrusive images (Rusch et al., 2000). In their uncontrolled, open trial, Grunert, Weis, Smucker and Christianson (2007) found that ImRs was a helpful treatment when imaginal exposure for accident-related PTSD failed. Arntz et al. (2013) used a single case experimental design to investigate the efficacy of ten sessions of ImRs as a standalone treatment for complex PTSD in ten refugees. Compared to verbal exploration, ImRs significantly reduced scores on the Posttraumatic Symptom Scale, with nine participants no longer reaching the recommended clinical cut-off for PTSD.

ImRs has also been incorporated into other treatment models. ImRs combined with cognitive therapy for PTSD has shown strong treatment effects (Ehlers et al., 2005). ImRs with imaginal exposure has been found to be superior to no treatment and is associated with reduced drop-out, PTSD symptoms, anger, control, shame and guilt and therapist helplessness compared to exposure alone (Arntz et al., 2007; Kindt et al., 2007). However, it is unclear how much these effects can be attributed to ImRs alone, rather than to other or combined elements of the full treatment package.

In summary, although only a handful of studies have tested to what degree ImRs offers an effective and complete treatment, existing studies imply that ImRs is a viable addition to standard treatment packages (Arntz, 2012). However, despite the apparent successes, there has been little, if any, systematic investigation of the mechanisms behind ImRs as a therapeutic technique (Arntz, 2012). As a result, it is unclear why or how ImRs leads to reductions in distress. The present study is the first to our knowledge to begin to untangle the various factors that might be relevant for understanding the efficacy of ImRs as a treatment for PTSD.

Causes of Intrusive Images

To understand how ImRs might impact on intrusive images, it is necessary to consider why some images become intrusive. Many authors have attempted to explain the presence of intrusive images in PTSD and the associated intense emotional response (e.g., Brewin, Dalgleish, & Joseph, 1996; Brewin, Gregory, Lipton, & Burgess, 2010; Ehlers & Clark, 2000; Foa & Kozak, 1986). Although precise terminology differs, most theories agree that two memory systems are involved. The first memory system, known as "Cold memory" (Conway & Pleydell-Pearce, 2000), "verbally accessible memory" (VAM, Brewin, Dalgleish, et al., 1996) or "C-reps" (Brewin et al., 2010) depending on the model in use, describe memories containing contextualised information about events in an individual's life. These can be recalled and dismissed at will (Neuner et al., 2008).

The second memory system concerns the storage of memories that are formed during highly traumatic events. At these times, individuals focus only on key aspects of the event, creating fragmented, incomplete memories (Ehlers & Clark, 2000). These "hot memories", "situationally accessible memories" (SAMs) or "S-reps" contain detailed sensory, cognitive and emotional elements in the unique form in which they were experienced, but lack contextual information that anchors them in time and place (Brewin et al., 2010). They are easily triggered by matching cues in the environment, experienced as a true event rather than a memory and result in a cognitive-affective experience of current threat (Brewin, Hunter, Carroll, & Tata, 1996). Although theories roughly agree on the presence of these two memory systems, they differ in their explanation of how these memories are triggered. Three such theories will be discussed here; the fear network theory, the dual representation theory and the warning signals hypothesis.

The fear network theory (Foa & Kozak, 1986). When individuals experience prolonged, repeated traumatic events, their hot memories link together in a "fear network", containing sensory, emotional, cognitive and physiological representations of events (Foa & Kozak, 1986; Lang, 2001). The greater the number of traumatic events that are experienced, the stronger the links between representations become. The stronger the links between representations, the more quickly the full network can be triggered by both internal and external stimuli (Elbert, Rockstroh, Kolassa, Schauer, & Neuner, 2006), leading to re-experiencing of the original event.

According to Foa, Steketee and Rothbaum (1989), three features of the memory structure promote intrusions. First, network activation is accompanied by intense hyper-arousal. To attempt to moderate arousal, individuals engage in avoidance behaviour, avoiding cues that may trigger anxiety. Avoidance prevents the individual from processing any material that contradicts the fear network, limiting the individual's ability to modify the network. Second, the authors claim that the fear network is large. When traumas influence what can and cannot be classified as safe, the fear network becomes over-inclusive, increasing the number of stimuli that could potentially activate the fear network and its associated responses. Given the size of the network, it proves difficult to match corrective information to the appropriate network components. As a result, keys parts of the network remain highly active, while other parts remain dormant and unchanged. Finally, given the large number of elements in the structure and the low threshold for structure activation, the likelihood of network activation and the occurrence of intrusions are high (Foa et al., 1989). When triggered, the individual further engages in behaviours designed to keep themselves safe (Long & Quevillon, 2009), once more preventing updating of the fear network.

Dual representation theory (Brewin, Dalgleish, et al., 1996; Brewin et al., 2010).

The dual representation theory places less emphasis on the fear network and more emphasis on two memory types. Contextual memories (C-reps) are defined as detailed memories that contain contextualising information and are viewed as being under the individual's control. Situational memories (S-reps) are defined as sensory snapshots of an event that are outside of conscious control. They spring to mind unbidden and can be associated with intense emotional arousal (Brewin et al., 2010). During the encoding of normal episodic memories, temporary perceptual information stored in S-reps is activated and integrated to form elaborated and contextualised C-reps. Information stored in S-reps then quickly decays, leaving behind memories that are autobiographical or narrative in nature and can be recalled and edited at will (Brewin, Dalgleish, et al., 1996).

At times of extreme danger however, memory processing is impaired. Information that is crucial for survival is captured but information that contextualises these details is not (Brewin et al., 2010). As in the fear network model, connections between S-reps and their associated emotional, behavioural and physiological responses are strong (Holmes, Mathews, Dalgleish, & Mackintosh, 2006; Holmes, Mathews, Mackintosh, & Dalgleish, 2008; Holmes & Mathews, 2005). Activation of one part of the S-rep can be rapidly triggered by internal or external stimuli including physical cues, emotional states, and physiological sensations (Ehlers & Clark, 2000). When S-rep activation is particularly intense, the full emotional experience that was present at the time of the original event becomes activated (Hackmann et al., 2004; Holmes et al., 2008; Holmes & Mathews, 2005; Lang, 2001), creating vivid intrusions that feel as though they are happening in the present moment (Birrer et al., 2007; Michael, Ehlers, Halligan, & Clark, 2005). This results in intense emotional distress (Reynolds & Brewin, 1999) including feelings of fear, sadness, anger, anxiety, shame or

helplessness (Brewin, Andrews, & Rose, 2000; Grey et al., 2001; Speckens, Hackmann, Ehlers, & Cuthbert, 2007).

To prevent such a response, there is often marked cognitive and behavioural avoidance of S-rep activation (Brewin et al., 2010; McIsaac & Eich, 2004), which can reduce emotional distress in the short-term (D'Argembeau & Van der Linden, 2006). However, long-term avoidance prevents individuals from locating their experience in time and space (Richards & Gross, 2000). Instead, information remains stored as highly distressing and intrusive S-reps (Brewin et al., 2009; Kuyken & Brewin, 1994; Spenceley & Jerrom, 1997; Williams & Moulds, 2007), which are easily triggered and can create a feeling of being "trapped in the trauma" (Wilson & Zigelbaum, 1986, p. 307). Memory suppression prevents individuals from updating appraisals of the traumatic event with additionally learnt information (Ehlers & Clark, 2000). Such appraisals heighten levels of distress, promoting further use of avoidance as a coping mechanism. Avoidance makes differentiation of the trauma memory from other related memories difficult (Baddeley, 1997). As a result, discrimination between stimuli present during the trauma and related, but harmless stimuli is impaired, increasing the chances that a feeling of threat will be triggered unnecessarily (Hirsch & Holmes, 2007).

In summary, the dual representation theory argues that intrusive images in PTSD are maintained when brief, but easily triggered S-reps of the original event are associated with such high levels of distress that they are avoided. While avoidance helps to reduce distress in the short term, it prevents S-reps from being adequately encoded and contextualised into C-reps. Instead, individuals are left with highly distressing and intrusive images of the traumatic event, which further impact on mood and functioning.

Warning signals hypothesis. An alternative theory is provided by Ehlers and Clark (2000) and draws on learning theory (Watson & Rayner, 1920). According to learning theory, when a neutral stimulus is repeatedly paired with an aversive event (unconditioned stimulus, US), the neutral stimulus acts as a predictor (conditioned stimulus, CS) for the occurrence of the US. Such expectation can lead to anticipatory fear (the conditioned response, CR) when the CS is presented (Dibbets, Poort, & Arntz, 2012). According to Ehlers and Clark (2000), cues present at the time of traumatic events come to act as predictors for imminent danger. These cues will be mostly visual in nature (Ehlers et al., 2002). The theory argues that presence of these cues results in activation of the CR (e.g., fear), regardless of whether threat is actually present in the environment or not. In this way, presence of threat-related cues signal danger to the individual with PTSD and triggers the associated emotional response present at the time of the original traumatic event.

More recent studies have indicated that acquisition of a conditioned response can take place even when there is no direct CS-US pairing. Instead, pairing an actual CS with a mentally imagined US can evoke a CR on subsequent CS presentations (Dibbets et al., 2012). Simply thinking about the original traumatic event in the form of intrusive images can result in the presence of the CR, strengthening the link between the intrusive image and emotional response.

Implications for Treatment

All three of the above theories emphasise the importance of corrective learning in order to reduce the distress associated with cognitions. The fear network theory suggests that treatment should be most effective when the fear network is activated in the presence of corrective information that challenges erroneous associations and evaluations (Foa & Kozak, 1986). The dual representation theory claims that effective treatment should

encourage individuals to access, process and contextualise all information contained in S-reps in order to create a coherent account of the traumatic event. Finally, the warning signals hypothesis implies that repeatedly pairing the feared CS with neutral or positive outcomes will alter the CR (Arntz, 2012; Dibbets et al., 2012). All theories imply that the aim of treatment should be to help individuals overcome avoidance so that they can learn that objectively safe situations and memories of the trauma are not dangerous despite the symptoms they trigger, that anxiety decreases given the right conditions and that symptoms of PTSD to not indicate a loss of control (Foa & Meadows, 1997).

How Might ImRs Work?

Given the above theories and the importance they place on exposure, the use of ImRs seems paradoxical as an intervention for PTSD. If activation of the original memory and exposure to that memory is important for symptom reduction, how can imagining an alternative ending lead to a reduction intrusive memories and their associated distress? Currently, there is no definitive answer to this question, although a number of theories have been suggested, described below.

Creating a competing memory. The retrieval competition account suggests that ImRs creates an alternative, highly accessible memory that is less toxic than the original representation of traumatic events and can compete with the original intrusive memory (Brewin, 2006). Rather than changing the original memory, the ImRs image competes for retrieval with the original, negative one, regardless of image accuracy (Brewin, 2006). Provided that the new representation is more accessible in response to retrieval cues, activation of the original traumatic memory will be inhibited (Brewin et al., 2009; Frets, Kevenaar, & van der Heiden, 2014; Wheatley et al., 2007). The theory suggests it is not

habituation to the original image that is important for determining treatment efficacy, but the ability for the new image to inhibit activation of the old image.

Image vividness in ImRs. If ImRs efficacy is determined by the accessibility of the new image, interventions that promote accessibility should lead to better outcomes. One way in which images can be made more easily accessible is through maximising vividness. Vividness has been described as the "luminosity and clarity of mental imagery, as well as the extent to which an individual's subjective experience of imagery is similar to actual perceptual experience" (Pearson, Deeprose, Wallace-Hadrill, Burnett Heyes, & Holmes, 2013, p. 7). Activation of one sensory modality can prompt subsequent activation in others, promoting vividness further (Greenberg & Rubin, 2003).

The more vivid an image the more likely it is to be recalled, regardless of image accuracy (Carroll, 1978; Gonsalves et al., 2004; Hyman & Pentland, 1996; Johnson, 2006; Tversky & Kahneman, 1973). Indeed, brain activity for highly vivid, but imagined visualisations is similar to that produced when an object is actually seen (Gonsalves et al., 2004). Vivid image activation can be self-maintaining in that the more an image is brought to mind, the easier accessing the image becomes (Tversky & Kahneman, 1973). It is therefore suggested that ImRs works by guiding individuals to create vivid, alternative, less distressing images that become easier to bring to mind than the original distressing image.

Although plausible, there are caveats to this theory. First, no research has, as yet, investigated whether steps to improve accessibility improve ImRs efficacy. Second, measurement of accessibility is abstract and subjective. Some researchers have assumed that asking people to describe an event in detail creates a vivid image (e.g., Hyman & Pentland, 1996) whereas others use image questionnaires (e.g., D'Argembeau & Van der Linden, 2006). Without consistent measurement, comparison of results becomes difficult.

Third, accessibility could be promoted in numerous ways. If change is surprising, it is more likely to be remembered than change that was expected and thus may have the ability to compete more (Anrtz, 2014, personal communication). It is unclear which characteristics promote accessibility. Furthermore, focusing on a positive but unrelated image has a far smaller impact on intrusions than images created as part of ImRs (Hagenaars & Arntz, 2012). Alternative images seem beneficial only when related to the original image, the individual's idiosyncratic appraisal of that image and when followed by modification of dysfunctional beliefs and assumptions about the initial event (Kindt et al., 2007). Simply increasing the accessibility of a new image alone does not seem to be enough to reduce distress.

Emotions in ImRs. Current evidence suggests that treatment for PTSD should promote elaboration and contextualisation of the intrusion and its associated emotional content (Brewin et al., 2009; Ehlers & Clark, 2000). Therefore, while vivid, but emotionally unrelated images may not be strong enough to compete with the old intrusion (Wheatley & Hackmann, 2011) or promote contextualisation (Holmes & Mathews, 2010), the creation of accessible images that are emotionally relevant might. By facilitating access to emotional responses, ImRs may reduce emotional suppression and attempts to constantly monitor and control emotional responses (Richards & Gross, 2000), which in turn may promote contextualisation of the memory. Indeed, ImRs has been found to trigger emotions associated with the original intrusion (Brewin et al., 2009) and to a greater extent than verbal processing (Arntz, 2012). Conversely, verbal worry following a traumatic event correlates with increased intrusions in comparison to imagining the traumatic event (Butler, Wells, & Dewick, 1995). These results suggest that re-imagining the traumatic image facilitates emotional processing which in turn may reduce the frequency of intrusions.

Field versus observer perspectives. If ImRs efficacy is determined by emotional processing, interventions that promote access to these emotions should lead to better outcomes. One way to promote emotional processing is through the adoption of a "field perspective" where images are viewed and described as if the individual were re-living the scene as it was experienced during the original event (Nigro & Neisser, 1983). Memories recalled when adopting a field perspective tend to include detail about emotional reactions and sensations (McIsaac & Eich, 2004). By contrast, an "observer perspective" refers to those images that are perceived as if watching the event unfold from afar (Nigro & Neisser, 1983). Memories perceived in this way tend to include more information about spatial relations and physical appearance than about emotional reactions and sensations (McIsaac & Eich, 2004).

Situations involving high levels of physical threat such as those leading to PTSD give rise to more observer than field recollections of the traumatic event (Nigro & Neisser, 1983). By adopting an observer vantage point, people with PTSD can mentally distance themselves from the traumatic event (McIsaac & Eich, 2004). However, observer perspective recall does not allow for full retrieval of the original memory. Relevant information cannot be accessed and contextualised, further maintaining symptoms (Brewin et al., 2010). If, as has been suggested, memories recalled from a field perspective include emotional reactions and sensations, then by using ImRs to promote adoption of a field perspective, the individual should experience more complete activation of affective reactions, physical sensations and psychological states that match the original trauma memory (Brewin et al., 2010), facilitating emotional processing.

While this argument has face validity, limitations must be noted. First, the studies used to support this argument tend to be small scale, with no control group. Second, no study has explicitly tested emotional versus non-emotional ImRs, or field vs. observer ImRs,

making this hypothesis theory only. Third, it is unclear how much of the original emotional response should be accessed. It is possible that accessing the full emotional response could be harmful to some individuals if distress is too intense (Brewin et al., 2009). If so, then adoption of an observer perspective may prove useful when attempting to access contextual details that are unavailable when distress during image recall is intense. It is possible that a combination of techniques aimed at both accessing and modulating emotions will be more helpful in processing the memory effectively. Finally, if accessing the original emotion was the only important factor in ImRs, traditional re-living without ImRs should be sufficient. However, the efficacy of re-living has been questioned when the associated emotion is not fear based (Lee et al., 2001). These findings imply that there is something specific and additional offered by ImRs that is not captured by traditional re-living techniques.

Introducing emotional change. One of the key differences between re-living and ImRs is that ImRs involves actively changing the outcome of the image and thus the associated emotional response. It is possible that ImRs efficacy is determined not by the extent to which original emotions are accessed, but by the extent to which the new image creates a shift away from the original emotional response. The more an image is linked with an emotion, the more easily the new image is remembered (Bywaters, Andrade, & Turpin, 2004; Rubin & Siegler, 2004). Activation of old memory, blended with new, more positive emotions may either create a C-rep with the ability to compete with the old representation of the event (Brewin et al., 2010)

Many individuals choose to generate absurd or humorous changes to their images (Rusch et al., 2000). The associated positive emotion may directly inhibit the negative arousal associated with the original intrusion (Rusch et al., 2000; Wolpe, 1958, 1995). Individuals may feel that it is safe to approach parts of the old memory in the knowledge

that the full distressing emotional response is partly inhibited, allowing new emotions to become incorporated into the fear network in place of the old fear response. Alternatively, ImRs may change the relationship to the initial trigger. Specifically, individuals may learn that triggers do not have to result in activation of the original image or the associated negative emotions or beliefs. The more that triggers activate the new re-script rather than the original image, the weaker the links between the CS and CR become or, the more inhibited the CR becomes as a new CS–US develops (Craske et al., 2008), limiting the associated distress (Ehlers & Clark, 2000).

In summary, ImRs may alleviate distress by weakening the association between the intrusion and feared outcome and by allowing individuals to update their intrusive memory with more positive and thus less distressing emotions, which in turn facilitate further emotional processing by reducing cognitive avoidance. However, the link between emotion and outcome is not straightforward. Numerous emotions could be accessed during ImRs (Young et al., 2003) including mastery (Wheatley et al., 2007), control (Smucker et al., 1995) and self-efficacy (Smucker, 2004). Some individuals report experiencing sadness at the end of ImRs. Although not traditionally seen as a positive emotion, expression of emotions such as sadness or regret may still be associated with positive outcomes in ImRs (Arntz & Weertman, 1999) and might be a sign of "healthy" grief and loss. Therefore, it is unclear whether it is the valence of the final emotion that is important, or a shift in emotion that facilitates change.

Mastery and compassion. To address these questions, researchers have begun to investigate the importance of specific emotions in ImRs. Mastery and compassion are two emotions that have become the focus of investigation. When beginning ImRs, individuals often report a desire to regain control or "mastery" (Smucker et al., 1995; Smucker & Dancu,

2005). According to the model of meta-cognitive worry (Wells & Sembi, 2004; Wells, 1995), individuals who believe their intrusions are uncontrollable or unacceptable are more likely to experience distress. It is possible that through the direct modification of intrusions, ImRs allows individuals to directly challenge feelings of helplessness, victimisation and loss of control (Ehlers et al., 2005). It is suggested that ImRs helps to modify beliefs about intrusive memories, enhancing self-efficacy and emotional processing (Germain et al., 2004; Gollwitzer, Meder, & Schmitt, 2011; Smucker et al., 1995).

One way of achieving mastery in ImRs is to encourage people to imagine taking revenge against perpetrators, which can promote feelings of control (Holmes et al., 2005) and safety (Seebauer, Froß, Dubaschny, Schönberger, & Jacob, 2014). Concern has been raised regarding revenge fantasies, as imagining acting out certain behaviours has been shown to increase the likelihood of engaging in those behaviours (Carroll, 1978). These concerns do not appear justified. Seebauer et al. (2014) found that ImRs involving revenge did not lead to increases in anger, rage or aggression in comparison to ImRs without revenge. Instead, seeking revenge may help individuals to process emotional responses that were previously inhibited and thus to update the corresponding memories and their associated responses (Gollwitzer et al., 2011; Haen & Weber, 2009).

An additional emotion that has attracted interest is compassion (Gilbert, 2005a). Feelings of compassion are rare in spontaneous intrusive images. However, by introducing compassion, individuals are often able to indirectly challenge the validity of feelings such as self-blame, shame or worthlessness (Hackmann, Bennett-Levy, & Holmes, 2011; Hackmann, 2005; Smucker, 2004). Researchers have gone so far as to suggest that experiencing compassion in imagery activates specific neural pathways. Providing a compassionate experience in ImRs may “switch on” these pathways and promote their activation in

response to later compassionate care signals (Gilbert, 2005a). Thus, ImRs has the potential to give individuals the true felt experience of being safe and cared for.

Despite these suggestions, no study has explicitly investigated the whether introduction of certain emotions over others improves the efficacy of ImRs. It is unclear how best to combine them during ImRs, or what their relative contributions to change are (Wheatley & Hackmann, 2011) or why the introduction of typically non-positive emotions such as anger can lead to a reduction in distress. Clearly, this area requires further, substantive investigation.

Modifying maladaptive beliefs. Introducing new emotions through ImRs may help reduce distress by creating a shift in the way an individual feels about both the traumatic event and the presence of PTSD symptoms. In doing so, ImRs might facilitate updating of interpretations associated with self-defining intrusions (Hackmann et al., 2011; Wheatley & Hackmann, 2011). Imagery has the potential to elicit intense emotional responses (Holmes et al., 2008; Holmes & Mathews, 2005) which are closely linked to schematic representations of self and others (Lee et al., 2001). Therefore, imagery of the original intrusion is likely to activate negative emotions and subsequent negative affect-laden thoughts such as “it’s my fault” and “I’m damaged”.

If negative imagery can trigger negative cognitions, it seems plausible that the expression of positive imagery should facilitate access to positive cognitions. In doing so, ImRs might create a fundamental shift in thinking regarding the original event and subsequent intrusions (Long & Quevillon, 2009). In support of this argument, ImRs has been linked with a shift from feelings of helplessness, to attributions of self-efficacy and mastery (Rusch et al., 2000). Via connections with other existing representations, these additional details further modify the memory network, reducing the toxicity of the original image

(Wheatley & Hackmann, 2011; Wheatley et al., 2007) and associated distress (Brewin et al., 2009).

Emotional avoidance and ImRs. It has been argued that ImRs allows individuals to access blocked emotions and update the beliefs about the original traumatic event in order to create a consolidated memory of the event that can be controlled by the individual (Brewin et al., 2010; Reynolds & Brewin, 1999). However, a concerning, alternative hypothesis exists. The fundamental principle of ImRs is that the client is allowed to change the ending of the image to a more positive outcome. In doing so, is it not possible that the insertion of more positive emotions perpetuates the desire to avoid the expression of negative emotion? If so, ImRs may only lead to short-term relief from intrusive images and may cause long-term harm by fuelling the very avoidance it is trying to overcome. Indeed, avoidance has been associated with immediate and ongoing PTSD symptoms and an overall poorer prognosis (Kenny & Bryant, 2007).Taking this argument to its extreme, individuals who are told by a therapist to focus on a more positive ending could feel as if the therapist is telling them that the event is not important and that they should simply forget about it. This has potentially severe implications for the therapeutic relationship and subsequent treatment outcome (Keller, Zoellner, & Feeny, 2010).

Current evidence suggests ImRs does not involve denial of the factual details of the event (Wheatley & Hackmann, 2011). Instead, ImRs focuses on what the client should have experienced at the time, making it clear what was wrong with the original event. Furthermore, ImRs has been found to enhance recall of traumatic material, while simultaneously reducing distress in comparison to unrelated positive imagery or imaginal exposure (Hagenaars & Arntz, 2012). Links have been drawn between mindfulness based cognitive therapy (Ma & Teasdale, 2004) and ImRs as both encourage clients to acknowledge

the emotional content of mental events and change their relationship with that event through reflection and elaboration, (Holmes & Mathews, 2010; Wheatley & Hackmann, 2011). This then promotes a sense of empowerment (Rusch et al., 2000; Smucker, 2004), rather than encouraging suppression and avoidance. It seems that ImRs changes the meaning of the original experience, rather than replacing or erasing the factual details of the memory (Arntz, 2012).

Summary. Theory suggests that ImRs facilitates the creation of an image that is accessible enough to compete with the original intrusive image. Given the emotional overlap with the original image, the process of ImRs facilitates activation of fragmented trauma memories, which, when combined with new emotions and a resultant shift in beliefs about the trauma, facilitates the development of a fully elaborated memory that is non-threatening, feels non-pathological (Rusch et al., 2000) and can be controlled and manipulated at will.

Present Study

As discussed above, several theoretical approaches exist that could explain ImRs efficacy. While plausible, the current status of research means that gaps in knowledge exist and explanations remain theoretical. While there are a number of possible mechanisms that could explain or influence ImRs efficacy, no study to our knowledge has systematically reviewed what happens during ImRs and how this might relate to outcome. Without such research, it is impossible to determine why, when and for whom ImRs proves a successful treatment for intrusive images and whether additional modifications could be made to further improve outcome. This study aims to take the first step towards investigating how ImRs has the potential to reduce the distress associated with intrusive images.

Before investigating ImRs mechanisms, a barrier needs to be addressed. Currently, there is no agreed methodology for evaluating ImRs session content. Without such a framework, it is difficult to determine which aspects of ImRs might relate to outcome. Therefore, before exploring potential ImRs mechanisms, a method by which to examine the process of ImRs needs to be developed. The present study then had two aims. The first was to devise a coding system which captures salient characteristics of single ImRs sessions in order to provide a framework for the exploration of ImRs mechanisms (Phase 1). The second aim was to use this coding system to investigate which, if any, characteristics predict symptom improvement in individuals with PTSD (Phase 2).

Phase 1 of the study involved collecting and transcribing pre-existing recordings of ImRs sessions in order to systematically summarise and quantify ImRs components. In addition to ImRs sessions for PTSD, ImRs sessions for depression were included in this phase. This decision was taken for a number of reasons. First, ImRs for depression and ImRs for PTSD both target intrusive images by changing the ending of the distressing image (Brewin et al., 2009). Second, there are many similarities between intrusive images in depression and PTSD (Breslau, Davis, Peterson, & Schultz, 2000; Brewin, Hunter, et al., 1996; Kuyken & Brewin, 1994; O'Donnell, Creamer, & Pattison, 2004; Reynolds & Brewin, 1999). Depression intrusions have been likened to "hotspots", or the worst moment of the event experienced by individuals with PTSD (Grey et al., 2001; Grey & Holmes, 2008; Holmes et al., 2005). Some authors have gone so far as to say that depression and PTSD lie on a continuum of responses to traumatic life events (Friedman et al., 2011) with shared predictive variables and vulnerabilities (Breslau et al., 2000; O'Donnell et al., 2004). Finally, the use of both depression and PTSD recordings means that the coding system would be over-inclusive. It is considered unlikely that anything would be excluded through the inclusion of depressed participants.

Phase 2 of the study prospectively applied the coding scheme devised in Phase 1 to individuals' ImRs sessions for PTSD using a single case experimental design (SCED). The present study followed six participants over the course of ImRs sessions. Participants were recruited from outpatient and inpatient anxiety services in London. They were asked to complete a range of self-report questionnaires (the Patient Health Questionnaire-9, Impact of Event Scale and four Visual Analogue Scales) to determine symptoms of low mood, the impact of their traumatic experience on current well-being and the distress associated with intrusive images over the course of treatment. Their responses were used to determine whether ImRs session characteristics identified in Phase 1 related to symptom improvement.

Despite concerns that case studies are unscientific and based on anecdotal evidence (Morgan & Morgan, 2001), SCEDs are now seen as a viable alternative to randomised controlled trials (RCTs; Kazdin, 1998). Assuming methodological constraints such as stable baselines, well specified treatments and objective and repeated measurements are put in place, SCEDs enable researchers to track distinct change processes closely. Unlike RCTs, which have been criticised for over-simplifying the complex nature of casual relationships (Haynes & O'Brien, 2000), SCEDs aim to replicate findings across heterogeneous individuals. Findings are rarely limited to one individual at one set point in time (Barlow & Hersen, 1984) and can be solid, replicable and empirical across a range of domains (Morgan & Morgan, 2001, p. 120), enabling a more complete understanding (Elliott, 2002). SCEDs offer in-depth analysis and exploration of new treatment approaches and implementation (Turpin, 2001) and help to highlight potential mechanisms of change (Kazdin, 2007). This makes SCED a feasible option for beginning to unpack the mechanisms involved in ImRs.

Given the lack of focused research in this area, the present study takes a largely exploratory approach to investigate ImRs characteristics, taking existing theoretical models into account. If the factors outlined so far are indeed important, it is expected that ImRs that

is more vivid and associated with both the expression of and shift in emotions and beliefs about the traumatic image should be more effective at reducing distress associated with intrusive images. It is hoped that the present study will provide a preliminary framework for studying ImRs that can guide later rigorous investigation of specific factors. Ultimately, it is hoped that increased understanding of ImRs mechanisms will help to maximise ImRs outcomes for individuals experiencing PTSD.

2. Method

The study was split into two phases, Phase 1 to develop the coding scheme and Phase 2 to prospectively apply the coding scheme to a second group of participants to investigate how codes might relate to change in outcomes over time.

Participants

Ethical approval. The study was conducted in two National Health Service (NHS) Mental Health Trusts. Ethical approval was granted through the North West-Lancaster National Research Ethics (NRES) Committee on 22nd May 2013 (Appendix 1). A substantial amendment was made to the Lancaster NRES committee and approval granted on 16th October 2013 (Appendix 2). Subsequent approval was granted by Royal Holloway University Departmental Ethics Committee (RHUL DEC) and local Research and Development (R&D) departments. Approval letters can be found in Appendix 3-Appendix 7.

Phase 1. Phase 1 involved analysis of recordings of therapy sessions with nine participants seeking treatment for depression or PTSD in one of two outpatient psychology services in London. The recordings had been made before the study was conceived. Three of the participants had a primary diagnosis of PTSD and had received ImRs as part of their

treatment at an outpatient service. The remaining six had a primary diagnosis of depression and received ImRs as part of a study investigating the impact of ImRs on intrusive images in depression. Given that the recordings had not been collected explicitly for this study, only minimal information about participants can be given here. Of the nine participants, five were male and four were female. All were over the age of 18, spoke English and experienced intrusive images which they were willing to work on using ImRs. No participant had a psychotic disorder, organic brain disease, high risk of self-harm or suicide or were abusing substances.

Setting and treatment. Treatment was conducted in two outpatient services in London. The first was an outpatient service, specialising in TF-CBT. The second was a mood disorder service, specialising in CBT for depression and anxiety. Treatment was conducted by three experienced clinical psychologists. Participants in the depression study only received ImRs. Participants from the trauma service received ImRs as part of a larger treatment package of TF-CBT.

ImRs was based on the approaches previously used by Arntz & Weertman (1999), Hackmann (1998), Smucker, Dancu, Foa and Niederee (1995) and Smucker and Dancu (2005). Participants began by giving a detailed oral narrative of their intrusive image. Participants were then asked what they would like to change in the image. With clinician guidance, participants created an alternative, vivid image that incorporated these changes. Participants were asked to practice bringing this alternative image to mind at home between sessions. Later sessions involved making further modifications to the image, checking the ease with which the alternative image was accessed and working on additional intrusive images that had surfaced. Unlike traditional TF-CBT, there was no verbal evaluation of intrusive images or direct challenging of assumptions.

Phase 2. The number of participants recruited for the present study was based on previous suggestions by Shadish and Sullivan (2011), Shadish, Hedges and Pustejovsky (2014) and Arntz et al. (2013). The former found that the median number of cases used in SCEDs was three. However, Shadish et al. (2014) state that three cases will only yield power of .80 when there are at least 6 observations per phase and an anticipated effect size (δ) of 0.8. They recommend that when δ = 0.5, power is adequate with three observations per phase and seven cases. According to Arntz et al. (2013), a study with ten participants would have 80% power to detect a change of Cohen's *d*= 1 or higher at alpha= .05, two-tailed, if a paired t-test was used to evaluate the treatment effect.

In light of the above recommendations, Phase 2 aimed to recruit at least ten participants. However, only eight participants were approached by their treating clinician. Of the eight approached, one declined to take part. One experienced symptom improvement following traditional re-living so had no need for ImRs. The remaining six participants agreed to take part. The six participants (two females, four males) were participants seeking treatment for PTSD at either an outpatient (*n*=5) or inpatient (*n*=1) service in London. The flow of participants accepted into the study is depicted in Figure 1.

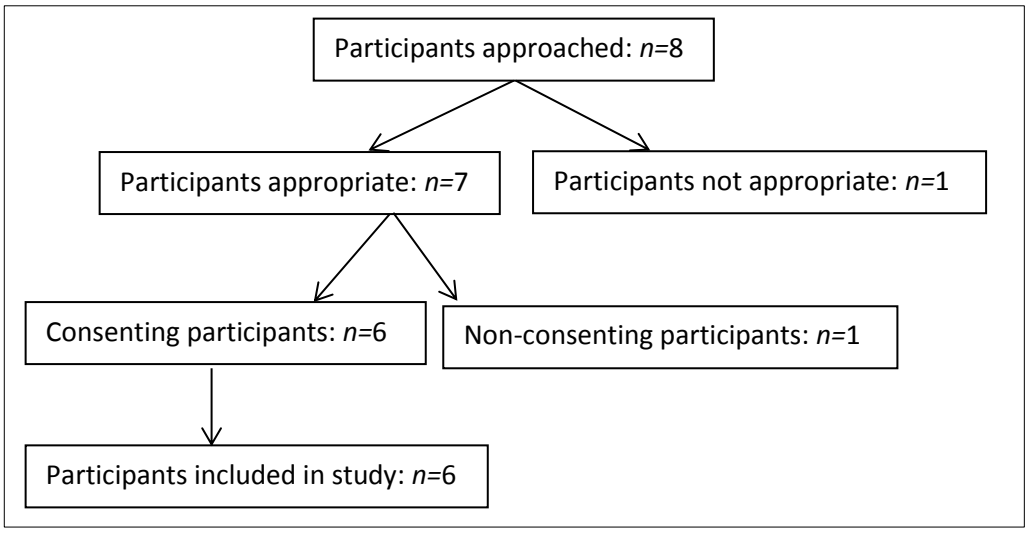

Figure 1. The flow of participants into the study

In order to minimise time pressures on participants and clinicians and to make the sample mirror the population of those seeking PTSD treatment as closely as possible, the study did not enforce a diagnostic tool on the service. Instead, PTSD diagnosis was determined by the participant's service using routine measures such as the Posttraumatic Stress Diagnostic Scale (PDS; Foa, 1995), the Beck Depression Inventory-II (BDI-II; Beck, Steer, & Brown, 1996) and/or interview techniques. Participants were included in the study if they experienced intrusive images and were willing to undergo ImRs as part of their standard treatment. Participants were excluded if they had psychotic disorders, organic brain disease, current substance abuse, or if they required an interpreter.

The participants formed a highly heterogeneous group. Heterogeneity in SCEDs has been recommended as a way to demonstrate whether effects of an intervention apply across several clients who differ in various subject and demographic characteristics (Kazdin, 1981). Participants came from different ethnic backgrounds including Asian or Asian British (*n*= 3) White or White British (*n*= 2) and Black African (*n*=1). Mean age was 43 (SD=18, range=20-65 years). In addition to PTSD, the following co-morbid diagnoses were identified; depression (*n*=3), depersonalisation disorder (*n*=1), anger (*n*=1) and complicated grief (*n*=1). Of the six participants, only one had experienced a one-off trauma, while the remaining five had experienced multiple traumatic events. Participants were not compensated for taking part in the study. Demographic information has been altered here to preserve participant anonymity.

Setting and treatment. Phase 2 sessions took place in one outpatient mental health service and one inpatient mental health service in London. Both services saw people with a primary diagnosis of PTSD. Four clinicians took part in the study. All were trained in ImRs and received regular supervision. Three clinicians worked in the outpatient service and one in the

inpatient service. Individuals seen in the outpatient service were offered longer-term therapy and could be seen for years. Those seen by the inpatient service received up to 16 weeks' of treatment.

All participants were undergoing TF-CBT. No modifications were made to their usual care. Part of all participants' care involved at least one session of ImRs. ImRs was defined in the same way as in Phase 1 of this study. Acceptable variations to the above method included not discussing the modification beforehand and not re-living the original image in its entirety first. All types of ImRs were accepted provided that the outcome of the original distressing image had changed. Where multiple intrusive images existed, participants chose which one they wanted to begin with. Participants' involvement in the study ended, either when their ImRs sessions finished, or when the recruitment deadline was reached in May 2014. All participants continued to receive treatment following the end of their involvement in the study.

Design

Phase 1. Phase 1 of the study used qualitative data from a selection of pre-existing session recordings. These recordings were used by two researchers (CS and EP) to create a coding scheme that quantified the subjective or qualitative contents of verbal utterances that could then form the basis of the method for Phase 2.

Phase 2. Phase 2 of the study used a SCED approach to apply the Phase 1 coding scheme to participants' ImRs treatment sessions. Where possible, an ABA design with three-week baseline and one-week follow-up was used to evaluate changes in image-related distress over the course of ImRs. An AB design was used when follow-up scores were not obtainable. Replication across six participants with different trauma histories was used to

enhance the generalisability of findings. Following the baseline period, ImRs was delivered approximately weekly, with each treatment sessions lasting 60-90 minutes. Following ImRs, participants continued to receive routine trauma-focused therapy from their clinician.

Measures

Phase 1. No measures were required for Phase 1 of the study.

Phase 2. The "core" of SCED is repeated measurement of participant variables over time (Hayes, 1981). The present study administered three measures, described below. To associate change with ImRs, rather than to maturation effects, testing effects or regression to the mean (Cook & Campbell, 1979), it was necessary to demonstrate symptom stability before the introduction of ImRs (Turpin, 2001). To investigate baseline stability, measures were repeated on three occasions, weekly, before starting ImRs. For some participants however, ImRs was not pre-planned. Therefore, it was not possible to obtain baseline measures. Instead, measures were administered immediately before the first ImRs session. For all participants, measures were taken immediately before each ImRs session and where possible, one week following the final ImRs session.

Patient Health Questionnaire-9 (PHQ-9; Kroenke, Spitzer, & Williams, 2001). The PHQ-9 (Appendix 8.) was used to monitor depressive symptoms. The PHQ-9 is a brief, self-report questionnaire that screens for DSM-IV depression symptoms (Löwe, Unützer, Callahan, Perkins, & Kroenke, 2004). The PHQ-9 has superior criterion validity as a diagnostic measure compared with the Hospital Anxiety and Depression Scale and the WHO (five) Well Being Index (Löwe, Spitzer, et al., 2004) and gives realistic estimates of base rates for depressive disorders in clinical trials (Rief, Nanke, Klaiberg, & Braehler, 2004). The PHQ-9 has

excellent internal reliability (Cronbach's α of 0.89) and test-retest reliability (Kroenke et al., 2001). A decrease of five points or more has been suggested as indicative of clinically significant change (Löwe, Unützer, et al., 2004).

Impact of Event scale (IES; Horowitz, Wilner, & Alvarez, 1979). The IES (Appendix 9.) contains 15 questions that monitor distress associated with traumatic events (Horowitz et al., 1979). The IES consists of two subscales. The Intrusion subscale measures memory intrusiveness and loss of voluntary control over the regulation of thoughts. The Avoidance subscale measures whether memories are consciously suppressed. Each of the 15 IES items are scored in relation to the previous week using a four point frequency scale (0 = not at all, 1 = rarely, 3 = sometimes and 5 = often). IES Intrusion scores range from 0-35, IES Avoidance scores range from 0-40 and IES Total scores range from 0-75. Although the IES is not a diagnostic tool, a clinical cut-off of 26 has been suggested as an indication of moderate-severe impact, with scores of between 30 and 60 being fairly typical for PTSD sufferers. (Hutchings & Devilly, 2014).

The IES has been found to be reliable, stable and valid as a measure of the distress associated with an event (Sundin & Horowitz, 2002). A newer version of the IES (the IES-Revised; Weiss, 2007) which includes a hyper-arousal scale exists. However, it was decided not to use the IES-R as only Intrusion and Avoidance scales are required to give a total impact score (Holmes et al., 2005). Including the extra hyper-arousal scale would have placed increased, unnecessary demands on participants.

Visual Analogue Scales (VAS; Brewin et al., 2009). The intrusiveness of images was rated using Brewin et al's (2009) self-report, visual analogue scales (VAS, Appendix 10). Participants rated their most frequent intrusion on four VAS assessing frequency, distress,

uncontrollability and interference. Although these specific VAS have not been validated, VAS are seen as one of the simplest and quickest ways to measure subjective experience (McCormack, Horne, & Sheather, 1988). They are easy to administer, are less burdensome than multi-item instruments (Cunny & Perri, 1991; de Boer et al., 2004) and can possess high reliability and validity (Ahearn, 1997). As a result, VAS were used in this study to provide information about the course and variability of intrusive images from the participant's perspective.

Procedure

Phase 1.

Sampling of items. In total, 33 ImRs session recordings from nine participants were available to develop the coding scheme. Half the recordings were analysed by Researcher 1 (CS). The remaining half were analysed by Researcher 2 (EP). All recordings were used to develop the coding scheme.

Developing the coding scheme. The procedure for developing the coding scheme follows Braun and Clarke's (2006) guidelines for thematic analysis to uncover salient themes emerging from the sessions (Aronson, 1994; Attride-Stirling, 2001). This method was chosen as it allows for the flexible investigation of patterns across a data set while simultaneously emphasising the role that the researcher plays in the emergence of those patterns (Braun & Clarke, 2006; Parker, 2004). Given concern over the use of over-prescriptive methodology at the expense of content and substance (Barbour, 2001; Holloway & Todres, 2003), the guidelines were used as a framework from which to develop the coding scheme. Adaptations and refinements to the guidelines were made where necessary. There is much overlap between this method and Chi's (1997) verbal analysis method for quantifying verbal data,

but Braun and Clarke's method places less emphasis on exact segmentation of verbal utterances. As this study is interested in participants' experiences at a particular moment in time, the analysis takes a realist approach in order to report the experiences, meanings and reality of participants.

First, the two researchers independently familiarised themselves with the data and identified meaningful units of text relevant to the research topic. This was followed by a second, more rigorous analysis of the data and production of an initial set of codes. Codes identified features of the data in their most basic form (Boyatzis, 1998). As ImRs sessions have not been investigated in depth before to our knowledge, it was deemed important to search for codes across the entire dataset. No restrictions were imposed regarding what could and could not form a potential code.

Having independently devised a list of codes, the two researchers met to organise the data into meaningful analytic themes and to assign them provisional definitions (Tuckett, 2005). To promote comprehensiveness, all relevant coded data extracts were included within the identified themes and were placed beside their corresponding data to aid understanding and interpretation (Braun & Clarke, 2006). For the purposes of this study, a theme was defined as a component of the ImRs that was evident within a single session and/or across multiple sessions. Themes were formed using both bottom-up and top-down approaches. The top-down approach involved explicitly searching for themes that had been previously identified in relevant theoretical research (e.g., Brewin et al., 2009; Hackmann, 2005; Holmes & Mathews, 2010; Rusch et al., 2000; Wheatley & Hackmann, 2011). The bottom-up approach involved identifying themes evident in the data regardless of whether they had been previously identified (Patton, 1990).

Having identified an initial set of themes, the themes were assessed for internal homogeneity and external heterogeneity (Patton, 1990). In other words, the researchers

checked that codes within the themes cohered meaningfully and that the individual themes were clearly distinguishable from one another. In doing so, some themes were discarded as there was not enough data to support them. Others were expanded as they tried to capture too many features of the data at once. The provisional themes were also shown to experts in the field and their comments incorporated into the coding scheme. Usually, this meant making a particular theme more explicit or clarifying its definition. The remaining themes were defined, ensuring that the themes linked to the original dataset and were distinct from one another. Finally, the coding scheme was re-applied to the recordings and final adjustments were made.

Phase 2. Potential participants met with their clinician for a routine appointment in their usual NHS service. At this appointment, the clinician introduced them to the aims of the study and asked if the participant would like to discuss potential involvement with the researcher. Potential participants were made aware that declining to take part would have no impact on their access to treatment. The details of those wishing to take part were passed to the lead researcher (CS), who contacted them by telephone to explain the study, or to arrange to meet the participant in person if preferred. Consenting participants signed the consent form (Appendix 11.) and their clinician was notified of their agreement to participate. Those who declined to take part having heard the full nature of the study continued their treatment as usual.

Participants were asked to complete the IES, PHQ-9 and VAS two weeks prior to starting ImRs. If the clinician decided that ImRs was indicated before baseline scores could be obtained, treatment was not delayed. Instead, the participant completed the questionnaires immediately before their first ImRs session. All participants completed the same questionnaires each week immediately before their ImRs sessions and again one week

following ImRs completion. Clinicians completed a demographic details sheet, giving information on participant age, gender, ethnicity, their treatment to date and trauma history. All data was anonymised before it left the service and was stored on an encrypted memory stick. Every ImRs treatment session was audio-recorded.

One researcher (CS) transcribed and coded all session recordings according to the coding scheme outlined in Phase 1. A second researcher (EP) coded the first of each participant's sessions to assess percent agreement. Discrepancies were discussed and alterations made accordingly. Participation in the study ended either when treatment finished, or when recruitment ended in May 2014. Participants were debriefed following study completion in June 2014 (Appendix 12).

3. Results

Analysis Plan

Descriptions of the codes present in the coding scheme are presented first. Second, Phase 2 analysis is presented. The application of the coding scheme to each participant individually is discussed, before general conclusions across participants are made.

The Coding Scheme

The full coding scheme is presented in Appendix 13 with the accompanying coding instructions found in Appendix 14. The over-arching themes are described below, with examples of the data used to define them.

Pre-imagery themes. Pre-imagery themes refer to aspects of the session that occur in the lead up to imagery work. "*ImRs Preparation*" captures information about how much preparation was put in place prior to ImRs. This theme describes how much discussion and

preparation takes place before the ImRs began, whether the ImRs was prepared in advance, the extent to which it prepared and any specified end goal. Some participants chose to decide in full how they wanted ImRs to play out and what goal they wanted to reach before beginning any imagery work, whereas other devised a loose plot to follow, or simply began with no clear plan or end goal. Where an end goal was discussed, it often involved helping the participant to feel safe, comforted or to assert themselves. *ImRs preparation* also captures information about how easy it was for the participant to choose a direction for the ImRs, how much therapist input was required and whether memory prompts were used. Some participants found it easy to choose a direction for the ImRs. Others could not think of any way to change the image and had to be entirely directed by the therapist. Most required some form of prompting to think of a direction of change for the image.

"*Attitude Towards ImRs*" describes participant's attitude towards the re-scripting process before re-scripting began. Specifically, this theme captures how motivated participants were to try ImRs and how much they understood the rationale. Participants varied in their attitude towards the re-scripting process. Some participants were scared of re-scripting, but understood the rationale and were willing to try. Others were sceptical that it would have any effect on their symptoms.

Whole process themes. "Whole process" themes are relevant to work with the original and re-scripted parts of the image. "*Participant's Ability to Follow ImRs"* describes how easily the participant found it to independently narrate their own ImRs from beginning to end. Some participants were not able to follow the ImRs, even with considerable therapist prompting. Others were able to lead the re-script themselves and only required prompts to help them elaborate particular scenes in more detail. Individual codes capture how much prompting was required by the therapist, the ease with which the participant could stay with

the image, whether the process followed a coherent narrative and the speed at which the image was viewed.

"*Activation of the Image"* describes the extent to which participants were able to bring to mind and describe the numerous components of the image throughout the whole of the ImRs process. *Activation of the Image* codes capture information about the verbal tenses used to describe the image and the viewpoint from which the image was witnessed. Participants tended to use a mixture of first and third person, field and observer perspectives and past and present tenses. *Activation of the image* codes also capture information about the specific senses engaged in the image and the reported vividness and intensity of these senses. All participants could bring visual images to mind and often described additional senses such as sound and touch. Smell and taste were rarely present. All were described as vivid at some point during the ImRs process, although it was common for the vividness of the image to fluctuate throughout the process.

Re-living themes. Although traditional ImRs manuals recommend re-living the memory in full prior to re-scripting, therapists in these recordings often asked participants to briefly describe the original image or event without encouraging them to access the details of the image. However, while full re-living was rare, all ImRs included some of the original memory in the re-scripting process. Re-living themes refer to work with the original memory, regardless of whether it was re-lived in full or not.

"*Activation of Original Internal Processes"* captures the presence of emotions, cognitions and physical sensations that were associated with the original image or traumatic event and were present during any part of the re-scripting session. All aspects of re-living were associated with the presence of emotions, physiological sensations and cognitions that were associated with the original image. Emotions often included shame, guilt, fear,

embarrassment and loneliness. Physiological sensations included feeling heavy, shaking and having difficulty breathing. Cognitions included “I’m going to die”, “I’m so alone” and “I’m an awful person”, among others. *Activation of original internal processes* also summarises the intensity of emotions, physiological sensations and cognitions varied between individuals. Some individuals experienced accessing original internal processes intensely, whereas others reported how they had felt at the time, without necessarily feeling the same way in the therapy room.

Re-scripting themes. Re-scripting themes capture information from the point at which change is introduced in the image. By definition, all re-scripts involved a departure from the original image. However, the extent to which this was true varied. The theme “*Departure from the Original Image”* captures how much of the old image was present in the re-script. *Departure from the original image* also examines how far through the original intrusive image the change is introduced and whether there is overlap between the setting of the original and re-scripted image. Most participants introduced change at the point at the most traumatic point of the old image. However, some included very little of the original image in their re-script. Some re-scripts occurred in the exact setting as the original image, others involved leaving the scene and some took place in a different location entirely.

Often, participants chose to bring new people into the image. “*Others in the Re-script”* explores which individuals are brought into the re-script. Common figures included family, friends, the therapist and the participant as their current-self. More often than not, participants did not feel able to bring about a change in the re-script as their past-self. *Others in the re-script* outlines how these individuals help to bring about change and their emotional response to the events occurring within the image.

"*Believability of the Re-script"* captures whether or not the change could actually have happened given the constraints of time and space, whether the participant feels the re-script is believable and whether the re-script is related to a real world event. Often, re-scripts were not physically possible given the constraints of space and time. Time travel, speaking to dead relatives and being visited by an angel are examples of this. Regardless of "real world" believability, participants often reported finding their re-scripts believable.

All re-scripts were associated with the emergence of emotions, physiological sensations and cognitions. The final re-scripting theme, "*Activation of Internal Processes During Re-scripting"* describes which emotions, physiological sensations and cognitions were present during the re-script. Emotions often included sadness, anger, relief and comfort. Physiological sensations included feeling calm, relaxed and tired. Cognitions included "It's not my fault, "I'm not alone" and "I'm safe now". *Activation of internal process during re-scripting* also details the intensity of internal processes and whether there has been a shift from those associated with the original intrusive image.

Outcome. The final themes relate to the outcome of the re-scripting process. "*Definition of the Outcome"* captures information about the final change that is brought about in the image through re-scripting and where applicable, compares it to the intended outcome that was outlined in the preparation stage. The theme also outlines whether the final outcome allowed a previously unmet need to be met. There were a number of different possible outcomes for the re-scripts, often involving the individual being protected in some way. All outcomes involved working towards helping participants having their previously unmet needs met.

All participants derived meaning from the re-script. "*Attitude Towards the Outcome"* defines the final message that participants took from the re-scripting process. Often, this

was reflected in the cognitions elicited during the re-script, although for some, additional meanings emerged. For example, an original cognition of "I've let her down" changed to "she would be proud" during the re-script and "she would want me to move on" following the re-script. For others, the meanings associated with the original image had not changed, but were less easily triggered. *Attitude towards the outcome* also describes how individuals felt about the outcome. Participants often reported feeling positively towards the new image and expressed surprise or shock that they were able to bring about change.

Reliability of Coding

The first session from each Phase 2 participant was coded by the first researcher (CS) and the second researcher (EP) to investigate percent agreement. This ranged from 76% to 87%, with a mean percent agreement of 82%. Researchers tended to agree on codes regarding the content of ImRs, for example which senses, emotions and cognitions were present. However, they disagreed on more subjective codes such as internal process intensity and how easy participants found ImRs. Further modifications were made to the scoring manual to enhance clarity. This manual was then used by the lead researcher as the basis for scoring the remaining session recordings.

Phase 2 Analysis Plan

This section of the analysis begins with an overview of the participant attendance. Second, individual analysis of each participant will be presented. Finally, an overview of ImRs factors across participants and how these might relate to outcome will be provided.

Participant Attendance

The coding scheme was applied to 20 sessions collected from six participants. Each participant had between one and eight ImRs session recordings. Multiple baseline scores were obtained for four participants. The remainder had one or two baseline scores only. Only two participants had follow-up measures available. The remaining four participants were still attending ImRs sessions at the end of the study.

A summary of participant attendance can be seen in Figure 2. In total, 31 sessions were scheduled and 25 sessions were attended. Only P1 did not attend scheduled sessions, missing six of the nine appointments offered to him. Of the remaining 25 sessions that were attended, 20 involved ImRs. Reasons for not completing ImRs in session including feeling too distressed to use imagery work, needing support with other life events or attending late and so not having the time available.

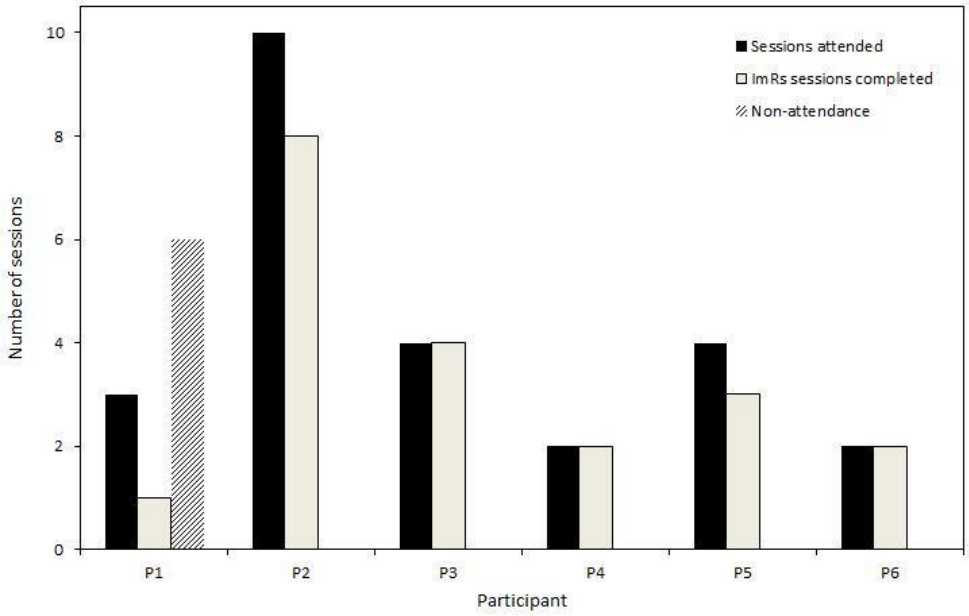

Figure 2. Number of sessions attended by each participant

Individual Analysis

This section of the results describes each participant individually. For each participant, background information is presented first, followed by graphical analysis (Barlow, Nock & Hersen, 2009) to investigate trends in the data and changes in the value of the central location between phases. The results of the graphical analysis are compared to the session-by-session codes identified by the coding scheme, to investigate whether presence of particular codes could be associated with a given participant's scores. Having investigated each participant individually, overall conclusions regarding the importance of each code across participants will be drawn.

Although some authors (e.g., Houle, 2009; Kazdin, 2007; Shadish, 2014) have advocated statistical analysis in SCEDs, this was not deemed appropriate here. Each participant had reached a different stage of treatment by the end of the study and only one participant had completed ImRs. It would have been inappropriate to consider the participants as a cohort and assume that their scores were comparable. In doing so, true effects in one participant may be masked by the fact that some participants were early on in therapy. Alternatively, the presence of a statistical effect may reflect a particular stage of therapy, rather than an outcome of a complete package of ImRs.

Presenting the graphical analysis. Outcome data for each participant is presented in Appendix 15 - Appendix 40. The baseline phase refers to the sessions occurring before ImRs. The intervention phase was defined as the time between the first and last ImRs session. The follow-up phase was any measure taken after the final ImRs session. Vertical lines separate each phase. Baselines are considered stable when there was 5% or less variability across all baseline measures. Central location is represented using a horizontal dashed line. The median is presented as the value of the central location when there are fewer than 5 data

points available for a given phase. The broadened median (BMED) is used in all other instances. Trend in central location is represented using a dotted line.

Participant 1. P1 was a 20 year old, single, Bangladeshi man. His sessions were conducted in English, although this was not his first language. P1 was currently seeking asylum in the UK. He was unemployed and had spent a limited number of years in education. He lived in shared accommodation. P1 was referred to the outpatient service by a community mental health team (CMHT) one year previously. He had experienced repeat traumas throughout childhood, including physical abuse, neglect, trafficking and domestic servitude.

At his initial assessment with the service, P1 scored 67 on the PDS, indicating severe symptoms of PTSD, and 37 on the BDI-II, indicating severe depression. At the time of the study, he presented with current suicidal ideation and had co-morbid depression. He was not taking medication and had received no previous psychological therapy for PTSD. He had been in treatment at the current service for six months. During this time, he had been offered 14 sessions of TF-CBT and had attended eight. P1 found it hard to attend sessions regularly and there were gaps of up to six weeks between sessions. This was for a number of reasons including difficulty finding the money to pay for transport to attend sessions and feeling highly anxious about an upcoming decision regarding his immigration status.

P1's intrusive images related to an event that happened approximately eleven years prior when he was physically assaulted by his captor. His intrusive images were of times that he was beaten for not carrying out chores "properly". He received one ImRs session related to this image. Although he returned for sessions following this ImRs session, he either attended late so that ImRs was not possible in the time available, or did not want to work on his images, preferring to prioritise his asylum application.

Graphical analysis. A summary of P1's scores can be seen in Table 1. Although P1 completed baseline measures on three occasions, there was a six week gap between the second and third baseline measure (Measures 2 and 3). Only VAS Distress measures remained stable across the baseline phase. As P1 only attended one ImRs session, no scores are available for the intervention phase. P1 returned two and three weeks after his ImRs session to complete follow-up measures. The following results must be interpreted with caution, given the limited number of measures available.

Table 1.

Central location (and range) at baseline and follow-up for P1

	Baseline	Follow-up
PHQ-9	15 (15-17)	14 (12-16)
IES Intrusions	25 (21-25)	20 (19-21)
IES Avoidance	27 (27-30)	23 (18-28)
IES Total	52 (48-55)	43 (39-47)
VAS Frequency	60 (50-70)	50
VAS Interference	65 (60-70)	50
VAS Uncontrollability	65 (60-70)	55 (50-60)
VAS Distress	60	50

Did ImRs impact on PHQ-9 scores? Visual inspection of PHQ-9 data is presented in Appendix 15. P1's PHQ-9 scores increased over the baseline phase. Although there was variability in the data, scores remained in the "moderate" range throughout baseline. There was a sharp drop in scores following the ImRs session. However, this improvement had reversed by the end of the follow-up phase, indicating little long-term improvement. P1's PHQ-9 scores remained in the "moderate" range for depression at the end of the study.

Did ImRs impact on IES scores? Graphical representation of IES scores is presented in Appendix 16 and Appendix 17. There was a slight increase in IES Total scores over the baseline phase, although there was variability in the data. IES Total scores decreased following the ImRs session and continued to do so over the follow-up phase. Despite this decrease in scores, IES Total scores remained above the recommended cut-off for PTSD at the end of the study.

To understand change in IES Total scores more fully, each subscale must be considered individually. With limited data points and delays between these points, it is unclear whether changes in scores represent natural variation, the effects of ImRs or the impact of external events. Nevertheless, visual inspection of IES Intrusion scores indicates that while there was no trend in the data across the baseline phase, scores were highly variable. Although scores decreased following the ImRs session and the value of the central location was lower during the follow-up phase than the baseline phase, IES Intrusion scores began to increase over the follow-up phase.

IES Avoidance scores increased over the course of the baseline, although scores were variable. Avoidance in the follow-up phase was lower than in the baseline phase, as indicated by the value of the central location. This was followed by a large decrease in scores over the follow-up phase, implying that avoidance continued to decline following ImRs. However, with only two data points in the follow-up phase, it is difficult to determine whether this decrease was steady, or due to variability in the data.

Did ImRs impact on VAS scores? Graphical analysis of VAS scores can be found in Appendix 18 and Appendix 19. Visual inspection of VAS Frequency data suggests P1's intrusive image became more frequent over the course of ImRs, although there was variability in the data. Following ImRs, P1's frequency ratings decreased, then remained

stable. VAS Interference decreased over the baseline phase, remained stable across the follow-up phase and was lower during the follow-up phase than the baseline phase. VAS Uncontrollability decreased over the baseline phase. This negative trend continued across the follow-up phase. Finally, VAS Distress scores remained constant during the baseline phase, before decreasing following ImRs and then remaining stable.

Graphical analysis summary. Following a single ImRs session, P1 experienced no change in PHQ-9 scores. His IES Total score decreased, but remained above the clinical cut-off for PTSD. Changes in P1's IES Intrusion and Avoidance scores indicate that his image became less intrusive and he avoided reminders of the event less following ImRs. Changes in his VAS scores reveal that his image also became less frequent, interfering, uncontrollable and distressing.

Session content. It is difficult to make conclusive statements regarding the efficacy of a single ImRs session for P1 given the lack of measures, the delay between the session and outcome measure completion and the potential impact of external events including P1's asylum process on his scores. However, as P1's scores decreased on every measure following one ImRs session, it is certainly worth exploring the session content in more detail. P1's only ImRs session was prepared prior to beginning ImRs. No memory prompts were used during the session. The session involved him wanting to change the ending of his intrusive image by seeking revenge on his captor and re-gaining control by "fighting back" (*ImRs preparation)*. P1 appeared unsure about the purpose of ImRs, but was nevertheless motivated to try (*Attitude towards the re-script)*. During the re-living aspect of the session, P1 was able to access emotions, physiological sensations and cognitions present at the time of the original event (*Activation of original internal processes)*. Specifically, he reported feeling intense

feelings of fear, anger and helplessness during this part of the session. He identified his heart beating quickly, reported wanting to die and felt worthless.

P1 paused the image during the worst moment of the assault and ended the image by leaving the scene entirely *(Departure from the original image).* He decided to bring his adult-self, the therapist and two relatives into the image. All helped to bring about change, although it was his adult-self who was ultimately responsible (*Others in the image)*. Initially, P1 explained that although the re-script felt "good", it did not feel "real". As a result, further change was introduced, which P1 described as feeling very real (*Believability).* P1 was able to access new emotions, physiological sensations and cognitions *(Activation of internal processes during the re-script)*. He reported a shift from fear and anger to happiness. He described this feeling as very intense, saying he felt it in his "whole body". This shift in emotion was associated with a shift in cognitions. During the re-script, P1 no longer felt worthless and helpless, but instead identified feeling worth something, that he did something good and that he was going to be rescued *(Attitude towards the outcome)*.

Activation of the image codes revealed that P1's image was highly activated. Specifically, the image was viewed mostly from a field perspective and narrated in the first person, present tense At times however, he reported seeing the image as if he was "getting beaten down there but… standing here". The image was mostly viewed in real-time, although the therapist occasionally had to prompt P1 to slow down and to view the image as if watching in slow motion, to ensure that P1 included as many details as possible in the image. For the majority of the time, the image was described in the first person. All five senses bar taste were included and P1 reported the image to be very vivid. With prompts from the therapist, P1 was able to stay with the image throughout and formed a coherent narrative to accompany the image (*Client ability to stay with the image).*

By the end of the session, P1 had been able to seek revenge on the perpetrator and stand up for and comfort his younger-self, which allowed P1 to meet the previously unmet need of comfort and protection in the image (*Definition of the outcome*). The final message taken from the image and the associated emotion were positive, in that P1 felt cared for. P1 reported surprise that he had been able to defeat the perpetrator in the image, saying he "… thought that no one's going to come… and beat him up, he thought that no one can touch him" (*Attitude towards the outcome*).

Summary. P1 attended a single ImRs session. In this session he was motivated and able to create a re-script that was vivid, involved accessing original and new thoughts and feelings and was associated with a change in the way that P1 viewed the original image and associated event. P1's scores improved on all measures with the exception of the PHQ-9 following this single ImRs session. However, with a lack of stable baseline data, a three week gap between intervention and the first available follow-up point and limited follow-up data, it is difficult to assess whether these changes were a direct result of the ImRs session, a consequence of external circumstances such as a change in his asylum application, or due to natural fluctuation over time.

Participant 2. P2 was a 49 year old single woman from America. Her first language was English. She was employed and had spent approximately 20 years in education. She lived alone in council accommodation and had two daughters. P2 was referred to the outpatient service by a CMHT four years previously. She had experienced repeated, prolonged traumas including childhood abuse and neglect. However, she had been referred as a result of domestic violence in adulthood. At her initial assessment four years prior, P2 scored 39 on the PDS indicating severe symptoms of PTSD and 19 on the BDI-II, indicating

mild depression. She had been in treatment at the current service for three and a half years and had received 151 sessions of stabilisation, risk management and TF-CBT. At the time of the study, she presented with current suicidal ideation and depersonalisation disorder. She was not taking medication.

P2's main flashback related to an event that happened approximately 18 years prior when she was physically assaulted by her husband in front of her young daughter. There were two key intrusive images that were re-scripted in therapy. Image 1 involved the time immediately after the assault. During this image, P2 had gone to her sister's house to seek help, only to find her husband was there. Image 2 involved the assault itself. When describing these images as they happened, she struggled to put her experiences into words and began to dissociate. P2 received eight ImRs sessions over the course of ten weeks. Gaps between ImRs sessions were because P2 required support filing a complaint to an external organisation, which caused her distress. She completed the measures during these sessions and they have been included in the analysis.

Graphical analysis. An overview of P2's scores is presented in Table 2. Baseline measures were taken on three occasions on a weekly basis prior to starting treatment. Only VAS Distress remained stable across the baseline. Measures for Image 1 and Image 2 are presented separately. At the time of writing, P2 had not completed her ImRs treatment. Therefore, follow-up data are not available.

Table 2.

Central location (and range) at baseline and follow-up for P2

	Baseline	Intervention- Image 1	Intervention- Image 2
PHQ-9	17 (16-18)	17.5 (14-24)	15.7 (13-19)
IES Intrusions	15 (12-15)	7.5 (7-9)	13.3 (11-21)
IES Avoidance	28 (26-28)	19.5 (18-22)	22.7 (18-30)
IES Total	41 (40-45)	28 (25-29)	37.3 (31-51)
VAS Frequency	40 (30-40)	20 (10-30)	35 (20-50)
VAS Interference	20 (20-45)	15 (10-20)	38.3 (20-60)
VAS Uncontrollability	20 (20-30)	15 (10-40)	36.7 (10-80)
VAS Distress	20	15 (10-40)	30 (20-60)

Did ImRs impact on PHQ-9 scores? Visual inspection of the data (Appendix 20) suggests that there was a small improvement in PHQ-9 scores over the baseline phase, although she remained "moderately depressed". During treatment for Image 1, the value of the central location increased marginally, but continued to decrease across the phase. Scores became highly variable towards the end of this intervention phase. This variability can be explained by an outlier (Measurement 6). This measure is elevated as P2 experienced a stressful life event in the week preceding this measurement, which seemed to skew the data and limit the associated negative trend. Removal of this data point would strongly suggest that P2 became less depressed over the course of ImRs of Image 1. Aside from Measurement 6, which fell in the "severely depressed" range, P2's scores remained in the "moderately depressed" range throughout this phase.

Visual inspection of Image 2 shows a similar pattern to that of Image 1. P2's PHQ-9 scores continued to decrease over the course of ImRs. However, there is a large amount of variability, which increases over treatment. This variability can be potentially be explained by

Measurement 10, which was elevated in comparison to the remaining scores. Like Measurement 6, Measurement 10 was associated with a stressful life-event. Although P2 felt less depressed during treatment for Image 2, than either Image 1 or baseline phases, as indicated by changes in the value of central tendency, her scores remained in the "moderate" range for depression.

Did ImRs impact on IES scores? Graphical summaries of all IES data can be seen in Appendix 21 and Appendix 22. IES Total scores decreased slightly over the course of the baseline phase. However, variability in the data makes the exact nature of the trend unclear. P2's IES Total scores remained well above the recommended cut-off throughout the baseline phase. During the treatment of Image 1, scores decreased, with no overall trend. Again, there was variability in the data due to a decrease in score at Measurement 6. P2's IES Total scores fell below the recommended cut-off for PTSD throughout the Image 1 phase. Following the first ImRs session for Image 2, there was a marked increase in IES Total score. This was followed by an overall decline in scores. However, there was a significant degree of variability during this phase, perhaps due to an elevated score at Measurement 10. By the end of the study, P2's IES Total score remained above the recommended cut-off for PTSD.

To understand IES Total variability, it is necessary to consider each subscale separately. IES Intrusion decreased slightly during the baseline phase, although variability increased making interpretation difficult. Following the first ImRs session, there was a sharp drop in IES Intrusion. Scores continued to decrease throughout the course of ImRs for Image 1. However, when P2 began working on Image 2, her intrusions increased, almost back to baseline levels. During the Image 2 phase, there was a slight negative trend, but large variability in the data, again explained by a peak in scores at Measurement 10.

IES Avoidance increased over the course of the baseline phase and showed little variability. Following the first ImRs session, there was a sharp drop in IES Avoidance,

although scores increased slightly over this phase. The value of the central location was lower for this phase than the baseline phase. As with IES Intrusion, there was a marked increase in IES Avoidance scores when P2 began working on Image 2, but then began to decrease. However, there was wide variability in the data as scores fluctuated each session.

Did ImRs impact on VAS scores? Graphical summaries of VAS scores can be found in Appendix 23 and Appendix 24. Visual inspection of VAS demonstrates that scores followed a similar pattern over the course of treatment on all scales. VAS Frequency, Interference, Uncontrollability and Distress remained stable or decreased over the baseline phase, although variability was high. Following the first ImRs session for Image 1, scores on all VAS decreased and either continued to do so or remained stable across the intervention phase. However, a large degree of variability means the exact nature of data trends is unclear. Scores on all VAS increased following the first ImRs session for Image 2. Scores then declined across the intervention phase. With the exception of VAS Frequency, the value of the central location remained above baseline levels. Again, there was a high degree of variability, possibly due to a potential outlier at Measurement 10, which was associated with a stressful life event.

Graphical analysis summary. Following four ImRs sessions for her first intrusive image, P2 experienced a slight increase in PHQ-9 scores. However, the avoidance, intrusiveness, frequency, interference, distress and uncontrollability associated with Image 1 decreased. Following ImRs for Image 2, P2 experienced an increase in all scores, which then declined over the course of treatment for Image 2. However, there was a great deal of fluctuation from one week to the next.

Session content. Changes to P2's scores rarely followed a simple linear trend or demonstrated a gradual reduction in symptoms over time. In order to better understand what might be contributing to fluctuations in P2's scores, it is necessary to compare session outcomes with session content, as captured by the coding system. Image 1 and 2 phases will be discussed separately.

Image 1. Pre-imagery themes indicated that P2 was hesitant "messing around with the memories" and "trying to change the facts…" Subsequent discussion with her therapist allowed her to use ImRs as a way to "add in" her perspective and although fearful, she was willing to try ImRs. This worry about denying the ending was not present after the first ImRs session. Instead, P2 became more confident about using ImRs as sessions progressed *(Attitude towards the re-scripting process)*. All P2's re-scripts were prepared before starting imagery work *(ImRs preparation).*

P2's *Activation of original internal processes* changed over the course of sessions. Initially, P2 found it difficult to access thoughts and feelings from the time of the original event. She was able to describe how she had felt at the time, but often in a way that removed her from feeling those emotions in the room. As sessions progressed, P2 was able to connect to these internal processes more easily. Specifically, she reported feeling fear, abandonment, shame and confusion. She described thinking "I don't know what to do" and "I'm trapped" and reported the physiological sensations of pain in her head and chest. P2 struggled to stay with the ImRs process initially and had to be led by the therapist *(Ability to follow the ImRs process)*. Over the course of therapy, her ability to follow the ImRs process increased and she became more able to guide and narrate the re-script herself. In addition, she became more confident at vividly imagining the image and describing the events from a field perspective *(Activation of the image).*

P2 introduced change part way through the traumatic image (*Departure from the original image).* At first, P2 relied heavily on other people to bring about change (*Others in the re-script).* Over time, she was able to take more responsibility. In doing so, she was able to connect to new internal processes. She reported feeling good, legitimate, supported and lighter and thinking "I have people around me who care" *(Activation of internal processes during the re-script).* However, at times she found it hard to connect to these internal processes, as the changes introduced did not feel believable. At these times, P2's scores appeared to increase (e.g., Measurement 5). With subsequent changes, P2 was able to find a change that did feel believable to her and that she could connect to *(Believability)* and her scores appeared to decrease. As P2 was able to have previously unmet needs of compassion and safety met (*Definition of the outcome),* her attitude towards the image changed. She reported realising that the situation was "never going to work out", was surprised that she was able to leave the image and felt less "stuck" *(Attitude towards the outcome).*

Image 2. Pre-imagery themes indicated that P2 was intensely afraid accessing this image *(Attitude towards the re-script).* As a result, she initially spent more time discussing how she could change the image, rather than engaging with ImRs *(ImRs preparation).* As sessions progressed, P2 remained afraid of accessing the image, but became more motivated to try *(Attitude towards the re-script).* Initially, P2 found it very difficult to stay with any of the image, reporting "my brain's just gone". Over time, she became more able to both stay with the image and take responsibility for creating a coherent narration *(Ability to follow the ImRs process).* In doing so, she was able to create an image that was vivid and described from a first person, field perspective *(Activation of the image).* Interestingly, as P2 activated the original image, she began to uncover previously forgotten information which added richness to the image activation.

Activation of the original internal processes changed over the course of ImRs. Initially, P2 introduced change well before the worst part of the image *(Departure from the original image)* and reported little activation of these processes. When P2 introduced change at the worst moment of the traumatic image she experienced intense feelings of anxiety, confusion, pain and worry and thoughts of "I don't know what to do".

Initially, P2 relied on *Others in the image* to introduce change. As sessions progressed, she became more able to instigate change as herself in the image. In doing so, P2 was able to access new internal processes in all her ImRs sessions *(Activation of internal processes during the re-script)*. New emotions included feeling strong, powerful and supported. New cognitions included "I have the time to work out what to do", "I have people here to help me" and "he can't hurt me anymore". It was unclear whether physiological sensations were present.

Activation of the original internal processes and *Activation of internal processes during ImRs* seemed linked to *Departure from the original image* and *Believability.* When change was introduced well before the worst moment of the event and original internal processes were lacking, she reported that the change did not feel believable. When change was introduced at the worst moment of the original image, she reported finding the image more believable, was more able to connect to both old and new thoughts and feelings and her scores appeared to decrease.

The *Definition of the outcome* and P2's subsequent *Attitude towards the outcome* changed over the course of sessions. Initially, P2's re-script met the unmet need of having time and support to think through her options. As sessions progressed, the outcome shifted away from giving P2 time to think, to asserting her needs and seeking revenge on the perpetrator and she reported thinking "he can't hurt me anymore". It appears that P2's scores decreased the more that she was able to bring about changes that allowed her to feel

powerful and in control. P2 summarised the process of changing her intrusive images as a way of freeing her from a feeling of being stuck with the image. She explained that "…I felt really trapped there because I couldn't solve it… somehow it (ImRs) gave me a way out of that and because I wasn't on my own…"

Summary. Change in scores seemed most apparent for P2 when she was able to access old internal processes before introducing a change that felt believable and allowed her to connect to new thoughts and feelings. Change for P2 was least likely when she was too afraid to approach the image, when she intervened too early and could not activate original internal processes, or when activation of new internal processes was hindered as change was not believable.

Participant 3. P3 was a 63 year old married man from Japan. His first language was English. He was employed and had spent twelve years in education. He lived with his partner in their own house. He had two children, one of whom had committed suicide. P3 was referred to the outpatient service by a CMHT three years prior for support around symptoms of PTSD resulting from a single incident trauma four years prior when he found the body of his teenage daughter who had hung herself. P3 had not completed any service questionnaires at his initial assessment with the service, but his therapist queried whether P3 also experienced complicated grief.

At the time of the study, P3 presented with no risk, was not taking medication and had no previous experience of therapy. P3 had started treatment in the service two months prior and had received six sessions of psychoeducation. P3 experienced two key intrusive images. The first involved seeing his daughter's body in the Chapel of Rest. The second involved finding the body of his daughter after she had hung herself.

Overview of scores. An overview of P3's scores is presented in Table 3. Baseline measures were taken on three occasions on a weekly basis prior to starting treatment. Only VAS Frequency and Interference remained stable across the baseline. Results must be considered with this variability in mind. Given the limited number of sessions and the overlap in re-scripting content, the two images will be analysed together. At the time of writing, P3 had not completed his ImRs treatment. Therefore, follow-up data are not available. All interpretations are made in the knowledge that only three data points exist for each phase of the study.

Table 3.

Central location (and range) at baseline and follow-up for P3

	Baseline	Intervention
PHQ-9	4 (1-4)	1 (1-2)
IES Intrusions	12 (10-18)	12 (10-13)
IES Avoidance	21(16-29)	13(13-17)
IES Total	31 (28-47)	25 (23-30)
VAS Frequency	10	30 (10-30)
VAS Interference	10	0 (9-10)
VAS Uncontrollability	10 (0-80)	30
VAS Distress	20 (10-90)	30 (30-50)

Did ImRs impact on PHQ-9 scores? Visual inspection of the data (Appendix 25) shows that P3 experienced an improvement in PHQ-9 scores over the course of the baseline phase. P3 reported feeling less depressed during the intervention phase than the baseline phase, illustrated by a decrease in the value of the central tendency. His scores continued to decrease over the course of the intervention phase. However, as P3's scores were

consistently low and variable, falling in the “mild” and “minimal” range for depression throughout the study, it is difficult to judge whether decreases in scores represent a decrease in symptom severity, or natural variation in the data.

Did ImRs impact on IES scores? Graphical summaries of all IES data can be seen in Appendix 26 and Appendix 27. Visual inspection of IES Total score revealed that his scores decreased over the baseline phase. However, the presence of variability in the data makes the exact nature of the trend unclear. Scores continued to decrease over the course of the intervention phase. The value of the central location also decreased. Again, there was some variability in the data, most likely due to an elevated score at Measurement 5. By the end of the study, P3’s IES Total score had dropped to below the recommended clinical cut-off for PTSD.

Both IES Intrusion and IES Avoidance scores decreased over the baseline phase, although there was a high degree of variability at the start of the phase making interpretation difficult. The value of the IES Intrusion central location remained stable across the baseline and intervention phases. IES Intrusion decreased over the course of the intervention phase. Conversely, central location of IES Avoidance decreased during the intervention phase, and then remained stable.

Did ImRs impact on VAS scores? Graphical summaries of VAS scores can be found in Appendix 28 and Appendix 29. VAS Frequency and VAS Interference scores remained stable throughout the baseline phase, with no variability in the data. Following the introduction of ImRs, P3’s VAS Interference scores declined. However, VAS Frequency scores increased sharply following the first ImRs session, before decreasing over the course of treatment, with large variability in the data due to a marked decrease at Measurement 6.

P3's VAS Uncontrollability and Distress scores decreased over the course of the baseline period, although variability was high. Following the first ImRs session, scores on both scales increased. VAS Distress remained stable across the intervention phase. VAS Uncontrollability declined across the intervention phase. The value of the central location was higher during the intervention phase than the baseline phase on all VAS with the exception of VAS Interference.

Graphical analysis summary. Following four ImRs sessions P3 experienced a small decrease in PHQ-9 scores. He no longer reached the recommended clinical cut-off for PTSD on the IES, due to a reduction in his IES Avoidance score. He also rated VAS Interference as lower during the intervention phase than the baseline phase. However, ratings of VAS Frequency, Uncontrollability and Distress had increased.

Session content. There is no information available to help explain fluctuation in baseline scores. However, information is available for the intervention phase. Pre-imagery themes indicated that P3 was unsure about the rationale for using ImRs, but was nevertheless willing to engage with the process *(Attitude towards the re-scripting process)*. With the exception of session three, all P3's re-scripts were prepared before starting imagery work *(ImRs preparation).*

P3's *Activation of original internal processes* changed over the course of his ImRs sessions. Initially, P3 accessed intense feelings of sadness and thoughts of "I've lost her (his daughter) forever". As ImRs progressed, less time was spent accessing the original internal processes. With prompts from the therapist, P3 appeared to find it relatively easy to stay with the image and create an accompanying coherent narrative. As sessions progressed, P3 required less input from the therapist and became more able to guide ImRs himself *(Ability*

to follow the ImRs process). All of P3's ImRs sessions were described from a first person, present tense, field perspective, were reported to be vivid and were easily visualised *(Activation of the image).*

P3 chose to introduce change part way through the traumatic image. He began the image in the original setting then moved to a "better" place (*Departure from the original image).* P3 did not introduce anyone else into the image, but instead chose to introduce change as his past-self *(Others in the image)*. In doing so, he was able to apologise to his daughter for the things he had said and hear her tell him that she was alright. He was able to connect to new internal processes *(Activation of internal processes during the re-script)*. Specifically, he was able to connect to the physiological sensation of being hugged by his daughter which made him feel comforted and connected to her. He described thinking that although his daughter was dead, he had not "lost her forever", which he described as "wonderful". At times P3 found it hard to connect to these internal processes, as the changes introduced did not feel believable. With subsequent changes, P3 was able to find a change that felt more "tangible" and that he could connect to *(Believability).*

In all P3's ImRs sessions, he achieved the outcome of apologising to his daughter and receiving warmth and compassion in return (*Definition of the outcome).* In doing so, his attitude towards the image changed. He reported a shift from wishing he could speak to his daughter, to feeling as if he could speak to her. As a result he felt that things "haven't just stopped" *(Attitude towards the outcome).*

The more that P3 was able to connect to new internal processes that felt believable the more his IES Intrusion, IES Avoidance and VAS Interference scores appeared to decrease. P3 described ImRs as a way of freeing himself from being "stuck" with the image. He explained that "it be nice to… tell her that I'm sorry for what I said and let her know she's not alone… I can talk to her as if she's listening… instead of just wishing that I can". However,

his VAS Frequency, Uncontrollability and Distress scores increased. P3 reported that through the process of using ImRs, he had begun to access previously avoided memories of his daughter and thought of her more. This emergence of new memories was not captured by the coding scheme. Nevertheless, it is suggested that as P3 engaged with the ImRs process, he began to access previously avoided memories that caused him short-term distress. Unfortunately, long-term outcome measures are not available. It would be interesting to see whether scores decreased long-term, or whether his symptoms persisted.

Summary. Over the course of his sessions, P3 was able to bring to mind and stay with a vivid image that included the original intrusion and new material. In doing so, he was able to access the original internal processes and experience a shift in how he felt towards and thought about the image. It is possible that this allowed P3 to reduce the need to avoid the image, allowing him to process more of the emotional and cognitive content associated with the image. In doing so however, his images became more frequent, uncontrollable and distressing as new memories were uncovered.

Participant 4. P4 was a 50 year old single man from Uganda. His first language was English. He had spent eight years in education but was currently unemployed. He lived alone in council accommodation and had no children. P4 was referred to the outpatient service by a CMHT 15 months prior as a result of torture that he experienced during his time as a child soldier. At his initial assessment with the service, P4 had scored 39 on the PDS indicating severe symptoms of PTSD and 36 on the BDI-II, indicating severe depression. At the time of the study, he presented with current suicidal ideation. He was taking 45mg of Mirtazapine, 50mg of Quetiapine and Zopiclone as required. P4 had previous treatment from a CMHT,

before being referred to the outpatient service. He had been in treatment at the current service for eight months and had received 27 sessions of TF-CBT during this time.

P4's main flashback related to an event that happened approximately 35 years prior, during his initiation into the army as a child soldier. The image that was targeted in therapy started immediately after his initiation, where he had been forced to beat a boy to death. P4 received one ImRs sessions over the course of three weeks. Gaps between ImRs sessions were spent discussing ways in which the image could be changed, without completing any imagery work. As he still completed the measures during this session, they have been included in the analysis.

Overview of scores. An overview of P4's scores is presented in Table 4. Results must be interpreted in light of the fact that P4's baseline scores showed a variability of more than 5%. At the time of writing, P4 had not completed his ImRs treatment. Therefore, follow-up data are not available. All interpretations are made in the knowledge that minimal data points exist for each phase of the study. Trended range is not included, as only two data points are included for each phase.

Table 4.

Central location (and range) at baseline and follow-up for P4

	Baseline	Intervention
PHQ-9	14 (10-18)	11.5 (10-13)
IES Intrusions	29 (27-31)	30 (29-31)
IES Avoidance	33 (32-34)	34
IES Total	62 (59-65)	34 (63-65)
VAS Frequency	70 (60-80)	70 (60-80)
VAS Interference	65 (60-70)	70 (60-80)
VAS Uncontrollability	55 (50-60)	60 (50-70)
VAS Distress	95 (90-100)	90

Did ImRs impact on PHQ-9 scores? Visual inspection of the data (Appendix 30) shows that P4 experienced a decrease in his symptom severity during this time. There was a slight decrease in the value of the central location between the baseline and intervention phase, although scores increased over the intervention phase. P4's scores remained in the "moderate" range for depression throughout the study.

Did ImRs impact on IES scores? Graphical summaries of IES data can be seen in Appendix 31. IES Total scores increased over the baseline phase, and then decreased slightly during the intervention phase. Although there was a slight decrease in the value of the central location between the baseline and intervention phases, P4's scores remained well above the recommended clinical cut-off for PTSD throughout the study. IES Intrusion and IES Avoidance increased over the course of the baseline phase. Following a single session of ImRs, the value of the central location for both IES Intrusion and Avoidance increased

slightly. While IES Avoidance scores remained stable across the intervention phase, IES Intrusion scores began to decline.

Did ImRs impact on VAS scores? Graphical analysis of VAS scores are presented in Appendix 32. VAS Interference increased over the course of the baseline phase and decreased following the first ImRs session. However, VAS Interference increased over the intervention phase and the value of the central location was higher during the intervention phase than the baseline phase. VAS Frequency, VAS Uncontrollability and VAS Distress scores all decreased over the course of the baseline phase. Following a single session of ImRs, VAS Frequency scores increased over the intervention phase, although the value of the central location was equal over the course of baseline and intervention phases. VAS Uncontrollability scores also increased over the course of the intervention phase. Unlike VAS Frequency, the value of the central location for VAS Uncontrollability was higher during the intervention phase than the baseline phase. VAS Distress remained stable following ImRs.

Graphical analysis summary. Following a single ImRs session, P4 experienced a small decrease in his PHQ-9 scores and VAS Distress scores. All other measures remained stable or increased. P4 was due to receive additional ImRs sessions. It would be interesting to see whether his scores changed following further ImRs.

Session content. Pre-imagery themes indicated that P4 understood the rationale behind ImRs and was motivated to try *(Attitude towards the re-scripting process)*. P4 spent a great deal of his ImRs session preparing the re-script, as although he understood the rationale, he was not sure how he would be able to bring about change in the image *(ImRs preparation).* P4's *Activation of original internal processes* indicated that P4 felt threatened, confused and worried during the re-living section of ImRs. However, these emotions were

not intense and it was unclear whether any physiological sensations or cognitions associated with the original image were present during the session.

With prompts from the therapist, P4 appeared to find it relatively easy to stay with the image. However, the coherence of his narration varied. Specifically, his re-script formed a number of separate scenes. While each scene was accompanied by a coherent narrative, it was unclear how one scene led into the other *(Ability to follow the ImRs process)*. P4's ImRs session was described from a first person, present tense, field perspective. Although the re-living section was described as being vivid, the re-scripting section was harder to bring to mind *(Activation of the image).*

P4 chose to introduce change in the aftermath of his trauma. The whole of the image took place in the original setting (*Departure from the original image).* P4 introduced his current-self into the image to instigate change. In doing so, he brought messages including "the worst part is over" and "it's not your fault" *(Others in the image)*. He reported feeling confused and overwhelmed, but also "different" and "part of the group" *(Activation of internal processes during the re-script).* However, it was unclear how strongly he connected to new cognitions and he reported finding the re-script like a "dream" and hard to believe *(Believability)*. The outcome of P4's image was that he was able to make amends for past actions and re-assure and comfort his younger-self (*Definition of the outcome).* Although P4 reported feeling relieved, it was unclear whether his final attitude towards the image had changed *(Attitude towards the outcome).*

Anecdotally, P4 reported benefit from ImRs. He said he had gained a "…new kind of idea of looking at things from a different angle… from how I would have liked them to be... And there was the feeling of, kind of joy". However, P4's sessions took place around the anniversary of his trauma, which was covered by the media. Therefore, he also reported

being in regular contact with reminders of his past, which he said caused him a great deal of distress.

Summary. Over the course of a single ImRs session, P4 was able to bring to mind and stay with a vivid image that included the original intrusion and new material. In doing so, he was able to access the original internal processes and experience a degree of shift in how he felt towards and thought about the image. However, P4 found it hard to connect to the changes in the image and did not find them believable. In addition, his ImRs sessions took place around the anniversary of his trauma. It is unclear therefore whether lack of improvement in his scores were because of difficulties with ImRs, a lack of ImRs sessions or because of external events.

Participant 5. P5 was a 43 year old single woman from Italy. Her first language was Italian, but sessions were conducted in English. She was currently unemployed, but had spent over 20 years in education. She lived alone in rented accommodation and had no children. P5 was referred to the outpatient service by a psychologist over four years prior as a result of an eight year period of domestic abuse, starting when she was in her early thirties. At her initial assessment with the service, P5 had scored 50 on the PDS indicating severe symptoms of PTSD and 31 on the BDI-II, indicating severe depression. At the time of the study, she presented with current suicidal ideation and was taking 25mg of Citalopram, 45mg of Mirtazapine and Diazepam as required. P5 had received EMDR nine years prior and had been in treatment at the current service for over three years. During this time, she had received 118 sessions of stabilisation and TF-CBT.

P5's main flashback related to an event that happened approximately five years prior when she was physically assaulted by her husband. P5 received three ImRs sessions

over the course of four weeks. There was a two week gap between the second and third ImRs session as P5 felt she was too symptomatic to use ImRs. As she still completed the measures during these sessions, they have been included in the analysis.

Overview of scores. An overview of P5's scores is presented in Table 5. It was not possible to obtain multiple baseline measures for P5 as this would have meant delaying treatment, therefore, a stable baseline cannot be assumed. At the time of writing, P5 had not completed her ImRs treatment. All interpretations are made in the knowledge that minimal data points exist for each phase of the study.

Table 5.

Central location (and range) at baseline and follow-up for P5

	Baseline	Intervention
PHQ-9	24	25
IES Intrusions	33	31 (31-33)
IES Avoidance	38	36 (33-38)
IES Total	71	64 (64-67)
VAS Frequency	30	50
VAS Interference	95	95 (95-100)
VAS Uncontrollability	90	95 (90-95)
VAS Distress	100	95 (90-95)

Did ImRs impact on PHQ-9 scores? Visual inspection of the data (Appendix 33) revealed a one-point increase in the value of the central location between the baseline and intervention phase. Scores remained stable during the intervention phase. Her scores remained in the "severe" range for depression throughout the study.

Did ImRs impact on IES scores? Graphical summaries of all IES data can be seen in Appendix 34 and Appendix 35. Visual inspection of IES Total score revealed a slight decrease in the value of the central location between the baseline and intervention phase. During the intervention phase, scores increased and there was increasing variability in the data. Her scores remained well above the recommended clinical cut-off for PTSD throughout the course of the study. IES intrusion scores decreased slightly between the baseline and intervention phase when considering the value of the central location. During the intervention phase, no trend in the data was present. However, there was variability due to an increase in scores at Measurement 3. IES Avoidance scores were lower during the intervention phase than the baseline phase as demonstrated by a drop in the value of the central location, although scores increased over the course of the intervention phase and variability was present.

Did ImRs impact on VAS scores? Graphical summaries of VAS scores can be found in Appendix 36 and Appendix 37. Visual inspection of VAS Frequency data reveals that the value of the central location was higher during the intervention phase than the baseline phase. Scores in the intervention phase increased following the first ImRs session and then remained stable, with no variability in the data. VAS Interference scores remained stable across the baseline and intervention phases. VAS Uncontrollability scores increased marginally following the first ImRs session then remained stable. VAS Distress scores decreased slightly between the baseline and intervention phase, then remained stable over the course of the phase with a small degree of variability.

Graphical analysis summary. Over the course of three ImRs sessions, P5 experienced little, if any change in her scores. PHQ-9, IES and VAS Distress scores decreased marginally

while VAS Uncontrollability and Interference increased marginally following the introduction of ImRs. VAS Frequency increased. Overall therefore, it is assumed that ImRs had no impact on the symptoms associated with P5's traumatic image.

Session content. P5 had three ImRs sessions over the course of the study. As session recordings started at the point where the re-scripting process began, it is unclear how much preparation took place prior to ImRs *(ImRs preparation).* P5 did not want to change the ending of her image, as she felt this was tantamount to denying the original events. Instead, she re-lived the original intrusive image, introduced change and then continued to re-live the original image. It was unclear how she felt towards this method *(Attitude towards the re-script process).*

P5 found it easy to bring to mind a detailed image of the original traumatic event and subsequent re-script, described from a first person, field perspective *(Activation of the image).* In all sessions, the *Activation of original internal processes* included feelings of degradation, terror and pain and thoughts of "I want to get away" and "I wish I was dead". In all sessions, *Activation of original internal processes* was so intense that she became too distressed and was unable to stay with the image. Her re-script tended to jump from old to new image and vice versa without coherent narratives linking the two images *(Ability to follow ImRs).*

P5 chose to introduce change part way through her image, before resuming with the original traumatic image *(Departure from the original image).* In doing so, she brought in a "samurai woman" to assault her husband and "ice bears" to comfort her. Both these characters brought with them messages such as "it's not your fault" and "it will be over eventually" *(Others in the image).* P5 reported feeling "good" when these characters were brought in and experienced a decline in her feelings of degradation. Overall however, she

did not experience a change in how she felt and thought in the image, explaining that "change seems very far away" *(Activation of internal processes during the re-script).* She did not find the change believable and quickly became re-absorbed in the original image *(Believability).*

In her first session, P5 was able to stay with the image until the end of the re-script and received comfort from the ice bears *(Definition of the outcome).* However, it was unclear whether her attitude towards the image had changed *(Attitude towards the outcome)*. In the remaining two sessions, she asked to stop ImRs before the end of the image had been reached. From looking at the available data, it seems P5 experienced little relief from her symptoms as a result of ImRs. Unfortunately, recruitment for the study ended before P5 had finished her ImRs sessions. Therefore, it is unclear whether ImRs was an effective treatment for her intrusive images long-term.

Summary. Overall, P5 experienced little benefit from ImRs. Although she was able to bring to mind and stay with a vivid image that included the original image and associated internal processes, she found introducing change difficult. When change was introduced, she experienced some relief, but then quickly became absorbed with the original image and associated internal processes once more. As a result, she became too distressed to continue with ImRs and so experienced little change in her beliefs about the event and no decrease in scores.

Participant 6. P6 was a 29 year old, single, Asian British man. His first language was English. He had completed a university degree, but was currently unemployed. He lived alone in his own accommodation, but was in an inpatient anxiety unit at the time of the study. P6 was referred to the inpatient anxiety unit by his GP three months prior as a result

of bullying and emotional abuse that he experienced about a year prior to starting treatment with the service. At his initial assessment with the service, P6 scored 47 on the PDS indicating severe symptoms of PTSD. He presented with comorbid depression but no risk. He was taking Mirtazapine and Venlaflaxine. P6 had received CBT six months prior to starting treatment with the current service. He had been in treatment at the current service for eleven weeks and had received 33 sessions of TF-CBT and behavioural activation during this time.

P6's main flashback related to an event that happened approximately one year ago while he was being bullied at work. P6 received three ImRs sessions over the course of six weeks. Gaps between ImRs sessions were spent using other CBT techniques to help him manage his anxiety. P6 regularly completed the PHQ-9 and IES and recorded his sessions as part of treatment. He gave retrospective consent for his sessions to be used in the study. However, VAS measures were not part of his treatment, and scores for these measures are not available.

Overview of scores. An overview of P6's scores is presented in Table 6. Baseline measures were taken on three occasions on a weekly basis prior to starting treatment. IES scores fell within the acceptable 5% variability range. PHQ-9 scores did not. Given the limited number of sessions and the overlap in re-scripting content, the two images will be analysed together. At the time of writing, P6 had completed his ImRs treatment. Therefore, a single follow-up measure is presented.

Table 6.

Central location (and range) at baseline and follow-up for P6

	Baseline	Intervention	Follow-up
PHQ-9	21 (21-24)	17.7 (15-23)	22
IES Intrusions	28	27 (21-28)	32.5
IES Avoidance	24 (24-25)	23.7 (21-25)	32.5
IES Total	52 (52-53)	51.7 (42-52)	68

Did ImRs impact on PHQ-9 scores? Visual inspection of the data (Appendix 38) suggests that P6's scores decreased across the baseline phase, although scores were variable. P6's PHQ-9 score fell in the "severe" range for depression throughout the baseline phase. During the intervention phase, P6's PHQ-9 scores decreased across the intervention phase. Overall, the value of the central location was lower during the intervention phase than the baseline phase and fell in the "moderate" range for depression. However, scores were variable due to a sharp increase in scores at Measurement 10. This increase in score was maintained at follow-up.

Did ImRs impact on IES scores? Graphical summaries of IES data can be seen in Appendix 39 and Appendix 40. IES Total scores increased slightly over the baseline phase, with little variability in the data. During the intervention phase, scores decreased and the value of the central location was lower during the intervention phase than the baseline phase. Again, there was some variability in the data, most likely due to an elevated score at Measurement 10. This increase in scores was maintained at follow-up. By the end of the study, P6's IES Total score remained well above the recommended clinical cut-off for PTSD. IES Intrusion scores remained stable across the baseline phase, whereas IES Avoidance increased. Scores on both subscales decreased between baseline and intervention phases as

indicated by a decrease in the value of the central location. Scores continued to decrease throughout the intervention phase. Variability was present and explained largely by an increase in scores at Measurement 10. This increase was maintained at follow-up.

Graphical analysis summary. Over the course of three ImRs sessions, P6 experienced a decrease in all scores during the intervention phase. However, this decrease in scores was reversed at follow-up as scores increased back to baseline levels. P6's therapist explained that he had had a "bad week" at this time. However, the results imply that the benefits experienced by P6 had reversed by the end of the study.

Session content. P6's session recording began at the start of ImRs. As a result, there is no information regarding *ImRs preparation* or *Attitude towards the re-script process.* P6's *Activation of original internal processes* revealed that P6 accessed intense emotions, physiological sensations and cognitions throughout all his ImRs sessions. These included feeling panic, fear, urgency, sweaty, in pain and tired and thinking "there's no way out" *(Activation of original internal processes).*

With prompts from the therapist, P6 was able to stay with the image and create an accompanying coherent narrative. However, he often requested to stop during the re-living section of the session and needed a great deal of therapist support to stay with the image *(Ability to follow the ImRs process).* All of P6's ImRs sessions were described from a first person, present tense, field perspective, were reported to be vivid and were easily visualised *(Activation of the image).*

P6 chose to introduce change part way through the traumatic image. He began the image in the original setting, then moved to a new place where he felt "able to breathe" (*Departure from the original image).* To bring about change, P6 introduced two colleagues

into the image. In his second and third session, he also brought in a dragon. These individuals provided P6 with emotional and practical support and a means of escape *(Others in the image)*. By introducing change in this way, he connected to new internal processes. Initially, he reported feeling peaceful and able to breathe, but still felt threatened by his boss. With additional changes in subsequent sessions, he also reported feeling content, relaxed, peaceful and as though he had escaped *(Activation of internal processes during the re-script).*

At times, P6 was encouraged by his therapist to introduce a change that P6 did not find believable *(Believability)*. P6 was adamant that he did not want to do this and chose instead to find an outcome that he could connect to. In his first session, this meant leaving the office to work elsewhere with support from his colleagues. In later sessions, this meant assaulting his boss and leaving the work environment altogether *(Definition of the outcome).* In P6's first ImRs session, it was unclear whether his attitude towards the outcome had changed in any way. In later sessions, he reported feeling that his boss was insignificant and could no longer have any power or control over him *(Attitude towards the outcome).* Despite the benefits obtained from ImRs, as evidenced by a decrease in scores over the course of treatment, P6's sores increased back up to pre-treatment levels or higher at follow-up. His therapist explained that he had experienced a particularly troubling life event that week, which had raised his anxiety levels.

Summary. Over the course of his sessions, P6 was able to bring to mind and stay with a vivid image that included the original intrusion and new material. Despite needing a great deal of support to stay with the original image, he was able to access both the original internal processes and experience a shift in how he felt towards and thought about the image. Over the course of ImRs, P6 experienced a decrease in all IES scores. However, his

scores increased dramatically in his final session and again at follow-up, due to a stressful life event. Data is not available to assess whether his scores decreased again long-term, or remained elevated.

Explaining Score Fluctuation Across Participants

ImRs had a different impact on different individuals and change involved multiple processes. The effect of ImRs varied depending on external factors such as trauma anniversaries and life stressors. Findings from the coding scheme are summarised below. Given the limited number of participants and sessions, the lack of follow-up data and the wide variation in scores, results are suggested tentatively.

ImRs preparation. Participants varied in the amount that they prepared the re-script before beginning imagery work. Regardless of whether the re-script was discussed beforehand, all participants were able to bring about change in the image. ImRs preparation did not appear to have any obvious relationship with ImRs outcome.

Attitude towards the re-scripting process. Half of the participants expressed concern at changing the ending of the image for fear that it would mean denying the events of their past. Participants also felt uneasy at the thought of accessing the image. ImRs seemed less effective when the participants were reluctant to introduce change in the image, or were too fearful to engage in the ImRs process.

Ability to follow ImRs. Participants varied greatly in their ability to follow the re-scripting process. Participants tended to find it easier to stay with the image as sessions progressed. When participants were unable to stay with the image, many experienced a

worsening in scores. When participants were able to stay with the image, they seemed more likely to experience a decrease in scores. Participants also differed in the extent to which they were able to create a coherent narrative to accompany their image. Participants who found it hard to create a coherent narrative to accompany their image often had scores that remained stable, or increased. Participants who were able to follow the ImRs process throughout seemed more likely to experience a decrease in scores.

Activation of the image. All participants were able, at some point, to create images that were visualised, vivid and included multiple senses. All participants took a field-perspective, although often as their adult-self, rather than their past-self. Participants differed in the degree to which they were able to do this. The more vivid and visualised the original image, the harder it seemed for participants to stay with the image. The more vivid the re-script, the easier participants found it to stay with the image. Overall, participants who were able to create and stay connected to both the original image and re-script seemed to demonstrate more consistent decreases in scores (e.g., P1, and P6). Participants who were unable to vividly imagine either the re-script or the original image tended to have scores that remained stable, or increased (e.g. P2's early Image 2 sessions and P5).

Activation of original internal processes. All participants were able to access the emotions, physiological sensations and cognitions associated with the original intrusive image at some point during their ImRs. Participants varied in the extent to which they accessed these original internal processes. Some (e.g., P2) found they cut off from these original processes at first, but found this easier over time. Others (e.g., P5 and P6) experienced the original processes so intensely that they found it difficult to stay with the image. When participants experienced the original internal processes either so intensely that

they became highly distressed, or did not access the associated thoughts and feelings at all, it was rare that they experienced a change in scores. When participants were able to access the original thoughts and feelings in a way that felt manageable, their scores were more likely to remain stable, or decrease.

Departure from the original image. All participants included part of their original intrusive image in the ImRs session and all images began in the original setting. However, the amount of original image present varied. Participants who included the entire original image (P5) experienced no change in scores. Participants who omitted the worst moments of the image (P4 and P2's early Image 2 sessions) also experienced scores that remained stable or increased. Scores seemed most likely to decrease when the point up to the worst moment was included in the re-script (P1, P2, P3 and P6). However, some (e.g., P2) did not feel able to do this straight away and needed to build confidence by intervening before the worst moment first.

Others in the re-script. With the exception of P3, all participants introduced others into the re-script. Half of the participants (P1, P2 and P4) chose to bring their current-self into the image. Individuals in the re-script were used to protect participants, to speak on their behalf, to warn them of impending danger, to take them to safety or to assault or berate the perpetrator. Some participants (P2 and P6) needed the others in the re-script to bring about change initially, before feeling able to bring about change themselves. P5 always relied on others to instigate change. In general, those participants who were able to instigate change in the image either as their past or current-self experienced the greatest decline in symptoms. The exception was P4, whose scores remained stable despite instigating change as is current-self.

Believability. Despite none of the participants introducing change that was possible given the constraints of space and time, all participants reported that changes felt believable to them. This was a process of trial and error. At some point in the ImRs process, all participants reported that they were unable to connect to their re-script as it did not feel believable. If the re-script was not believable, participants seemed unable to connect to the image and were unlikely to experience a change in scores. The more believable the image, the more participants reported feeling differently towards the image and the more likely it was that their scores decreased.

Activation of internal processes during the re-script. All participants reported experiencing new emotions, cognitions and physiological sensations during the re-scripting process. Common emotions in the re-script included feeling good, happy, supported, safe and comforted. Common cognitions included “I’m worth something”, “I did something really good”, “I’m not asking for much”, “I don’t have to stay here”, “I have time to work out what to do” and “he can’t hurt me”. Physiological sensations were not always mentioned during the re-script. When they were present, common sensations included feeling relaxed, light and warm. However, people also reported experiencing negative internal processes including “I’m to blame”, “I can’t win”, having headaches and feeling shock, guilt, confusion and degradation. Participants who were unable to access new internal processes, or who only experienced a lessening of the original internal processes tended to show no change in scores, or experienced an increase in scores.

Definition of the outcome. With the exception of P5, all participants were able to reach an alternative outcome for their traumatic image. Outcomes could loosely be categorised as “mastery” outcomes, for example escaping the situation, assaulting or

berating the perpetrator and having the ability to act differently, or "compassion" outcomes, for example comforting the past-self. There is not enough data to ascertain whether particular ImRs outcomes relate to particular symptom changes. Nevertheless, it appears that a combination of both mastery and compassion outcomes are important. When compassion was present without mastery (e.g., P2's early sessions), participants reported feeling stuck with the image. Conversely, when mastery was present without compassion (e.g., P5), participants reported less of a change in the associated emotions and cognitions.

Attitude towards the outcome. In addition to the new thoughts and feelings that emerged during ImRs, many participants reported a fundamental shift in how they viewed the original traumatic image following ImRs. Some felt they were no longer "stuck" with the original image. Others felt they now had two separate images and could choose which one to focus on. Participants who ended the session thinking and feeling differently about their original image tended to experience the largest change in scores. Participants who did not experience a change in attitude towards the outcome reported stability or a worsening of scores.

Additional factors. Two themes emerged that were not captured by the coding scheme. For all participants, the presence of a stressful life event had the potential to impact on scores. For some, life events meant that they preferred not to use ImRs in session as they needed to discuss other matters. For others, life events re-activated the original trauma and made them too symptomatic to attempt ImRs. ImRs also allowed some participants (e.g., P2 and P3) to uncover forgotten memories of the event, which they reported finding helpful but also upsetting.

Summary. A visual summary of the results is presented in Figure 3. This figure demonstrates the themes, along with their relevant codes, that are thought to be important for improving ImRs efficacy. The results suggest that ImRs is most likely to be effective when the participant is currently in a place of safety, and not at risk of being re-traumatised. They should be willing and motivated to engage in treatment, and to approach the traumatic image. Image activation should be high so that associated internal process can be brought on-line, but not so intense that it promotes behaviours such as avoidance or dissociation. Participants should be supported to bring about change that is not simply "better", but feels believable to them. In this way, new internal processes can be introduced. Ideally, the outcome should meet a previously unmet need, and should lead to a change in attitude towards the image and the traumatic event. However, while it is suggested that these factors improve ImRs outcome, it is not guaranteed that the inclusion of these factors will guarantee symptom improvement. Likewise, absence of factors does not automatically mean that ImRs will not go some way to providing participants with symptom relief.

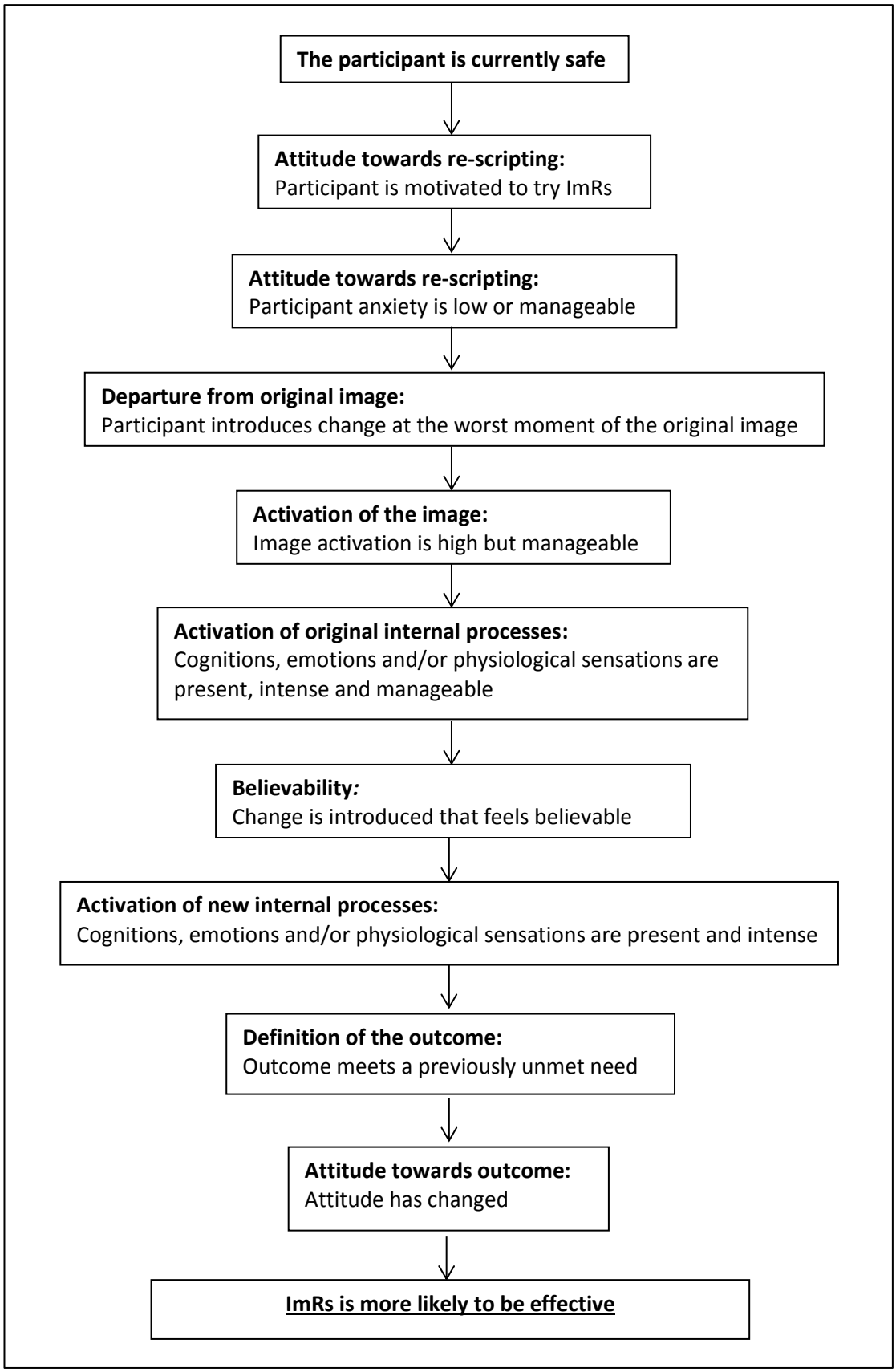

Figure 3. A diagrammatic summary of findings

4. Discussion

ImRs is an effective treatment for intrusive images in PTSD (Arntz, 2012) but little is known about the mechanisms behind ImRs. Investigation of treatment mechanisms is vital to maximise the effectiveness of interventions (Kazdin, 2007). The aim of this study was to provide a preliminary investigation of potential ImRs mechanisms and how these might influence outcome. Firstly, the study developed a method to capture and summarise the content of ImRs sessions (Phase 1 participants). Secondly, a SCED approach was employed to apply the coding scheme prospectively to ImRs sessions with Phase 2 participants to see whether certain factors might relate to ImRs outcome. The discussion will provide a summary of the main findings including how they relate to the current literature. The strengths and limitations of the study will be considered before discussing implications of the findings and suggestions for future research.

Development and Application of the Coding Scheme

Braun and Clarke's (2006) guidelines for thematic analysis were used to develop a coding scheme that captured the key features of ImRs sessions. This method was selected for its ability to identify, analyse and report patterns across a dataset in a way that provides organised and rich detail without being wedded to a particular theoretical framework. The use of thematic analysis appeared flexible enough to ground the coding scheme in existing literature, as well as being able to capture novel factors for subsequent investigation.

Themes that emerged in the retrospective analysis of Phase 1 sessions included *Activation of the image, Activation of original internal processes, Activation of internal processes during the re-script, Definition of the outcome* and *Attitude towards the outcome*, all themes that had been identified as potentially important candidates for determining ImRs outcome by previous research (Brewin et al., 2010; Hackmann, 2005; Holmes & Mathews,

2010; Rusch et al., 2000; Wheatley & Hackmann, 2011). This was unsurprising, given the use of a "top-down" approach that explicitly sought themes grounded in existing theory (Patton, 1990). Importantly however, a "bottom-up" approach, grounding the themes to the data, was also employed. This led to the emergence of new themes including *ImRs preparation, Attitude towards ImRs, Ability to follow ImRs, Departure from original image, Others in the re-script* and *Believability*. The emergence of new themes was considered vital given the lack of existing systematic studies into ImRs efficacy.

Following the identification of codes from recordings with sessions from Phase 1 participants, the coding scheme was applied to session content of Phase 2 participants. The coding scheme was easy to use, percent agreement between researchers was high and discrepancies were easily resolved through the use of the scoring manual. However, given the subjective nature of many of the factors, it is likely that coding completion was in part influenced by researcher interpretation. In addition, the ability to code often relied on the therapist asking a particular question to elicit information from the participant required to code. Future use of the coding scheme may benefit from the addition of therapist prompts, to provide more opportunity to solicit from the participant what she/he is experiencing.

Although the coding scheme allowed for quick and easy summarising of a variety of ImRs factors, its application to recordings of Phase 2 sessions revealed that additional issues such as the presence of stressful life events and the emergence of new memories may have been omitted. The thematic analysis used semantic coding, that is selection of themes based on what is explicitly said in the sessions. If latent coding, or coding that goes beyond what a participant has said, had been employed, additional codes might have been identified (Boyatzis, 1998). Additionally, many participants returned to their sessions reporting that they had gained something from the ImRs. In retrospect, codes that captured participant benefits occurring between ImRs sessions would have been useful. Therefore, while the

coding scheme is thought to provide an overview of the ImRs content, it cannot encapsulate all that participants gained from the sessions.

Treatment Acceptability

ImRs was tolerated well by Phase 2 participants. Only P1 declined further ImRs sessions, choosing instead to focus on his asylum application. Other participants (P2 and P5) requested single-session breaks from ImRs due to heightened distress, but were willing to re-engage once their distress had decreased. The remainder were willing and able to attend and engage in ImRs sessions. These findings suggest that despite chronic histories of PTSD, current risk and comorbid diagnoses, participants were willing and able to engage in ImRs.

Treatment Outcome

Each Phase 2 participant responded differently to ImRs. Only two participants experienced no change in scores over the course of the study (P4 and P5). The remaining participants experienced some relief from symptoms, although scores were variable and influenced greatly by the occurrence of stressful life events. With the exception of P3, all participants remained above the IES clinical cut-off for PTSD at the end of the study. Anecdotally, all participants with the exception of P5 reported finding ImRs beneficial. The lack of significant symptom change is not surprising given that no participant had completed treatment by this time. Furthermore, the majority of participants had experienced years of repeated, severe traumas, resulting in multiple intrusive images and strong associated negative emotions and cognitions. Complex trauma often requires years of intervention before symptom relief is experienced (Courtois, 2004). Therefore, scores should be interpreted as a snapshot of the individual's symptoms at a particular moment in time, rather than an indication of overall treatment efficacy.

Session Content and its Relationship to Treatment Outcome

To understand fluctuations in Phase 2 participants' scores it was necessary to investigate how certain factors might relate to outcome. Given the lack of stable baseline data and the limited number of sessions and participants, it was not possible to make definitive statements regarding the impact of certain codes on outcome. Nevertheless, *Attitude towards re-scripting process, Ability to follow ImRs, Activation of the image, Activation of original and new internal processes, Departure from the original image, Believability* and *Attitude towards the outcome* are all suggested as having a potential impact on ImRs efficacy. The suggestions made are strengthened by the current literature on PTSD treatments in general and ImRs more specifically. This literature is explored below.

Attitude towards the ImRs process. The first theme identified as potentially important for determining ImRs outcome was *Attitude towards the ImRs process.* Prior to beginning any kind of trauma-focused therapy, it is vital that the individual feels they are in a safe therapeutic environment where they can begin to process traumatic memories (Courtois, 2004). Images in PTSD can be triggered by corresponding emotional states such as fear (Brewin et al., 2010; Hirsch & Holmes, 2007), which can promote behaviours such as avoidance, dissociation (Silove, Tarn, Bowles, & Reid, 1991) and treatment drop-out (Tarrier et al., 1999). It is perhaps unsurprising that A*ttitude towards the ImRs process* was identified as an important factor when considering ImRs outcome, as it is difficult for a treatment to be effective if an individual does not wish to engage with it.

Activation of the image. The second identified theme was *Activation of the image*. According to Brewin's (2006) retrieval competition hypothesis, ImRs has the potential to create a competing image that is triggered by the same cues as the original intrusive image.

Brain activity for highly vivid, but imagined visualisations is similar to that produced when an object is actually seen (Gonsalves et al., 2004). The presence of multiple sensory systems has been identified as an important component for constructing autobiographical memories (Rubin, Schrauf & Greenberg, 2003) and vivid images are more likely to be recalled, regardless of image accuracy (Carroll, 1978; Gonsalves et al., 2004; Hyman & Pentland, 1996; Johnson, 2006; Tversky & Kahneman, 1973). Therefore, vividness is a strong candidate for improving image activation. Holmes and Bourne (2008) claim that individuals must be actively engaged with the image to bring about emotional change. Engagement with an image is thought to be facilitated through the use of a field perspective (Nigro & Neisser, 1983). It would be expected therefore that those images that were more "accessible", for example vivid and viewed from a field perspective, should lead to improved outcome. Indeed, in the present study, participants who could not activate their image appeared to find it difficult bring about change and were unlikely to experience symptom reduction. However, some participants were able to describe images in detail but experienced little symptom relief. According to Halligan, Clark and Ehlers (2002), data-driven processing that focuses solely on sensory properties of an event is associated with poor subsequent recall. Therefore, image activation alone may be insufficient to reduce distress.

Ability to follow ImRs. In addition to *Activation of the image,* the current study suggests that *Ability to follow the ImRs process* may be an important contributing factor. A key aspect of the *Ability to follow ImRs* code captured information about whether participants could narrate the image. The more coherent the narrative, the more likely it seemed that participants would experience symptom improvement. In support of this claim, scene coherence (Hassabis, Kumaran, Vann, & Maguire, 2007), viewpoint consistency (Black, Turner, & Bower, 1979) and causally related information (Black & Bern, 1981) have

the potential to aid recall and reduce trauma-related anxiety (Foa, Molnar, & Cashman, 1995). The current results suggest that participants who were able to create and stay with a vivid, coherent image may have found it easier to recall, thus creating a memory that could compete with the original intrusive. Participants who created vivid snapshots of the image, but were unable stay connected to the image may have found it harder to create a re-script that was organised, coherent and able to compete.

Although plausible, there are difficulties associated with this interpretation. Firstly, some participants who were able to activate an image and follow the ImRs process experienced a worsening of scores. Secondly, the discussion so far has ignored the role of emotions, which have been found to play an important role in improving memory (Berntsen, Willert, & Rubin, 2003; Rubin et al., 2003). Therefore, additional factors must be considered in order to fully explain the data.

Activation of trauma-related internal processes. The present study suggests that *Activation of original internal processes* was a potentially important factor for influencing ImRs outcome. Participants whose ImRs sessions included *Activation of original internal processes* often experienced a decrease in scores, including a decrease in IES Avoidance. Conversely, participants who expressed little *Activation of original internal processes* or whose *Departure from the image* was such that little of the original memory was included in the re-script often experienced little change in scores.

Previous research suggests that a key component of trauma-focused therapies is exposure to the original memory and associated emotions and cognitions (Foa, Keane, Friedman, & Cohen, 2009). According to the dual-representation theory, effective treatment first involves S-rep activation and consolidation into a C-rep (Brewin, 2006). In a similar fashion, the fear network model suggests that therapy should help individuals overcome

avoidance by bringing relevant trauma-related thoughts and feelings "on-line" so that they can be processed appropriately (Foa & Kozak, 1986). Activation of an alternative, vivid, coherent image is unlikely to be effective at reducing PTSD symptoms if it does not facilitate access to the internal processes associated with the original image.

The importance of exposure to trauma-related emotions in PTSD treatment has been demonstrated by Foa et al. (1995), who found that rape victims who were more emotionally engaged during therapy were more likely to show improvement over the course of exposure therapy. Exposure to thoughts and feelings present at the time of traumatic events can decrease attempts to monitor and control emotional responses (Richards & Gross, 2000) and facilitate emotional processing required for accurate S-rep contextualisation (Brewin, Dalgleish, et al., 1996). The results of the present study are in part consistent with these findings. It is possible that exposure in the context of ImRs allowed participants to "process" the trauma memory more fully so that it became less easily triggered and was not experienced as a distressing flashback (Holmes et al., 2007), indicated by decreases in IES Avoidance, and VAS Frequency and Distress scores.

Activation of original internal processes may have impacted on participants' *Ability to follow ImRs* and *Activation of the image.* Some participants (P2 and P3) were able to uncover previously avoided or forgotten memories as a result of accessing the original memory via ImRs. Although upsetting, these participants reported that these new memories provided a new perspective on the event. Foa et al. (1995) found that exposure therapy aided in trauma-memory organisation and narration, perhaps because emotionally arousing memories are better encoded and consolidated due to their distinctiveness, personal importance and emotional intensity (Cahill & McGaugh, 1998). Uncovering inconsistencies can help uncover new aspects of the traumatic event (Berntsen et al., 2003) which can aid in C-rep formation (Brewin, Dalgleish, et al., 1996) and fear network elaboration (Foa & Kozak,

1986). The present study suggests that through the activation of both a vivid image and associated internal processes and the creation of an accompanying narrative, ImRs may have aided participants' ability to process the original traumatic memory, reducing distress.

The above explanation does not apply to all Phase 2 participants' sessions. At times, some participants (e.g., P2 and P5) experienced such intense internal process activation that they became immersed in the image or cut off from the image entirely and experienced no change in scores. Both avoidance and numbing have been associated with lack treatment efficacy (Feeny & Foa, 2005). Therefore, it seems that activation of original internal processes may also impede ImRs if activation is too intense. Furthermore, explaining ImRs efficacy in terms of original internal process activation implies that exposure alone should be sufficient. A review by Craske et al. (2008) suggests that exposure to the original memory and associated emotions *per se* is not sufficient. Instead, the authors argue that how the individual learns to tolerate distressing emotions determines treatment efficacy. Although evidence is somewhat conflicting (van Minnen, Arntz, & Keijsers, 2002), exposure may be harmful to individuals experiencing non-fear based emotions such as guilt or shame (Gilbert, 2005b). For some participants, it seemed that ImRs had the potential to add something to traditional exposure-based therapies.

Activation of new internal processes. In addition to *Activation of original internal processes,* the present study suggests that ImRs was able to provide relief from intrusive images through the *Activation of internal processes in the re-script.* Unlike traditional exposure techniques, ImRs provides an approach for directly modifying the image and subsequent emotions. Holmes and Mathews (2005) have proposed ways in which imagery can impact on emotion. They state that imagery and sensory experience are strongly linked, meaning images have the potential to feel "as if" they are really happening, to "hijack"

attention and to determine future behaviour. Emotional expression has been linked to better memory (Berntsen et al., 2003) whereas emotional suppression has been linked to poorer memory (Richards & Gross, 2000; Rubin & Siegler, 2004). Through the creation of a vivid re-script, the current study suggests that participants were able to access new ways of thinking and feeling. The greater the intensity, the more easily the new image was remembered and so could compete with the original image.

However, simply introducing new, more positive internal processes does not explain why using techniques such as distraction have been found to be less effective than ImRs, even though both can involve activation of positive internal processes (Dibbets et al., 2012; Hagenaars & Arntz, 2012). In the current study, ImRs seemed to impact on scores more when *Departure from the original image* occurred near to the worst moment of the event. Intervening too early or too late seemed to reduce ImRs efficacy. It appears that there is something more than the introduction of positive internal processes that may account for ImRs outcome.

The present study suggests that there may be an optimal amount of activation of "old" and "new" internal processes that can facilitate ImRs. The "warning signals" hypothesis (Ehlers & Clark, 2000) suggest that internal processes present at the time of traumatic events come to act as predictors for imminent danger. By systematically pairing the original image with a related, more positive image and thus more positive internal processes, the original memory becomes associated with more positive emotions and becomes less distressing over time (Dibbets et al., 2012). The more the two images overlap, the harder it can be to remember distinctive information that separates them (Schacter, Norman, & Koutstaal, 1998) and so the intrusive image is more likely to trigger the positive internal processes associated with the re-script. When there is little overlap between the two images, the images are more likely to be stored as two distinct representations, making it

less likely that activation of the original image will trigger the internal processes associated with the re-script (Schacter et al., 1998) and reducing ImRs efficacy.

However, the above explanation does not fit the experience of all participants. Some participants were able to access original internal processes and introduce new internal processes, but still experienced no change in levels of distress (e.g., P4 and P2's early Image 2 sessions). Often, this was because the image lacked *Believability*. PTSD treatment advocates the need for new, corrective information to be introduced into the image in order to challenge underlying traumatic beliefs (Smucker, 2004) and introduce change (Grunert et al., 2007). ImRs requires change to be "meaningful" to the individual (Wheatley & Hackmann, 2011) so that maladaptive cognitions about the self (Birrer et al., 2007) and the trauma (Grey et al., 2001; Steil & Ehlers, 2000) can be modified. The present study suggests that participants who were able to introduce cognitions and emotions into a re-script that was believable were able to directly challenge old patterns of thinking and feeling. Participants who were unable to access new, believable emotions or cognitions may not have been able to successfully update old trauma-related information, maintaining distress. Through the creation of a believable change in the image, ImRs might create a lasting shift in the way the individual feels about themselves and the image, which in turn may increase the re-script's ability to compete with the original intrusive image.

Definition of the outcome. Interestingly, Phase 2 participants were able to access new internal processes through the introduction of a wide variety of image endings. *Definition of the outcome* could loosely be categorised as outcomes which gave participants some degree of control, for example escaping the situation or assaulting the perpetrator, and those in which the participants experienced compassion, for example comforting the past-self. There is not enough data to ascertain whether particular ImRs outcomes relate to

particular symptom changes. Nevertheless, it appears that a combination of both control and compassion outcomes were important.

The relevance of both control and compassion is perhaps unsurprising given previous findings. Self-efficacy, or "the capacity to exercise control over the nature and quality of one's life" (Bandura, 2001, p. 1) plays a key role in how individuals cope during and following traumatic events (Bandura, 1997, in Benight & Bandura, 2004). Perceived self-efficacy is reported to be a key mediator of whether traumatic incidents cause enduring distress (Benight, Ironson, & Durham, 1999). Individuals who are led to believe they can exercise some control over aversive events demonstrate less anxiety and show superior performance than those with low self-efficacy beliefs (Geer, Davison, & Gatchel, 1970) and are more likely to use coping techniques (Benight & Bandura, 2004). Imaginal mastery has been shown to increase feelings of self-efficacy (Bandura, Adams, Hardy and Howells, 1980 and Kazdin, 1978) and neutralise distress associated with imaginal re-living (Foa et al., 2009; Rothbaum & Schwartz, 2002). In the present study, it is suggested that participants who were able to exercise control over their images felt less distressed as a result.

Phase 2 participants did not have to exert control themselves in order to bring about feelings of power. All participants bar P3 and P4 used *Others in the re-script* to help them bring about change. Social support can raise an individual's perceived self-efficacy to manage environmental demands (Benight, Swift, Sanger, Smith, & Zeppelin, 1999). For those individuals who were not able to bring about change themselves (e.g., P1, P2, P5 and P6), feelings of mastery may still have been possible with the introduction of *Others in the re-script,* helping them enhance self-efficacy, which in turn can help reduce avoidance, promote memory processing and reduce distress (Germain et al., 2004; Gollwitzer et al., 2011; Smucker et al., 1995).

However, mastery alone may have been insufficient to bring about change if feelings such as fear or self-blame remain (Craske et al., 2008). According to Gilbert and Irons (2005), an important task of psychotherapy involves focusing on self-compassion. Some researchers have gone so far as to say that compassionate mind training can stimulate and strengthen neurological pathways and desensitise those related to self-blame and self-attacking (Gilbert & Procter, 2006). If so, then it is probable that participants in this study who were able to "switch on" alternative pathways and strengthen them through the repeated accessing of compassionate ImRs were able to limit activation of previous traumatic material and inhibit feelings of blame and shame, facilitating ImRs efficacy.

Attitude towards the outcome. The introduction of mastery and compassion outcomes allowed all participants with the exception of P5 to change their *Attitude towards the outcome.* Whether or not posttraumatic intrusions are experienced as distressing depends on their idiosyncratic meaning for the person (Steil & Ehlers, 2000). When intrusions are interpreted as indicating insanity, incompetence, permanent negative change or future danger, they are more likely to cause distress. If, however, intrusions are seen as a normal part of recovery and processing of the trauma, distress is less likely (Steil & Ehlers, 2000; Wells & Sembi, 2004; Witvliet, 1997).

Consistent with these findings, participants who experienced a shift in their *Attitude towards to outcome* tended to report greater relief from intrusive images than those who did not. The results suggest that ImRs allowed some participants to alter their *Attitude towards the outcome,* which can help target the toxic nature of the original image (Wheatley & Hackmann, 2011) and reduce fear responses (Arntz & Weertman, 1999; Arntz, 2012). Research on exposure and inhibitory learning supports this theory. Violation of expectancies has the potential to lead to new, secondary learning whereby original triggers no longer

predict feared outcomes and emotional distress (Craske et al., 2008). It is suggested that participants in the current study who were unable to reach an alternative ending and meaningful change were not able to inhibit activation of the original image and its associated cognitive and emotional components, preventing a change in scores. Taken together with the findings regarding *Believability* and *Definition of the outcome,* these results imply that it is not reaching a "nicer" ending that is important. Rather, it is suggested that ImRs outcome is more likely to provide relief from intrusive images when it repeatedly leads to a believable shift in harm expectancy (Hofmann, 2008) and how the individual views themselves and the traumatic event.

Summary. The present study suggests that ImRs may provide relief from intrusive images in the following ways: First, providing that the individual is willing and motivated to engage in treatment, ImRs may reduce avoidance of the original traumatic image, activate the associated S-reps or fear network and facilitate processing of the original internal processes. Second, by introducing change into the image, ImRs may allow individuals to experience a degree of control over the image and to activate new internal processes. Third, the more the internal processes are activated, the more accessible the re-script becomes, increasing the chances it will compete with the original intrusive image, reducing its frequency. Fourth, assuming the outcome is believable, ImRs allows individuals to access new internal processes and to update the meaning attributed to the original event, ultimately reducing the distress associated with the original image. However, given the number of factors and the variety of ways in which they could potentially interact with each other, this summary forms the starting point for future research, not the definitive answer to the question "How does ImRs work?"

Strengths of the Study

Design. This present study is believed to be the first to develop a systematic framework for capturing potential important ImRs factors. As a SCED, the present study is able to provide clinical depth and detail not available in more experimental approaches such as RCTs (Grey & Holmes, 2008). Unlike traditional experimental designs, which typically rely on stripped-down operational definitions of causality, the present study tracked distinct change processes for each individual (Elliott, 2002) and provides a springboard for future research.

Participant selection. The participants selected for this study were a highly heterogeneous group. Participants in the study came from Western and non-Western cultures, varied with regard to age and education and had experienced different traumatic events of different durations. Each participant demonstrated a different pattern of change, indicating that specific participant characteristics are likely to be important (Kazdin, 1981). This study acknowledges the fact that mechanisms of change may vary depending on the individual in question and emphasises the importance of considering treatment outcomes on a case by case basis.

Treatment provision. The present study acknowledged that while general ImRs principles exist, there is no single ImRs method. The study posed no limitations on treatment implementation. Kazdin (2007) has identified an “embarrassing” number of treatments in use in the psychology field and emphasises the importance of understanding mechanisms of change in order to bring about parsimony to the field. Inclusion of numerous ImRs techniques provided by a variety of therapists in this study allows for a preliminary comparison of these methods to promote further refinement of the method in the future.

It is not uncommon for individuals with PTSD to require a variety of interventions over the course of their treatment (Courtois, 2004). As a result, no limitations were placed on participants' experiences of treatment. Some participants had received over 100 sessions prior to starting ImRs. Others had had less than ten. This was important for two reasons. First, it ensured that participant need was met in a timely, appropriate and ethical manner. Secondly, the investigation of ImRs as an intervention embedded within a more general treatment package represents a more "real world" view of treatment. By including participants at different stages of their treatment journey, the external validity of the study could be maximised.

Measurement. The routine collection of a variety of validated measures also adds to the strength of the study (Morgan & Morgan, 2001). The assessment of baseline stability aided in the interpretation of data. Frequent, repeat, measurement of dependent variables gave a more in-depth understanding of the effect of ImRs on symptom severity and revealed the extent of variability in participants' scores over time (Morgan & Morgan, 2001). By combining repeated measurement with qualitative data extracted from participants' sessions, explanations of variability are enhanced and a clearer insight into individual experiences of ImRs is obtained.

Limitations and Alternative Explanations

Sampling. Phase 1 recruited participants diagnosed with depression or PTSD. Although the inclusion of participants with different diagnoses was not considered problematic given the overlap in symptoms (Friedman et al., 2011) and the similarities in intrusive images (Brewin et al., 2010), it is nevertheless possible that inclusion of the two diagnoses meant that certain codes were included unnecessarily or omitted. It is likely that

additional research comparing the content of ImRs across disorders will facilitate accurate understanding of ImRs processes.

Following Shadish and Sullivan's (2011) recommendations, Phase 2 aimed to recruit between ten and 15 participants. The final recruitment figures fell short of this recommendation, meaning the study lacks the power to make definitive interpretations. For ethical reasons, it was not possible to include a control group. Therefore, it is unclear to what extent changes in participants' scores reflect the influence of ImRs, the natural course of the disorder or nonspecific treatment effects.

Difficulty recruiting was due to a number of reasons. First, despite the recent rise in popularity, ImRs does not appear to be used routinely in PTSD treatment. This is perhaps unsurprising given the drive in the UK to implement evidence-based treatment (NCCMH, 2005) and the current scarcity of large-scale ImRs RCTs (Arntz, 2012). Second, many individuals with PTSD experience high levels of shame regarding their traumatic experience (Lee et al., 2001) and so did not wish to have their sessions recorded. Third, although some participants consented, they did not return for treatment because of fear of having to approach their traumatic memories, or because they were experiencing a stressful life event that meant therapy was not their priority.

Given the small numbers of participants available to take part in the study, it is possible that sampling was selective. Given the difficulties in engaging clients in treatment for PTSD (Courtois, 2004), it is possible that the individuals who did agree to take part had a more trusting therapeutic relationship with their clinician. No measures of the therapeutic relationship were included in the present study. Therefore, it is unclear whether changes in scores are determined by the specific content of ImRs sessions, or by more general therapist factors. Studies with the ability to recruit over a prolonged period of time will be required to overcome the limitations associated with small sample sizes and potential selection biases.

Language barriers. It is generally considered most appropriate to conduct therapeutic work in an individual's native tongue as non-English speakers may struggle to communicate fluently outside of their own language (Costa, 2010). Although all participants in this study were able to speak English, two participants did not have English as a first language. A further two had learnt to speak English abroad. Some of these participants (P1, P3 and P4) found it hard to find the words to describe their experiences. This was particularly apparent when describing emotions where adjectives such as "good" or "bad" were used. Language was also an issue when coding tenses. Some participants switched between present and past tense mid-sentence. In these cases, use of the past tense reflected language difficulties more than an avoidance strategy. Nevertheless, it made accurate coding of the tense used and subsequent interpretation difficult. Repetition of the study with interpreters to facilitate communication may aid understanding of the personal experiences of participants.

Measurement. SCED relies heavily on repeat measurement and the presence of a stable baseline in order to attribute change to the intervention (Turpin, 2001). Only P6 presented with a stable baseline in this study, increasing the risk that interpretations are falsely attributed to the intervention, rather than to natural variation over time or to maturation effects. Despite attempts to follow participants throughout the entirety of treatment, follow-up data were limited. It is unclear whether outcomes represent treatment effect or the early stages of ImRs treatment. It is vital that future clinical studies have adequate follow-up assessments with relevant clinical outcome measures in order to determine true ImRs efficacy.

Although the PHQ-9 and IES have been well validated for use in research (Kroenke et al., 2001; Sundin & Horowitz, 2002) there is no "gold standard" measurement tool for

investigating the presence and distress associated with intrusive images. While this study used a variety of techniques in an attempt to reliably measure outcome, Brewin, Gregory, Lipton and Burgess (2010) have raised concern over the use of multiple dimensions rather than restricting the scope of the investigation but using more reliable methods. On completing the VAS, one participant stated that they would have found it easier to simply record the number of times the intrusion occurred. In addition, some participants' verbal accounts indicated that their symptoms had improved, while their questionnaire measures suggested otherwise. Until sensitive measures that are acceptable to participants and have the ability to discriminate between different dimensions of experience are properly developed and validated, it will be difficult to determine exactly when and how image intrusiveness changes.

Finally, it is important to consider how the measures were taken. All questionnaires were completed immediately before the session and some therapists chose to explicitly discuss participants' responses with them during the session. Regular questionnaire completion may have alerted therapists to particular areas of difficulty that may not have been picked up in routine treatment. Questionnaire completion may have enabled therapists to tailor treatment to the needs of the individual more so than in routine treatment. Alternatively, the fact that participants knew their questionnaire responses could be seen by their therapist may have influenced the ratings they gave, creating bias in the results.

Treatment provision. Despite the inclusion of a variety of individuals at different stages of their treatment journey, the present study cannot determine the degree to which ImRs can offer an effective and complete treatment. The present study does not offer a view as to whether the same results would have been achieved if ImRs had been the only

treatment offered, or whether ImRs is best implemented as part of a wider treatment package. It is unclear from the results whether ImRs should be implemented at the beginning of treatment, or once alternatives such as more traditional exposure-based techniques have been attempted.

Clinical Implications

Promoting client engagement. Participants did not feel able to engage in ImRs if they did not feel safe, or did not understand the rationale behind ImRs. This has important implications for considering when and how to introduce ImRs into the treatment process. Firstly, client and therapist should share a common language (Kinsler, Courtois, & Frankel, 2009) so that clients are made aware that ImRs does not equate to denial of their previous traumatic experiences. Second, ImRs should only be introduced once the client has been helped to feel safe in the therapy room (Courtois, 2004). It is likely that factors such as therapist credibility, skill, empathic understanding and affirmation of the client will encourage the client to feel motivated and willing to engage in ImRs (Lambert & Barley, 2001).

Timing of ImRs. All participants experienced an increase in scores when they experienced stressful life events. This implies that attention should be given to when to implement ImRs. That is not to say that ImRs should be avoided until no life events are present. Indeed, doing so may mean that some clients never receive therapy! However, given that PTSD can be triggered by emotional states and environmental cues that mimic the original trauma (Brewin et al., 2010; Hirsch & Holmes, 2007), it should not be surprising to therapists that their clients may have difficulty either engaging in, or benefiting from ImRs if their life outside of the therapy session includes reminders of their trauma.

Client responsibility for ImRs. ImRs relies on the client's ability to be able to bring to mind the original traumatic image and associated internal processes. However, some clients may be unable to do so as a result of "pathological denial" or a "self-protective manoeuvre" that protects the client from distress at that point in therapy (Silove et al., 1991). The current results suggest that the pace and intensity of ImRs must be adapted to suit client levels of distress (Gorman, 2001) and that expecting clients to be able to stay with the whole of the image from the first session may be both unrealistic and highly distressing. Instead, ImRs may be better thought of as a staged process, whereby the client is provided with a great deal of scaffolding in the early stages, before being encouraged to take more responsibility for ImRs over time.

Individual differences in imagery. ImRs relies on the assumption that clients can construct vivid images in their mind and report back on these images. However, some clients are better able to bring images to mind than others (D'Argembeau & Van der Linden, 2006). Some individuals with amnesia are not able to imagine new experiences at all (Hassabis et al., 2007). Before beginning ImRs therefore, it is vital that therapists determine whether their client is able to use imagery. If not, it is likely that modifications to the procedure would be required, or that ImRs would not be an appropriate choice of intervention.

Activation of internal processes. Qualitative studies of therapist beliefs about treatment for PTSD indicates that many are anxious at the thought of using exposure-based techniques (Becker, Zayfert, & Anderson, 2004). Some therapists find it difficult to implement techniques that enhance client anxiety as this conflicts with the role of the care provider (Waller, 2009). ImRs may be one way of giving both clients and therapists the confidence to use imagery techniques, in the knowledge that changes can be implemented

that can reduce client distress in the session. However, the results here imply that some exposure to the original traumatic memory is still required in order for participants to gain benefit from using ImRs. Therefore, it is vital that ImRs is not seen as a way to avoid exposure entirely, but as a way to facilitate exposure to and provide relief from traumatic material.

Reviewing ImRs outcome. No participant was able to create a re-script that targeted their symptoms at the first attempt. Instead, participants required modifications to their original image before reaching a re-script that felt believable to them. A lack of improvement may indicate a problem with the image modification, rather than the technique itself. It is suggested that ImRs should be viewed as a process of finding the right "fit" for the client. It is likely that clients will need guidance in bringing about change and should be supported in finding a change that they can connect to emotionally.

Future Research

Given the preliminary nature of the current study, it is vital that future research is conducted to begin to address the many unanswered questions associated with ImRs efficacy. Large scale studies of ImRs, investigating treatment efficacy on a group and individual basis are required. Studies should include long-term follow-ups and follow individuals from the start of their treatment. Without these interventions, it will be impossible to determine whether ImRs is a viable treatment option for all individuals with PTSD, or for a select few with specific symptoms.

Future research is also required to determine how best to implement ImRs. This is likely to be a long and complicated process requiring numerous studies and methodologies. Firstly, studies are required to compare ImRs as part of a wider treatment package, to ImRs

as a stand-alone intervention. Second, studies should directly manipulate parts of the ImRs to address the impact of characteristics such as believability, emotional intensity and vividness. Third, studies should compare how much of the original intrusive image should be included in the re-script. If ImRs is effective without having to approach the worst parts of the image, it is likely that treatment will be more acceptable to clients, potentially improving treatment uptake.

Although numerous measures of PTSD symptoms exist, no measure is designed to capture the difficulties associated with intrusive images specifically. This study highlights a need for the development of tools and measures that can record the intrusiveness of images and can be used to track change over time. Such measures must be assessed for their reliability and validity as a research and clinical tool in order to help determine the subtleties of ImRs as a potential therapeutic intervention.

Finally, further research is required to investigate the characteristics of ImRs that cannot be readily captured by a coding scheme such as the one devised here. The participants themselves are a rich source of information to help researchers determine exactly what they gain from the process of ImRs. It is likely that qualitative analysis of participants' beliefs and attitudes towards ImRs and its efficacy will provide additional insights into the potential mechanisms behind ImRs.

Conclusion

The aims of the present study were two-fold. First, the study aimed to devise a coding scheme which captured key components of ImRs sessions. Second, the study aimed to apply this coding scheme to investigate how the presence of certain factors might influence ImRs outcome over the course of treatment. The resultant coding scheme, devised using Braun and Clarke's (2006) guidelines for thematic analysis, revealed the presence of

numerous potentially important factors. Some of these had been identified by previous research, others had not.

Through the prospective application of this coding scheme to six new participants, patterns regarding the relative contributions of certain codes began to emerge. Although no definitive conclusions were made regarding which factors were important for determining outcome, the results imply that successful ImRs required participants to be motived and engaged with the ImRs process. Participants needed to be guided by their therapist to access both original and new internal processes that were believable. In doing so, participants were able to construct a new accessible image that created a change in attitude towards the original event and image.

The present study allowed for in-depth exploration of specific participants' responses to treatment. However, future research will be needed to disentangle the individual components presented here, in order to better understand the mechanisms behind ImRs and improve treatment outcomes in the future. Based on these preliminary findings, implications for current practice are suggested, with specific emphasis on client motivation and engagement, exposure to original traumatic material and the introduction of believable alternative images.

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Appendices

Appendix 1. National Research Ethics Service Ethical Approval

National Research Ethics Service

NRES Committee North West - Lancaster
HRA NRES Centre - Manchester
Barlow House
3rd Floor 4 Minshull Street Manchester
M1 3DZ

Telephone: 0161 625 7818
Facsimile: 0161 625 7299

22 May 2013

Miss Caroline Salter
Department of Clinical Psychology
Department of Psychology
Royal Holloway,
University of London
Egham TW20 0EX

Dear Miss Salter

Study title:	**What makes a good imagery rescript: Using verbal analysis to investigate the characteristics required to make a successful rescript in a clinical sample**
REC reference:	**13/NW/0432**
IRAS project ID:	**124012**

The Proportionate Review Sub-committee of the NRES Committee North West - Lancaster reviewed the above application on 22 May 2013.

We plan to publish your research summary wording for the above study on the NRES website, together with your contact details, unless you expressly withhold permission to do so. Publication will be no earlier than three months from the date of this favourable opinion letter. Should you wish to provide a substitute contact point, require further information, or wish to withhold permission to publish, please contact the Co-coordinator Mrs Carol Ebenezer, nrescommittee.northwest-lancaster@nhs.net.

Ethical opinion

The Committee commented that this is a well thought through application

On behalf of the Committee, the sub-committee gave a favourable ethical opinion of the above research on the basis described in the application form, protocol and supporting documentation, subject to the conditions specified below.

Ethical review of research sites

The favourable opinion applies to all NHS sites taking part in the study, subject to management permission being obtained from the NHS/HSC R&D office prior to the start of the study (see "Conditions of the favourable opinion" below).

Conditions of the favourable opinion

The favourable opinion is subject to the following conditions being met prior to the start of the study.

Management permission or approval must be obtained from each host organisation prior to the start of the study at the site concerned.

Management permission ("R&D approval") should be sought from all NHS organisations involved in the study in accordance with NHS research governance arrangements.

Guidance on applying for NHS permission for research is available in the Integrated Research Application System or at http://www.rdforum.nhs.uk.

Where a NHS organisation's role in the study is limited to identifying and referring potential participants to research sites ("participant identification centre"), guidance should be sought from the R&D office on the information it requires to give permission for this activity.

For non-NHS sites, site management permission should be obtained in accordance with the procedures of the relevant host organisation.

Sponsors are not required to notify the Committee of approvals from host organisations.

It is the responsibility of the sponsor to ensure that all the conditions are complied with before the start of the study or its initiation at a particular site (as applicable).

You should notify the REC in writing once all conditions have been met (except for site approvals from host organisations) and provide copies of any revised documentation with updated version numbers. The REC will acknowledge receipt and provide a final list of the approved documentation for the study, which can be made available to host organisations to facilitate their permission for the study. Failure to provide the final versions to the REC may cause delay in obtaining permissions.

Approved documents
The documents reviewed and approved were:

Document	*Version*	*Date*
Evidence of insurance or indemnity		
GP/Consultant Information Sheets	1	01 March 2013
Investigator CV	Salter	
Investigator CV	Brown	
Investigator CV	Parker	
Investigator CV	XXXX	
Investigator CV	XXXX	
Other: Post interview information sheet	1	01 April 2013
Other: Impact of Event Scale		
Other: Patient Health Questionnaire-9		
Other: Weekly rating of intrusive memories/images		
Other: Clarification of sponsor		
Participant Consent Form	1	01 May 2013
Participant Information Sheet	1	01 May 2013
Protocol	1	01 March 2013
REC application	3.5	01 May 2013

Membership of the Proportionate Review Sub-Committee

The members of the Sub-Committee who took part in the review are listed on the attached sheet.

Statement of compliance
The Committee is constituted in accordance with the Governance Arrangements for Research Ethics Committees and complies fully with the Standard Operating Procedures for Research Ethics Committees in the UK.

After ethical review

Reporting requirements

The attached document "After ethical review – guidance for researchers" gives detailed guidance on reporting requirements for studies with a favourable opinion, including:

Notifying substantial amendments
Adding new sites and investigators
Notification of serious breaches of the protocol
Progress and safety reports
Notifying the end of the study

The NRES website also provides guidance on these topics, which is updated in the light of changes in reporting requirements or procedures.

Feedback

You are invited to give your view of the service that you have received from the National Research Ethics Service and the application procedure. If you wish to make your views known please use the feedback form available on the website.
Information is available at National Research Ethics Service website > After Review

13/NW/0432	**Please quote this number on all correspondence**

We are pleased to welcome researchers and R & D staff at our NRES committee members' training days – see details at http://www.hra.nhs.uk/hra-training/

With the Committee's best wishes for the success of this project.

Yours sincerely

Dr Lisa Booth, Chair
Email: nrescommittee.northwest-lancaster@nhs.net

Enclosures: *List of names and professions of members who took part in the review "After ethical review – guidance for researchers" [SL-AR2]*

Copy to: *Dr Gary Brown*
Ms Gill Dale, South London And Maudsley NHS Foundation Trust

NRES Committee North West - Lancaster

Attendance at PRS Sub-Committee of the REC meeting on 22 May 2013 Committee Members:

Name	*Profession*	*Present*	*Notes*
Dr Nigel Calvert	Associate Director of Public Health	Yes	
Mrs Gillian Rimington	Paralegal	Yes	
Professor Jois Stansfield	Professor of Speech Pathology	Yes	

Appendix 2. National Research Ethics Service Substantial Amendment Approval

Health Research Authority

National Research Ethics Service

NRES Committee North West –Lancaster
3rd Floor Barlow House
4 Minshull Street Manchester
M1 3DZ
Telephone: 0161 625 7434

16 October 2013

Miss Caroline Salter
Department of Clinical Psychology
Royal Holloway, University of London,
TW20 0EX

Dear Miss Salter

Study title:	What makes a good imagery rescript: Using verbal analysis to investigate the characteristics required to make a successful rescript in a clinical sample
REC reference:	13/NW/0432
Protocol number:	N/A
Amendment number:	1
Amendment date:	04 October 2013
IRAS project ID:	124012

Add a phase 3 – Investigating which characteristics are important to specific individuals. The above amendment was reviewed the Sub-Committee in correspondence.

Ethical opinion

The Committee request you add 2 extra points to your consent form:

1. I agree for the researchers to access my medical notes.
2. Standard clause

The members of the Committee taking part in the review gave a favourable ethical opinion of the amendment on the basis described in the notice of amendment form and supporting documentation.

Approved documents
The documents reviewed and approved at the meeting were:

Document	Version	Date
Participant Information Sheet	2	07 October 2013
Notice of Substantial Amendment (non-CTIMPs)	1	04 October 2013
GP/Consultant Information Sheets	2	07 October 2013
Participant Consent Form	2	07 October 2013
Protocol	2	07 October 2013

Membership of the Committee
The members of the Committee who took part in the review are listed on the attached sheet.

R&D approval
All investigators and research collaborators in the NHS should notify the R&D office for the relevant NHS care organisation of this amendment and check whether it affects R&D approval of the research.

Statement of compliance
The Committee is constituted in accordance with the Governance Arrangements for Research Ethics Committees and complies fully with the Standard Operating Procedures for Research Ethics Committees in the UK.

We are pleased to welcome researchers and R & D staff at our NRES committee members' training days – see details at http://www.hra.nhs.uk/hra-training/

13/NW/0432:	**Please quote this number on all correspondence**

Yours sincerely

Dr Lisa Booth Chair

E-mail: nrescommittee.northwest-lancaster@nhs.net

Enclosures: List of names and professions of members who took part in the review
Copy to: Ms Gill Dale, South London And Maudsley NHS Foundation Trust, Dr Gary Brown

NRES Committee North West - Lancaster Attendance at Sub-Committee by correspondence

Name	*Profession*	*Capacity*
Dr Lisa Booth	Senior Lecturer / Chair	Expert
Professor Jois Stansfield	Professor of Speech Pathology	Expert

Also in attendance:

Name	*Position (or reason for attending)*
Miss Anna Bannister	Assistant Co-ordinator

Appendix 3. Royal Holloway, Departmental Ethics Committee Approval

From: Psychology-Webmaster@rhul.ac.uk [mailto:Psychology-Webmaster@rhul.ac.uk]
Sent: 06 August 2013 12:52
To: XXXX@rhul.ac.uk;
Cc: PSY-EthicsAdmin@rhul.ac.uk;
Subject: Ref: 2013/010 Ethics Form Approved

Application Details:

Applicant Name: **Caroline Salter**

Application title: **Characteristics of a successful imagery re-script**

Comments: Approved. (Reviewers' feedback is given, below, for your information).

Reviewer 1.
Ethical issues for this study have clearly been carefully considered and ethical approval has already been obtained from NHS ethics. I have just a couple of minor comments:

Section 5: How many years should the transcriptions be kept for following study completion?

Information sheet: On page 2, para 2, 'All the information we do collect will stored' should be 'All the information we do collect will be stored'.

Consent form: It is mentioned that the therapist would obtain consent from participants. It wasn't clear who would be signing the consent forms. It might be ideal if both the therapist and one of the researchers sign the form. It's fine for the researcher to sign the form at a later date after receiving the forms from the therapist.

Reviewer 2.
Minor points: Length of time following which transcriptions will be destroyed is missing from section 5 (but information sheet says two years). Phone number missing from information sheet.

Despite the sensitive nature of this study, the ethical issues appear to have been considered fully and addressed carefully and I have no additional concerns.

Appendix 4. Royal Holloway, Departmental Ethics Committee Substantial Amendment

Approval

From: Psychology-Webmaster@rhul.ac.uk [mailto:Psychology-Webmaster@rhul.ac.uk]
Sent: 19 November 2013 17:50
To: XXXX
Cc: PSY - Ethics Admin;
Subject: Ref: 2013/010R1 Ethics Form Approved

Application Details: View the form click here Revise the form click here

Applicant Name: Gary Brown

Application title: Characteristics of a successful imagery re-script

Appendix 5. South West London and St George's Research and Development Approval

South West London and St.George's NHS
Mental Health NHS Trust

Research and Development

R&D Director: Dr Niruj Agrawal
c/o SECTION OF MENTAL HEALTH, PHSE DIVISION
HUNTER WING
CRANMER TERRACE
LONDON SW17 ORE

R&D Co-ordinator: Ms Enitan Eboda
E-mail: eeboda@sgul.ac.uk
Direct Line: 020 8725 3463/2783
Fax: 020 8725 3538/2914

Miss Caroline Salter

Department of Clinical Psychology,
Royal Holloway, University of London,
Egham Hill
Surrey
TW20 OEX

28 August 2013

Dear Caroline,

Research Title:	**What makes a good imagery rescript: using verbal analysis to investigate the characteristics required to make a successful rescript in a clinical sample.**
Principal Investigator:	**Miss Eleanor Parker**
Project reference:	**PF569**
Sponsor:	**Royal Holloway, University of London**

Following various discussions your study has now been awarded research approval. Please remember to quote the above project reference number on any future correspondence relating to this study.

Please note that, in addition to ensuring that the dignity, safety and well-being of participants are given priority at all times by the research team, host site approval is subject to the following conditions:

In addition to ensuring that the dignity, safety and well-being of participants are given priority at all times by the research team, you need to ensure the following:

- The Principal Investigator (PI) must ensure compliance with the research protocol and advise the host of any change(s) (e.g. patient recruitment or funding) by

following the agreed procedures for notification of amendments.Failure to comply may result in immediate withdrawal of host site approval.

- Under the terms of the Research Governance Framework, the PI is obliged to report any adverse events to the Research Office, as well as the REC, in line with the protocol and sponsor requirements. Adverse events must also be reported in accordance with the Trust Accident/Incident Reporting Procedures.

- The PI must ensure appropriate procedures are in place to action urgent safety measures.

- The PI must ensure the maintenance of a Trial Master File (TMF).

- The PI must ensure that all named staff are compliant with the Data Protection Act, Human Tissue Act 2005, Mental Capacity Act 2005 and all other statutory guidance and legislation (where applicable).

- The PI must comply with the Trust's research auditing and monitoring processes. All investigators involved in ongoing research may be subject to a Trust audit and may be sent an interim project review form to facilitate monitoring of research activity.

- The PI must report any cases of suspected research misconduct and fraud to the Research Office.

- The PI must provide an annual report to the Research Office for all research involving NHS patients, Trust and resources. The PI must also notify the Research Office of any presentations of such research at scientific or professional meetings, or on the event of papers being published and any direct or indirect impacts on patient care. This is vital to ensure the quality and output of the research for your project and the Trust as a whole.

- Patient contact: Only trained or supervised researchers holding a Trust/NHS contract (honorary or substantive) will be allowed to make contact with patients.

- Informed consent: is obtained by the lead or trained researcher according to the requirements of the Research Ethics Committee. The original signed consent form should be kept on file. Informed consent will be monitored by the Trust at intervals and you will be required to provide relevant information.

- Closure Form: On completion of your project a closure form will be sent to you (according to the end date specified on the R & D database), which needs to be returned to the Research Office.

- All research carried out within South West London & St George's Mental Health NHS Trust must be in accordance with the principles set out in the Department of Health's Research Governance Framework for Health and Social Care 2005 (2nd edition).

Failure to comply with the conditions and regulations outlined above constitutes research misconduct and the Research Office will take appropriate action immediately.

Please note, however, that this list is by no means exhaustive and remains subject to change in response to new relevant statutory policy and guidance. If you have any queries regarding the above points please contact Enitan Eboda, R&D Co-ordinator, on 020 8725 3463 (St. George's), e-mail: eeboda@sgul.ac.uk.

Yours sincerely,

Dr Niruj Agrawal

Research & Development Director
Chair, Research & Development Committee.

Cc: Miss Eleanor Parker, Royal Holloway, University of London
Dr XXXX, South West London & St George's Mental Health NHS Trust.

Appendix 6. South West London and St George's Research and Development Substantial

Amendment Approval

South West London and St.George's NHS
Mental Health NHS Trust

Research and Development
R&D Director: Dr Niruj Agrawal
c/o SECTION OF MENTAL HEALTH, PHSE DIVISION
HUNTER WING
CRANMER TERRACE
LONDON SW17 ORE

R&D Co-ordinator: Ms Enitan Eboda
E-mail: eeboda@sgul.ac.uk
Direct Line: 020 8725 3463/2783
Fax: 020 8725 3538/2914

Miss Caroline Salter
Department of Clinical Psychology,
Royal Holloway, University of London,
Egham Hill,
Surrey
TW20 OEX

16 October 2013

Dear Caroline,

Research Title:	**What makes a good imagery rescript: using verbal analysis to investigate the characteristics required to make a successful rescript in a clinical sample.**
Principal Investigator:	**Miss Eleanor Parker**
Project reference:	**PF569**
REC Reference:	**12/NW/0432**
Substantial Amendment:	**1**
Amendment Date:	**4th October 2013**
Sponsor:	**Royal Holloway, University of London**

I refer to your e-mail of 16th October 2013 , which outlined amendments to the previously approved proposal (ref. PF569).

I can confirm that I do not have any objections to the amendment to this study, since you have gone through the correct channels to seek approval from the relevant bodies. You may therefore accept this letter as official notification, on behalf of the R&D Committee, that the amendment has been accepted and the terms of R&D approval originally stated in our letter of 28h August 2013 still apply.

If you have any queries regarding the above points please contact Enitan Eboda, R&D Co-

ordinator, on 020 8725 3463 (St. George's), e-mail: eeboda@sgul.ac.uk.

Yours sincerely,

Dr Niruj Agrawal

Research & Development Director
Chair, Research & Development Committee.

Cc: Miss Eleanor Parker, Royal Holloway, University of London
Dr XXXX, South West London & St George's Mental Health NHS Trust.

Appendix 7. South London and the Maudsley Research and Development Approval

Institute of Psychiatry
at The Maudsley
Research and Development Office
Box P005
De Crespigny Park
Denmark Hill
London SE5 8AF
Tel +44 (0)20 7848 0790
Fax +44(0)20 7848 0147
http://www.kcl.ac.uk/iop/research/office/index.aspx
KING'S College LONDON Founded 1829

Miss Caroline Salter
Department of Clinical Psychology
Royal Holloway, University of London Egham
TW20 OEX

1 May 2014

Dear Miss Salter

Trust Approval: R&D2014/042
Title: What makes a good imagery rescript: using verbal analysis to investigate the characteristics required to make a successful rescript in a clinical sample
REC Reference: 13/NW/0432

I am writing to confirm approval for the above research project at South London and Maudsley NHS Foundation Trust. This approval relates to work in the Mood, Anxiety and Personality CAG and to the specific protocol and informed consent procedures described in your R&D Form. Any deviation from this document will be deemed to invalidate this approval. Your approval number has been quoted above and should be used at all times when contacting this office about this project.

Amendments, including extending to other Trust directorates will require further approval from this Trust and where appropriate the relevant Research Ethics Committee. Amendments should be submitted to this R&D Office by completion of an R&D Amendment form together with any supporting documents. A copy of this is attached (R and D Amendment Form V3.doc), but is also available on the R&D Office website.
King's College London - Research and development approval

I note that Royal Holloway University of London will be taking on the role of Sponsor for this study.

Approval is provided on the basis that you agree to adhere to the Department of Health's Research Governance requirements including:

- Ethical approval must be in place prior to the commencement of this project.
- As Chief Investigator and/or Principal Investigator for this study you have familiarised yourself with and accept the responsibilities commensurate with this

position, as outlined in the Research Governance Framework

http://www.dh.gov.uk/prod_consum_dh/groups/dh_digitalassets/@dh/@en/documents/digitalasset/dh_4122427.pdf

- Compliance with all policies and procedures of the Trust which relate to research and with all relevant requirements of the Research Governance Framework. In particular the Trust Confidentiality Policy.

  http://www.slam.nhs.uk/media/107386/confidentiality%20policy.pdf

- Co-operating with the Trust R&D Office's regular monitoring and auditing of all approved research projects as required by the research governance framework, including complying with ad hoc requests for information.

- Informing the Trust's Health and Safety Coordinators and/or the Complaints Department or of any adverse events or complaints, from participants recruited from within this Trust, which occurs in relation to this study in line with Trust policies. Contact details are available from the R&D Office if required.

- Sending a copy of any reports or publications which result from this study to the Trust Departments involved in the study if requested.

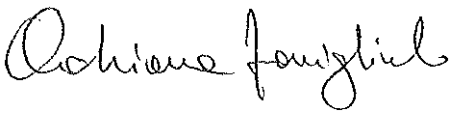
- Honorary Contracts must be in place prior to patient contact for all relevant members of the research team. Advice on this will be provided by the R&D Office at the point of obtaining R&D approval and on an ongoing basis for new members of staff joining the research team.

- Sending a copy of the annual reports and end of project notification submitted to ethics.

Failure to abide by the above requirements may result in the withdrawal of the Trust's approval for this research.

If you wish to discuss any aspect of this research approval with the R&D Office, please contact Jenny Liebscher jennifer.liebscher@kcl.ac.uk in the first instance.

I wish you every success with this study. Yours sincerely



Adriana Fanigliulo
Research Governance Facilitator
SLaM/IoP R&D Office

Enc. R&D Approval Amendment Form

Appendix 8. Patient Health Questionnaire-9 (Kroenke et al., 2001)

PATIENT NUMBER: _____ DATE: _____ TIME 1 / 2 (delete as appropriate)

Over the last 2 weeks, how often have you been bothered by any of the following problems?				
	Not at all 0	Several days 1	More than half the days 2	Nearly every day 3
1 Little interest or pleasure in doing things				
2 Feeling down, depressed, or hopeless				
3 Trouble falling or staying asleep, or sleeping too much				
4 Feeling tired or having little energy				
5 Poor appetite or overeating				
6 Feeling bad about yourself — or that you are a failure or have let yourself or your family down				
7 Trouble concentrating on things, such as reading the newspaper or watching television				
8 Moving or speaking so slowly that other people could have noticed? Or the opposite — being so fidgety or restless that you have been moving around a lot more than usual				
9 Thoughts that you would be better off dead or of hurting yourself in some way				
PHQ9 total score _____=	_____ +	_____ +	_____ +	_____

Appendix 9. Impact of Event Scale (Horowitz et al., 1979)

Participant number: **Session no:** **Date:**

Below is a list of comments made by people after stressful life events.

Please check each item indicating how frequently these comments were true for you *during the past 7 days or other agreed time period* for the **specific memory agreed on with your therapist**. If they did not occur during that time, please mark the *"not at all"* column.

The **specific memory** this questionnaire refers to is_____

		Frequency *not at all-rarely-sometimes-often* *0* *1* *3* *5*
A	I thought about it when I didn't mean to	
B	I avoided letting myself get upset when I thought about it or was reminded of it	
C	I tried to remove it from memory	
D	I had trouble falling asleep or staying asleep, because of pictures or thoughts about it that came into my mind	
E	I had waves of strong feelings about it	
F	I had dreams about it	
G	I stayed away from reminders of it	
H	I felt as if it hadn't happened or it wasn't real	
I	I tried not to talk about it	
J	Pictures about it popped into my mind	
K	Other things kept making me think about it	
L	I was aware that I still had a lot of feelings about it, but I didn't deal with them	
M	I tried not to think about it	
N	Any reminder brought back feelings about it	
O	My feelings about it were kind of numb	

For researcher use only: *Intrusion total = a, d, e, f, j, k, n =* _____

*Avoidance total = b, c, g, h, i, l, m, o =*_____

Appendix 10. Visual Analogue Scale (Brewin et al., 2009)

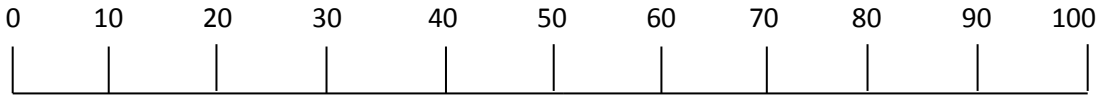
Participant number: **Session no:** **Date:**

Please circle a number from the scales below which best describes your experience over the last week of the particular distressing intrusive image or memory that you identified with your therapist.

The specific memory this questionnaire refers to is _____

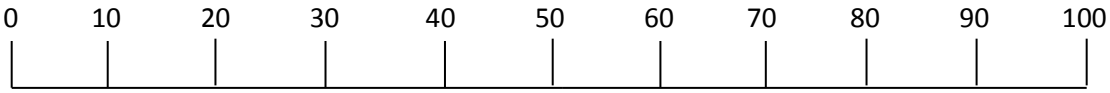
_____

1. How many times did you experience intrusive images or memories in the last week?



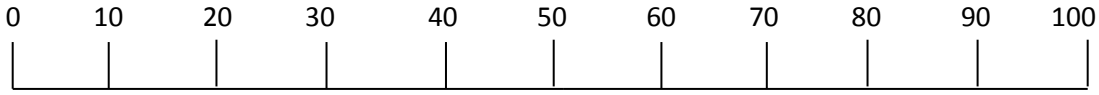
None of the time **Half the time** **All of the time**

2. How much did intrusive images or memories interfere with your daily life?



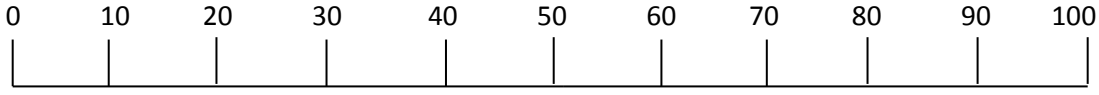
Not at all **Moderately** **Severely**

3. How uncontrollable were your intrusive images or memories in the last week?



Not at all **Moderately** **Completely**

4. How distressing were your intrusive images or memories?



Not at all **Moderately** **Severely**

Appendix 11. Participant Information Sheet and Consent Form

Participant Information Sheet
REC number: **13/NW/0432**

Dear Potential Participant,

We are two trainees studying for a Clinical Psychology Doctorate at Royal Holloway, University of London. For our thesis, we are conducting a research project in which we would like to invite you to participate.

<u>You should only participate if you wish to do so; choosing not to take part will not disadvantage you in any way or alter your current care.</u>

Before you decide whether you want to take part, it is important for you to understand why the research is being done and what your participation will involve. Please take time to read the following information carefully and discuss it with others if you wish. Ask us if there is anything that is not clear or if you would like more information.

WHY?
You have been invited to participate in this research project as you are currently receiving therapy for trauma. One of the ways your therapist may work with you to overcome your difficulties is through the use of imagery. This technique has been shown to be an effective treatment method. However, more research is required to find out exactly how it works. It is important for psychologists to gain this deeper understanding in order for the technique to progress and for the health service to provide even more effective treatment for people who have experienced trauma. This study will therefore attempt to look in greater detail at what exactly makes using imagery work in therapy effective.

HOW?
You will be asked to complete some questionnaires, which will ask you about your current mood and any distressing images that you might experience. These will be completed on a number of occasions, before starting your course of treatment, before your treatment sessions and one week after finishing treatment.

The study will involve your therapist recording at least one and at most all of your therapy sessions that included imagery work. You will always be informed if the therapist would like to record the session and can chose to decline if you wish. Once your session has been recorded, it will be written out by the researchers. This data will be kept strictly confidential.

To ensure this, participant numbers will be used instead of names and recordings will be destroyed upon transcription. This way information given cannot be linked back to you.

No one other than the researchers will have access to the data collected. The anonymous written transcripts will be kept on a password protected computer and in a secure cabinet in the clinic that only the researchers can access. They will be destroyed after five years.

We will also need to access your records held by your therapist during the course of the study. This is so we can collect information such as how many treatment sessions you have had, your gender and the type of traumatic event that you have experienced. We will NOT take a record of your name, date of birth, address or any other information that may make you identifiable. All the information we do collect will stored in password-protected computer files that only we have access to.

Potential disadvantages and/or advantages to taking part in this research

Completing these questionnaires may be tiring. In addition, some questions which ask you to think about your mood and other symptoms may stir up upsetting thoughts. If this is the case, please feel free to stop the questionnaires and speak to your clinician. However, by completing the questionnaires, it may be nice for you to see any change that might have occurred over the week. Also, on a wider level, taking part in this research may further improve this type of therapy and benefit people in the future who are experiencing similar difficulties to you

Other information

We would like to be able to contact your GP to let them know that you will be participating in the study.

Participation in this study is strictly voluntary and you have the right to withdraw at any time without giving a reason. You may also withdraw your data after participation from the study up until it is transcribed for use in the final report (01.04.2014). Leaving the study and/or withdrawing the data will have no negative consequences. You may ask questions at any point before, during or after the study.

Researchers can be contacted using the following e-mail addresses:
Eleanor Parker - eleanor.parker.2011@rhul.ac.uk
Caroline Salter – caroline.salter.2011@rhul.ac.uk

Or, leave a message on our answer machine on the number below with your name and contact number and we will return your call as soon as possible: **01784 472746**

Thank you for your time,

Eleanor and Caroline
Trainee Clinical Psychologists,
Royal Holloway, University of London

Please complete this form after you have read the Information Sheet and/or listened to an explanation about the research.

Title of Study: _____

College Research Ethics Committee Ref:_____

Thank you for considering this research project. The person organising the research must explain the project to you before you agree to take part. If you have any questions arising from the Information Sheet or explanation already given to you, please ask the researcher before you decide whether to join in. You will be given a copy of this Consent Form to keep and refer to at any time.

- *I understand that if I decide at any other time during the research that I no longer wish to participate in this project, I can notify the researchers involved and be withdrawn from it immediately.*

- *I agree for the researchers to access my medical notes*

- *I consent to the processing of my personal information for the purposes of this research study. I understand that such information will be treated as strictly confidential and handled in accordance with the provisions of the Data Protection Act 1998*

- *I understand that relevant, sections of my medical notes and data collected during the study, may be looked at by individuals from Royal Holloway University, from regulatory authorities or from the NHS Trust, where it is relevant to my taking part in this research. I give permission for these individuals to have access to my records.*

- *I do/do not (please delete as appropriate) give consent for the researchers to alert my General Practitioner (GP) to my involvement in this study.*

Participant's Statement: I_____ agree that the research project named above has been explained to me to my satisfaction. I agree to take part in the study. I have read both the notes written above and the Information Sheet about the project and understand what the research study involves.

Signed **Date**

Investigator's Statement: I _____confirm that I have carefully explained the nature, demands and any foreseeable risks (where applicable) of the proposed research to the volunteer.

Signed **Date**

Appendix 12. Participant Debrief Form

What makes a good re-script? Identifying important factors for re-script efficacy

Participant Post-Interview Information Sheet

Thank you for allowing us to record and listen to your imagery re-scripting session. Below is a description of the background, purpose and potential implications of this research project.

Numerous studies have found that Imagery Re-scripting (ImRs) can be an effective treatment for a range of mental health problems, including depression and post-traumatic stress disorder (PTSD). However, little is understood about the reasons why ImRs is effective or how it works.

A number of researchers have suggested various factors that might increase the efficacy of ImRs. Vividness of the image, believability, a person's sense of mastery and/or control over the image and the emotions elicited by the image have all been suggested as potential important factors, to name but a few. Currently however, no study has tried to systematically understand the factors involved in ImRs.

This research aims to use real ImRs sessions to identify factors that may be key in promoting re-script efficacy. It is hoped that by doing so, ImRs can continue to develop, so that future clients undergoing ImRs can receive the most effective treatment possible.

Further information and contact details
If you would like to receive a copy of the final report or have any questions or comments, please email Caroline Salter or Eleanor Parker at the address below.

Researchers
Caroline Salter & Eleanor Parker
Clinical Psychology Department
Royal Holloway
University of London
Egham
TW20 0EX
Tel: 01784 414636

Email: caroline.salter.2011@live.rhul.ac.uk
Eleanor.parker.2011@live.rhul.ac.uk

Research Supervisor
Dr Gary Brown
Clinical Psychology Department
Royal Holloway
University of London
Egham
TW20 0EX

Email: gary.brown@rhul.ac.uk

Appendix 13. Coding Scheme

Theme	Sub-theme	Response	Example
1. Pre-imagery			
1.1. ImRs preparation	1.1.1 The ImRs has been previously rehearsed	1.Yes (verbally) 2. Yes (in an earlier re-script) 3. No(re-script develops spontaneously) 4. Unclear / unknown 5. Other (specify)	
	1.1.2. Who the ImRs is prepared by	1.ImRs solely developed by client 2.ImRs mostly developed by client 3.ImRs developed equally by client and therapist 4.ImRs mostly developed by therapist 5.ImRs solely developed by therapist 6.N/a, there is no pre ImRs preparation	
	1.1.3. Agreed aim of the re-script	1.Safety 2.Comfort / compassion 3.Revenge 4.Assertiveness 5.Control 6.Other (specify) 7.N/a, there is no pre-agreed aim	
	1.1.4. Memory aids used in the session	1.Memory aids e.g., flashcards or recordings are used (please specify) 2. Memory aids not used	
1.2. Attitude towards the re-script process	1.2.1. Client understanding	1.Understands rationale 2. Does not understand rationale 3. Unclear / unknown	

	1.2.2. Client motivation	1. Motivated 2. Unsure but willing to try 3. Does not believe it will work 4. Fearful 5. Unclear / unknown 6. Other (specify)	
2. Whole process			
2.1. Client's ability to follow ImRs	2.1.1. Amount of guidance given by the therapist	1.Client is able to guide themselves through the re-script with no prompting from therapist 2.Client is able to guide themselves through the re-script with little prompting from therapist 3.Client and therapist guide the re-script equally 4.ImRs is mostly guided by the therapist 5.ImRs is completely guided by the therapist 6. Unclear / unknown	
	2.1.2. Client's ability to stay with the image	1.Client stays with image throughout 2.Client stays with image mostly 3.Client struggles to stay with image 4.Client cannot stay with image at all 5.Client dissociates 6. Unclear / unknown	
	2.1.3. The re-scripting process follows a coherent narrative	1.Yes 2. Yes, with prompts 3. In part 4. No, hard to follow 5. Unclear / unknown	
	2.1.4. Speed of the image	1.Real time 2.Slowed down 3.Fast forward 4.Unclear / unknown	

2.2. Activation of the image	2.2.1. Described in first person	1.Yes 2.No (specify which) 3.Mixed (specify which)	
	2.2.2. Tense used	1.Past 2.Present 3.Future 4.Mixed (specify which) 5.Other	
	2.2.3. Visualised (can the re-script be seen in the mind?)	1.Yes (“I can see it easily”) 2.Sometimes (“It's hard to keep the image”) 3. No (“I can't see anything clearly”) 4. Unclear/unknown	
	2.2.4. Eyes open	1.Eyes open 2.Eyes closed 3.Unclear / unknown	
	2.2.5. Senses involved	1.Touch 2. Taste 3. Sight 4. Sound 5. Smell	
	2.2.6. Perspective taken	1. Field 2. Observer 3. Mixed	
	2.2.7. Vividness of the re-script (how clear, intense or strong is the re-script)	1. Very vivid (“I can see/ hear/ smell/ feel/ taste it very clearly”) 2. Vivid (“I can see/ hear/ smell/ feel/ taste it clearly”) 3. Some parts are vivid (“Mostly all the detail is there”) 4. Not vivid (“everything is a bit blurred”) 5. Unclear / unknown	

3. Re-living			
3.1. Activation of original internal processes	3.1.1. Presence of trauma-related emotions during the re-scripting session	1. Most or all trauma-related emotions are present in the session 2. Some trauma-related emotions are present during the session 3. Trauma-related emotions are absent in the re-scripting session 4. Unclear / unknown	
	3.1.2. Type of trauma-related emotions during the re-scripting session	1. All positive 2. Mainly positive 3. Mixed 4. Mainly negative 5. All negative 6. Specify all emotions present in the re-script that were present during the original traumatic image	
	3.1.3. Intensity of trauma-related emotions present during the re-scripting session	1.Very intense 2. Intense 3. Present, but not very intense 4. Little or no intensity 5. Unclear / unknown	
	3.1.4. Presence of trauma-related physiological sensations during the re-scripting session	1.Most or all trauma-related physiological sensations are present in the re-scripting session 2. Some trauma-related physiological sensations are present during the session 3. Trauma-related physiological sensations are absent in the re-scripting session 4. Unclear / unknown 5. Specify all physiological sensations present in the re-script that were present during the original traumatic image	
	3.1.5. Intensity of the trauma-related physiological responses present during the re-scripting session	1.Very intense 2. Intense 3. Present, but not very intense 4. Little or no intensity 5. Unclear / unknown	

	3.1.6. Presence of trauma-related cognitions present during the re-scripting session	1.Most or all trauma-related cognitions are present in the re-scripting session 2. Some trauma-related cognitions are present during the session 3. Trauma-related cognitions are absent in the re-scripting session 4. Unclear / unknown 5. Specify all cognitions present in the re-script that were present during the original traumatic image	
	3.1.7. Intensity of trauma-related cognitions present during the re-scripting session	1. Very intense 2. Intense 3. Present, but not very intense 4. Little or no intensity 5. Unclear / unknown	
4. Re-script			
4.1 Departure from the original image	4.1.1. Setting	1. The whole of the image takes place in the original setting 2. Image begins in the original setting, but then moves to a new setting 3. The whole of the image takes place in a different setting 4. Unclear / unknown	
	4.1.2. When the rescript occurs	1. A while before the traumatic image (please specify) 2. Immediately before the traumatic image 3. During the traumatic image 4. Immediately after the traumatic image 5. A while after the traumatic image (please specify)	
	4.1.3. Amount of new image	1.All new (e.g., safe place imagery) 2. Mostly new image, some old 3. Half original image, half new re-script 4. Mostly old image, some new 5. No change from original (e.g., re-living only)	

4.2.Others in the re-script	4.2.1. Individuals present in the re-script	1. Perpetrator 2. Client as they were at the time of the image 3. Strangers 4. Family 5. Therapist 6. Client as adult / current self 7. Friends 8. Fictional character e.g., an angel 9. Other (please specify)	
	4.2.2. Individuals present in rescript were present during the original intrusive image	1. Yes 2. No 3. Unknown	
	4.2.3. Individuals' emotional reactions	Specify emotions	
	4.2.4. Actions of the individuals present	1. Protect client 2. Take client to safety 3. Attack / seek revenge on perpetrator 4. Comfort / Care for client 5. Speak on behalf of / stand up for client 6. Berates the perpetrator 7. Other (specify)	
	4.2.5. Presence of physical contact	1. Yes 2. No	
	4.2.6. Anything said by each individuals	1. Yes (please specify main messages) 2. No	
	4.2.7. Individual in the image responsible for the change	1. Perpetrator 2. Client as they were at the time of the image 3. Strangers 4. Family 5. Therapist 6. Client as adult / current self 7. Friends 8. Fictional character e.g., an angel 9. Other	

4.3. Believability	4.3.1. The client experienced something similar in real life	1.Yes (exactly the same) 2. Yes (similar) 3. No 4. Unclear / unknown	
	4.3.2. It feels believable to the client, regardless of whether it is physically possible	1.Yes (feels as though it could have happened) 2. No (feels very alien, can't connect) 3. Unclear / unknown	
	4.3.3. The re-script is an event that is physically possible given constraints of space and time	1. Yes (e.g., my mum protected me) 2. No (e.g., an angel saved me) 3. Unclear / unknown	
	4.3.4. Part of the re-script can be used as practice for a potential future real world situation	1.Yes 2.No 3.Unclear / unknown	
4.4. Activation of internal processes during the re-script	4.4.1. Emotions are present during the re-script	1. Yes 2. No 3. Unclear/unknown	
	4.4.2. Type of emotions present during the re-script	1. All positive 2. Mainly positive 3. Mixed 4. Mainly negative 5. All negative 6. Unclear/unknown 7. Specify emotions present during the re-scripted part of the image	
	4.4.3. Intensity of the emotional response during the re-script	1. Very intense 2. Intense 3. Present, but not very intense 4. Little or no intensity 5. Unclear / unknown	
	4.4.4. Emotions have shifted from those present in the original image	1. Yes 2. No 3. Unclear/unknown 4. Specify (from x to y)	

	4.4.5. Humour used	1. Yes 2. No 3. Unclear / unknown	
	4.4.6. Physiological sensations are present during the re-script	1.Yes 2.No 3. Unclear / unknown 4. Specify all physiological sensations present during the re-script	
	4.4.7. Intensity of the physiological response during the re-script	1.Very intense 2. Intense 3. Present, but not very intense 4. Little or no intensity 5. Unclear / unknown	
	4.4.8. Physiological sensations have shifted from those present in the original image	1. Yes 2. No 3. Unclear/unknown 4. Specify (from x to y)	
	4.4.9. Cognitions are present during the re-script	1. Yes 2. No 3. Unclear / unknown 4. Specify all cognitions present during the re-script	
	4.4.10. Intensity of the cognitions present during the re-script	1. Very intense 2. Intense 3. Present, but not very intense 4. Little or no intensity 5. Unclear / unknown	
	4.4.11. Cognitions have shifted from those present in the original image	1.Yes (please specify) 2. No 3. Unclear / unknown	

5. Outcome			
5.1. Definition of the outcome	5.1.1. The final outcome	1. Protect client 2. Take client to safety 3. Attack / seek revenge on perpetrator 4. Comfort / Care for client 5. Speak on behalf of / stand up for client 6. Berates the perpetrator 7. Other (specify)	
	5.1.2. Is the outcome as it was intended at the beginning	1. Yes 2. No 3. In part 4. Unclear / unknown 5. Not applicable	
	5.1.3. The outcome meets a previously unmet need	1.Yes (please specify) 2. Some are, not all 3. No 4. Unclear / unknown	
5.2. Attitude towards outcome	5.2.1. The final message taken from the re-script	1. Positive 2. Negative 3. Neutral 4. Unclear / unknown 5. Specify	
	5.2.2. The original meaning associated with the traumatic image has changed	1.Yes 2. No 3. In part 4.Unclear / unknown	
	5.2.3. Is the final emotion positive	1. Yes 2. No 3. Unclear / unknown	
	5.2.4. Expectedness of the outcome	1. Client is surprised at the outcome 2. Client expected the outcome 3. Unclear / unknown 4. Other (please specify)	

Appendix 14. Coding Scheme Handbook

This scoring guide has been designed to aid scoring and interpretation of the coding scheme. However, given the complex nature of ImRs sessions, it should be used as a framework to capture the details of ImRs sessions, rather than a definitive list of all components that must be present during an ImRs session. It is likely that multiple responses within codes will be applicable to a client's ImRs session. When this is the case, tick all that apply. When an ImRs factor does not fit neatly into one of the responses, select other and summarise the factor in a way that best captures that particular factor during that session.

1. Pre-imagery themes. The themes in this section refer to discussions conducted during the session *before* ImRs takes place.

1.1 ImRs preparation.

1.1.1. The ImRs has been previously rehearse.

1. Yes (verbally): the client and therapist discuss and agree upon the content of ImRs before beginning any imagery work
2. Yes (in an earlier re-script): the client and therapist agree to repeat or modify a re-script that has been worked on in an earlier session
3. N (re-script develops spontaneously): the client and therapist begin the re-script without an agreement about the direction of the re-script
4. Unclear / unknown
5. Other

1.1.2 Who the ImRs is prepared by.

1. ImRs solely developed by client: the client requires no help from the therapist to decide the direction that they want the ImRs to take
2. ImRs mostly developed by client: client knows which direction they want the ImRs to take, but requires some support from the therapist in thinking how to bring in those changes *or* the client requires help from the therapist to think about what could change, but is then able to decide how to instigate this change alone
3. ImRs developed equally by client and therapist: client and therapist share responsibility to coming up with an agreed change in the image and how to instigate this change
4. ImRs mostly developed by therapist: client requires the therapist to suggest possible changes to the image and requires therapist input to think about how to bring about those changes
5. ImRs solely developed by therapist: therapist is solely responsible for deciding upon the direction of change in the ImRs
6. N/a, there is no pre ImRs preparation: client and therapist begin ImRs with no pre-agreed aim

1.1.3. Agreed aim of the re-script.

1. Safety: it is agreed that the client will feel protected by the end of the image or taken to a place of safety
2. Comfort / compassion: it is agreed that the client will feel comforted by the end of the image, for example, by being spoken kindly towards, or by being hugged
3. Revenge: it is agreed that the client will seek revenge on the perpetrator, either through their own actions, or the actions of someone else, for example by assaulting them
4. Assertiveness: it is agreed that the client will express their needs and stand up for themselves, or have someone else do this for them
5. Control: it is agreed that the client will take control of the situation by the end of the image
6. Other (specify)
7. N/a, there is no pre-agreed aim

1.1.4. Memory aids are used in the session. This theme refers to any memory aides that are used in the session. It does not include any memory aides that client choses to take home with them but does not use during the session e.g., recordings of the session.

1. Memory aids e.g., flashcards or recordings are used in the session to help guide the client through the ImRs
2. Memory aids not used in the session

1.2. Attitude towards the ImRs process.

1.2.1. Client understanding.

1. Understands rationale: client has had the process of ImRs explained to them and understands why this method is being used in the session
2. Does not understand rationale: client has had the process of ImRs explained to them, but is not clear why this method is being used in the session
3. Unclear / unknown

1.2.2. Client motivation.

1. Motivated: client is willing and eager to try ImRs
2. Unsure but willing to try: client is hesitant about trying ImRs, but agrees to try it
3. Does not believe it will work: client does not think ImRs will have any impact on their symptoms and is against trying it
4. Fearful: client is afraid of using ImRs e.g., because it means accessing the original image
5. Unclear / unknown
6. Other

2. Whole process themes. Themes in this section refer to the whole of the work with the image itself. This includes work with any or the entire original image and work with the image following the point of change.

2.1 Client's ability to follow ImRs.

2.1.1. Amount of guidance given by the therapist.

1. Client is able to guide themselves through the re-script with no prompting from therapist: client is able to bring to mind and vividly describe the re-scripted image with no input from the therapist
2. Client is able to guide themselves through the re-script with little prompting from therapist: client is able to bring to mind and vividly describe most of the re-scripted image, but requires an occasional prompt, e.g., to capture more detail or to bring in additional changes
3. Client and therapist guide the re-script equally: client is able to follow therapist prompts in order to bring to mind and vividly describe the re-scripted image. Without these prompts, it is likely that the client would leave out details or become stuck trying to instigate change.
4. ImRs is mostly guided by the therapist: the client finds it difficult to describe the image and to introduce change. Therapist prompts do not facilitate the process. As a result, the therapist has to become actively involved in the description of the event.
5. ImRs is completely guided by the therapist: the client is solely reliant on the therapist for guiding the re-script. They are not able to guide any of the image themselves
6. Unclear/unknown

2.1.2. Client's ability to stay with the image. This should be coded regardless of how much guidance the therapist gives. For example, if the ImRs is completely guided by the therapist, but the client can easily follow the ImRs when the therapist takes the lead, this should be coded as point 1.

1. Client stays with image throughout: client is able to bring to mind and stay with the image throughout the whole of the ImRs session
2. Client stays with image mostly: client is able to bring to mind and stay with the image for most of ImRs session, but may come out of image at times e.g., if it gets too distressing, if they require clarification or if they start to talk about the memory or event more generally
3. Client struggles to stay with image: client is able to stay with the image at times, but frequently comes back to the therapy room
4. Client cannot stay with image at all: client is unable to bring the image to mind e.g., because it is too distressing
5. Client dissociates: client loses awareness of surroundings
6. Unclear/unknown

2.1.3. The re-scripting process follows a coherent narrative.

1. Yes: it is easy for the listener to understand what is happening in the image, the narrative runs like a coherent film script. The client is able to develop this narrative with no prompting from the therapist.

2. Yes, with prompts: it is easy for the listener to understand what is happening in the image and the narrative runs like a coherent film script. The client requires prompts from the therapist to aid with the narrative. Without these prompts, it is likely that details would be missing
3. In part: it is easy for the listener to understand what is happening in parts of the image. However, the narrative tends to jump from section to section
4. No, hard to follow: there is no coherent narrative, making it difficult for the listener to understand the plot of the image
5. Unclear/unknown

2.1.4. Speed of the image.

1. Real time: all or part of the image is viewed at the speed at which it would have actually happened
2. Slowed down: all or part of the image is viewed in slow motion
3. Fast forward: all or part of the image is sped up, as if having hit a fast-forward button
4. Unclear / unknown

2.2. Activation of the image.

2.2.1. Described in first person.

1. Yes: the image is mostly described using the first person.
2. No: the image is not described in the first person. Other tenses e.g., the third person is used.
3. Mixed: both the third and first person tense is used.

2.2.2. Tense used

1. Past: the image is mostly or entirely described in the past tense
2. Present: the image is mostly or entirely described in the present tense
3. Future: the image is mostly or entirely described in the future tense
4. Mixed (specify which): there is no predominantly used tense
5. Other

2.2.3. Visualised.

1. Yes: the client can see the image easily in the mind's eye
2. Sometimes: parts of the image can be seen easily in the mind's eye
3. No: very little or none of the image can be seen clearly (I can't see anything clearly)
4. Unclear/unknown

2.2.4. Eyes open.

1. Eyes open: client has their eyes open through most or all of the ImRs session
2. Eyes closed: client has their eyes closed through most or all of the ImRs session
3. Unclear / unknown

2.2.5. Senses involved.

1. Touch: the client describes sensations of touch during the image e.g., pain, being hugged, etc.
2. Taste: the client describes what they can taste during the image
3. Sight: the client describes what they can see during the image
4. Sound: the client describes what they can hear during the image
5. Smell: the client describes what they can smell during the image

2.2.6. Perspective taken.

1. Field: the client describes the image as if they are in the image, regardless of whether this is as their past- or current-self
2. Observer: the client describes the image as if watching events unfold from a distance or from above
3. Mixed: both an observer and a field perspective are used at different points of the session

2.2.7. Vividness.

1. Very vivid: the client creates an image that is very clear and intense throughout the entirety of the session. All aspects of the image are experienced and described in great detail
2. Vivid: the client creates an image that is clear and intense throughout the majority of the session. Most aspects of the image are experienced and described in great detail
3. Some parts are vivid: the client creates an image where parts are clear and intense, while other parts are lacking in clarity
4. Not vivid: the client is not able to bring to mind an image that is clear
5. Unclear / unknown

3. Re-living. Themes in this section refer to all parts of the session that involve working with the original intrusive image, regardless of whether the original image is re-lived in full or not. As a general rule, these themes refer to any work with the image up to the point where change is introduced. However, as some clients will have elements of their original image present following change, these themes may also apply following the point of change.

3.1. Activation of original internal processes. This theme refers to the activation of any of the emotions, cognitions and physical sensations during the ImRs session that were present during the original event, or during activation of the original image.

3.1.1. Presence of trauma-related emotions during the re-scripting session.

1. Most or all trauma-related emotions are present in the session: the client accesses exactly how they felt emotionally at the time of the original event and/or how they feel when accessing the original intrusive image
2. Some trauma-related emotions are present during the session: the client accesses some of the emotions they felt at the time of the original event and/or how they feel when accessing the original intrusive image.

3. Trauma-related emotions are absent in the re-scripting session: the client does not access the emotions experienced at the time of the original event and/or how they feel when accessing the original intrusive image
4. Unclear / unknown

3.1.2. Type of trauma-related emotions during the re-scripting session.

1. All positive: all original emotions experienced during the session are positive
2. Mainly positive: most original emotions experienced during the session are positive
3. Mixed: original emotions experienced during the session are both positive and negative
4. Mainly negative: original emotions experienced during the session are mainly negative
5. All negative: all original emotions experienced during the session are negative
6. Specify: specify all emotions present in the re-script that were present during the original traumatic image. For example, if the person reported feeling scared at the time of the event/when experiencing the image and feels scared during ImRs, note down 'scared'

3.1.3. Intensity of trauma-related emotions during the re-scripting session.

1. Very intense: trauma-related emotions are experienced very intensely. Only select this option if it is clear that the client is experiencing these emotions very intensely, either through self-report, for example 80-100% intensity, or because the client is audibly distressed
2. Intense: trauma-related emotions are experienced intensely. Select this option if it is clear that the client is experiencing these emotions but they appear controllable in the session (e.g., 50-80% when the client is asked to rate the intensity).
3. Present, but not very intense: trauma-related emotions are present in the description of how the client feels, but are present at a low level (e.g., less than 50% when the client is asked to rate).
4. Little or no intensity: the client does not access trauma-related emotions during the session. It may be that the client does not express these emotions, or that they report how they felt at the time but do not feel that way now in the therapy room
5. Unclear / unknown

3.1.4. Presence of trauma-related physiological sensations during the re-scripting session.

1. Most or all trauma-related physiological sensations are present in the re-scripting session: the client is able to access exactly how they felt physically at the time of the original event and/or how they feel when accessing the original intrusive image
2. Some trauma-related physiological sensations are present during the session: the client accesses some, but not all, of the physiological sensations they felt at the time of the original event and/or how they feel when accessing the original intrusive image
3. Trauma-related physiological sensations are absent in the re-scripting session: the client does not access the physiological sensations experienced at the time

of the original event and/or how they feel when accessing the original intrusive image
4. Unclear / unknown
5. Specify: specify all physiological sensations present in the session that were present during the original traumatic image. For example, if the person reported feeling pain at the time of the event/when experiencing the image and feels pain during ImRs, note down 'pain'

3.1.5. Intensity of the trauma-related physiological response during the re-scripting session.

1. Very intense: trauma-related physiological sensations are experienced very intensely. Only select this option if it is clear that the client is experiencing these sensations very intensely through self-report, for example 80-100% intensity
2. Intense: trauma-related physiological sensations are experienced intensely. Select this option if the client reports experiencing these sensations but they appear controllable in the session (e.g., 50-80% when the client is asked to rate the intensity).
3. Present, but not very intense: trauma-related physiological sensations are present in the description of how the client feels, but are experienced at a low level (e.g., less than 50% when the client is asked to rate).
4. Little or no intensity: the client does not access trauma-related physiological sensations during the session. It may be that the client does not express these sensations, or that they report how they felt at the time but do not feel that way now in the therapy room
5. Unclear / unknown

3.1.6. Presence of trauma-related cognitions during the re-scripting session.

1. Most or all trauma-related cognitions are present in the re-scripting session: the client is able to access exactly what they thought at the time of the original event and/or what they think when accessing the original intrusive image
2. Some trauma-related cognitions are present during the session: the client accesses some, but not all, of the cognitions they had at the time of the original event and/or how they think when accessing the original intrusive image
3. Trauma-related cognitions are absent in the re-scripting session: the client does not access the cognitions experienced at the time of the original event and/or how they think when accessing the original intrusive image
4. Unclear / unknown
5. Specify: specify all cognitions present in the session that were present during the original traumatic image. For example, if the person reported feeling 'it's my fault' at the time of the event/when experiencing the image and reports thinking this during ImRs, note down 'it's my fault'

3.1.7. Intensity of trauma-related cognitions present during the re-scripting session.

1. Very intense: trauma-related cognitions are experienced very intensely. Only select this option if it is clear that the client is experiencing these cognitions very intensely through self-report, for example 80-100% intensity
2. Intense: trauma-related cognitions are experienced intensely. Select this option if the client reports experiencing these cognitions but they appear controllable in the session (e.g., 50-80% when the client is asked to rate the intensity).
3. Present, but not very intense: trauma-related cognitions are present in the description of how the client feels, but are experienced at a low level (e.g., less than 50% when the client is asked to rate).
4. Little or no intensity: the client does not access trauma-related cognitions during the session. It may be that the client does not express these cognitions, or that they report what they thought at the time but do not think that way now in the therapy room
5. Unclear / unknown

4. Re-scripting themes. Themes in this section refer to all parts of the session that involve working with new parts of the image. As a general rule, these themes refer to any work with the image following the point where change is introduced.

4.1. Departure from the original image.

4.1.1. Setting.

1. The whole of the image takes place in the original setting
2. Image begins in the original setting, but then moves to a new setting
3. The whole of the image takes place in a different setting
4. Unclear / unknown

4.1.2. When the re-script occurs.

1. A while before the intrusive image (please specify): a new image is created that, if real, would have occurred well before the original intrusive image. The original intrusive image is thus not part of the new image. For example, rather than going home and being assaulted, the client goes to visit a friend in the image, thus avoiding the assault
2. Immediately before the traumatic image: a new image is created that immediately precedes the original intrusive image. For example, the client brings people home with them to protect them from an impending assault
3. During the traumatic image: change in the image is introduced part way through the original intrusive image. For example, someone steps in at the moment where the client is about to be assaulted
4. Immediately after the traumatic image: change in the image is introduced immediately after the events in the original traumatic image. For example, an assault is included in the image, but the client is comforted afterwards
5. A while after the traumatic event (please specify): change in the image is introduced once the whole of the original traumatic image has been completed. For example, the client imagines going to the police days after the assault.

4.1.3. Amount of new image.

1. All new (e.g., safe place imagery): none of the original image is included in the re-script
2. Mostly new image, some old: only a small amount of the original intrusive image is incorporated into the re-script
3. Half original image, half new re-script: half of the new image incorporates old image, the remaining half involves new image
4. Mostly old image, some new: the majority of the image is taken up with the old intrusive image
5. No change from original (e.g., re-living only): there is no new image

4.2. Others in the re-script. 'Others' refers to any key people / figures who are present in the re-script, regardless of whether they are present during the original intrusive image or not. They do not have to be people. For example, if a pet plays a prominent role, include them in this section.

4.2.1. Individuals present in the re-script. Mark 'yes' by all that apply.

1. Perpetrator
2. Client as they were at the time of the image
3. Strangers
4. Family
5. Therapist
6. Client as adult / future self
7. Friends
8. Fictional character e.g., an angel
9. Other (please specify)

4.2.2. Individuals present in the re-script were present during the original intrusive image.

1. Yes: list all individuals who were present in the original intrusive image *and* are present in the re-script
2. No: list all individuals who were present in the original intrusive image *but* are present in the re-script
3. Unclear / unknown

4.2.3. Emotional reactions of each individual.

1. Specify: specify the key emotions expressed by each individual in the re-script

4.2.4. Actions of the individuals present. For each individual specify whether they do any of the following.

2. Protect client / take client to safety: does anyone physically protect the client? If so, who?
3. Attack / seek revenge: does anyone attack the perpetrator or seek revenge? If so, who?
4. Comfort / care for: does anyone emotionally comfort the client? If so, who?

5. Speak on behalf of / stand up for client: does anyone speak on behalf of the client or act as their ambassador? If so, who?
6. Berates the perpetrator: perpetrator is told what they did wrong, that they should be ashamed, etc.
7. Other (specify)

4.2.5. Presence of physical contact.

1. Yes: physical contact is present, for example in the form of physical comfort
2. No: there is no physical contact

4.2.6. Anything said by the individuals.

1. Yes: specify the key messages said by each individual. This can be a direct quote, or a summary of the main message the individual brings
2. No

4.2.7. Individual in the image who is responsible for change. Specify who of the following individuals is involved in bringing about change in the image. Include all who are relevant.

1. Perpetrator
2. Client as they were at the time of the image
3. Strangers
4. Family
5. Therapist
6. Client as adult / current self
7. Friends
8. Fictional character e.g., an angel
9. Other

4.3. Believability

4.3.1. The client has experienced something similar in real life.

1. Yes (exactly the same): the re-script is a repetition of a real even that happened in the client's past
2. Yes (similar): the re-script is related to an event from the client's past
3. No: the client has not experienced anything similar in their past
4. Unclear / unknown

4.3.2. The re-script feels believable to the client, regardless of whether it is physically possible.

1. Yes (feels as though it could have happened): the client describes the new outcome as feeling believable and as something that could have happened
2. No (feels very alien, can't connect): the client does not feel the new outcome is believable
3. Unclear / unknown

4.3.3. The re-script is an event that is physically possible given constraints of space and time.

1. Yes: the re-script is an event that could have happened given the constraints of space and time. For example, a neighbour heard the assault and called the police
2. No: the event is not possible given the constraints of space and time. For example, the client travels back in time to protect their past-self
3. Unclear / unknown

4.3.4. Part of the re-script can be used as practice for a potential future real world situation.

1. Yes: a part of the re-script can be used as practice for a future event. For example, the client is able to practice being assertive
2. No: no part of the image could be used in a real world situation
3. Unclear / unknown

4.4. Activation of internal processes during the re-script. These codes refer to emotions, physiological sensations and cognitions associated with the change in the image.

4.4.1. Emotions are present during the re-script.

1. Yes: the client accesses emotions during the re-scripted part of the image
2. No: the client does not access emotions during the re-scripted part of the image
3. Unclear / unknown

4.4.2. Type of emotions present during the re-script.

1. All positive: all original emotions experienced during the session are positive
2. Mainly positive: most original emotions experienced during the session are positive
3. Mixed: original emotions experienced during the session are both positive and negative
4. Mainly negative: original emotions experienced during the session are mainly negative
5. All negative: all original emotions experienced during the session are negative
6. Unclear/unknown
7. Specify which emotions are present during the re-scripted part of the image

4.4.3. Intensity of the emotional response during the re-script.

1. Very intense: emotions are experienced very intensely. Only select this option if it is clear that the client is experiencing these emotions very intensely through self-report, for example if they report 80-100% intensity
2. Intense: emotions are experienced intensely. Select this option if the client reports experiencing these emotions but they appear controllable in the session, for example if they report 50-80% intensity.
3. Present, but not very intense: emotions are present in the description of how the client feels, but are experienced at a low level, for example, client reports less than 50% intensity

4. Little or no intensity: the client does not access emotions during the session. It may be that the client does not express these emotions, or that they report what they thought at the time but do not feel that way now in the therapy room
5. Unclear / unknown

4.4.4. Emotions have shifted from those present in the original image.

1. Yes (specify):there has been a change from the emotion that was initially activated when the intrusive image was brought to mind
2. No: there has been no change in emotion from that associated with the original intrusive image
3. Unclear / unknown

4.4.5. Humour is used.

1. Yes: the client finds the change humorous
2. No: the client does not find the change humorous
3. Unclear / unknown

4.4.6. Physiological sensations are present during the re-script.

1. Yes: the client accesses physiological sensations during the re-scripted part of the image
2. No: the client does not access physiological sensations during the re-scripted part of the image
3. Unclear / unknown
4. Specify all physiological sensations present during the re-script

4.4.7. Intensity of the physiological response during the re-script.

1. Very intense: physiological sensations are experienced very intensely. Only select this option if it is clear that the client is experiencing these physiological sensations very intensely through self-report, for example if they report 80-100% intensity
2. Intense: physiological sensations are experienced intensely. Select this option if the client reports experiencing these physiological sensations but they appear controllable in the session, for example if they report 50-80% intensity.
3. Present, but not very intense: physiological sensations are present in the description of how the client feels, but are experienced at a low level, for example, client reports less than 50% intensity
4. Little or no intensity: the client does not access physiological sensations during the session. It may be that the client does not express these physiological sensations, or that they report what they thought at the time but do not feel that way now in the therapy room
5. Unclear / unknown

4.4.8. Physiological sensations have shifted from those present in the original image.

1. Yes (specify):there has been a change from the physiological sensation that was initially activated when the intrusive image was brought to mind
2. No: there has been no change in physiological sensation from that associated with the original intrusive image
3. Unclear / unknown

4.4.9. Cognitions are present during the re-script.

1. Yes: the client accesses cognitions during the re-scripted part of the image
2. No: the client does not access cognitions during the re-scripted part of the image
3. Unclear / unknown
4. Specify all cognitions present during the re-script

4.4.10. Intensity of the cognitions present during the re-script.

1. Very intense: cognitions are experienced very intensely. Only select this option if it is clear that the client is experiencing these cognitions very intensely through self-report, for example if they report 80-100% intensity
2. Intense: cognitions are experienced intensely. Select this option if the client reports experiencing these cognitions but they appear controllable in the session, for example if they report 50-80% intensity.
3. Present, but not very intense: cognitions are present in the description of how the client feels, but are experienced at a low level, for example, client reports less than 50% intensity
4. Little or no intensity: the client does not access cognitions during the session. It may be that the client does not express these cognitions, or that they report what they thought at the time but do not think that way now in the therapy room
5. Unclear / unknown

4.4.11. Cognitions have shifted from those present in the original image

1. Yes (please specify): there has been a change from the cognition that was initially activated when the intrusive image was brought to mind
2. No: there has been no change in cognition from that associated with the original intrusive image
3. Unclear / unknown

5. Outcome. Themes in this section refer to the very end of the ImRs session.

5.1. Definition of the outcome.

5.1.1. The final outcome. This code refers to the overall outcome of the re-script. It is likely that a number of changes will have occurred during the image. This theme should capture the broad outcome themes, rather than identifying every change that is introduced into the image.

1. Protect client: client is protected at the original scene
2. Take client to safety: client is taken away from the scene
3. Attack / seek revenge: perpetrator is attacked or revenge is sought
4. Comfort / care for: client is comforted or looked after
5. Speak on behalf of / stand up for client: someone speaks on behalf of the client and stands up for their rights or beliefs
6. Berates the perpetrator: perpetrator is told what they did wrong, that they should be ashamed, etc.
7. Other (specify)

5.1.2. The outcome is as it was intended at the beginning.

1. Yes: the outcome is exactly as was intended in the pre-imagery phase of the session
2. No: the outcome is not the same as was intended in the pre-imagery phase of the session
3. In part: part of the outcome was as was intended in the pre-imagery phase of the session, part was different
4. Unclear / unknown
5. Not applicable: there was no pre-agreed aim

5.1.3. The outcome meets a previously unmet need.

1. Yes (please specify): the client feels that they have had their needs met
2. Some are, not all: the client feels that some of their needs have been met, but additional needs still need meeting
3. No: no needs have been met

5.2. Attitude towards the outcome.

5.2.1. The final message taken from the re-script.

1. Positive: the client feels positively towards the new image
2. Negative: the client feels negatively towards the new image
3. Neutral: the client does not feel positively or negatively towards the new image
4. Unclear / unknown
5. Specify: summarise the client's attitude towards the new image, for example, 'I know see it wasn't my fault'

5.2.2. The original meaning associated with the traumatic image has changed.

1. Yes: the client now feels differently towards the original image
2. No: the client feels the same towards the image now as they did at the beginning of the image
3. In part: there has been some change in the client's attitude towards the original image
4. Unclear / unknown

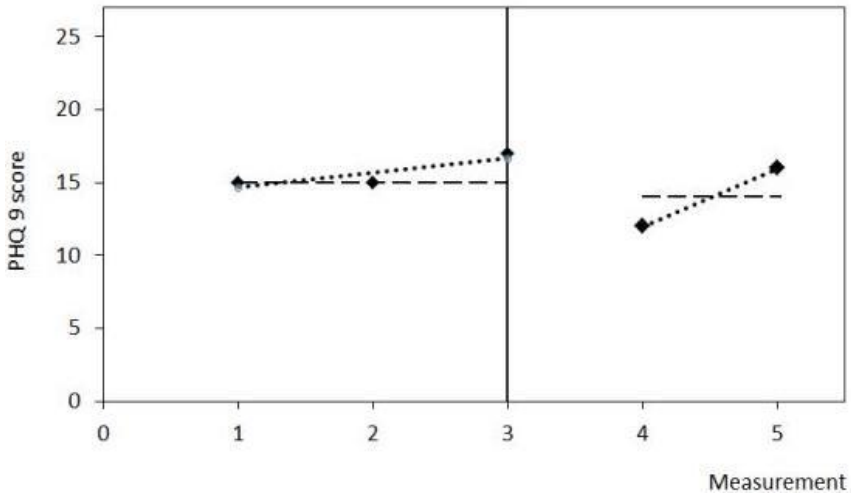
5.2.3. The final emotion is positive.

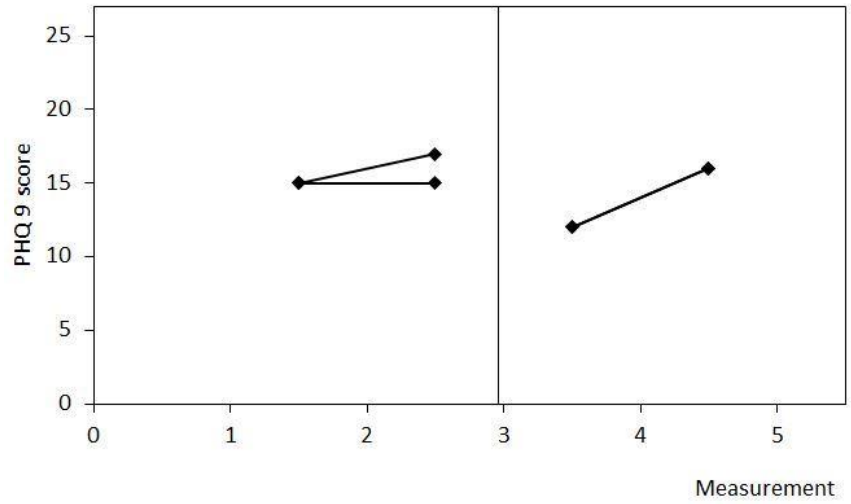
1. Yes: the client feels good following ImRs
2. No: the client does not feel good following ImRs
3. Unclear / unknown

5.2.4. Expectedness of the outcome

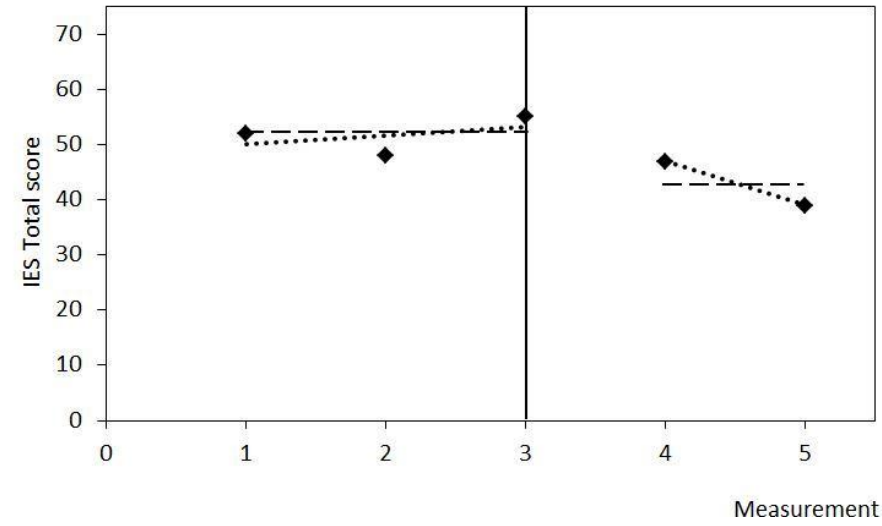
1. Client is surprised at the outcome: the client did not expect some part of the change. For example, they did not think change would be possible, or they did not think they would feel differently
2. Client expected the outcome: the client was not surprised by any part of the re-scripting process
3. Unclear / unknown
4. Other (please specify)

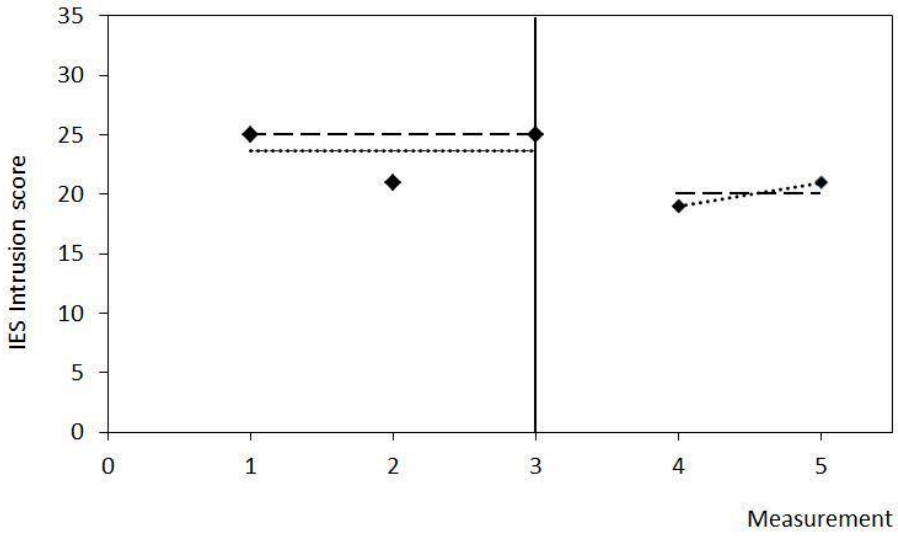
Appendix 15. P1's Trend, Central Location and Variability Analysis (Trended Range) of PHQ-9 Scores.

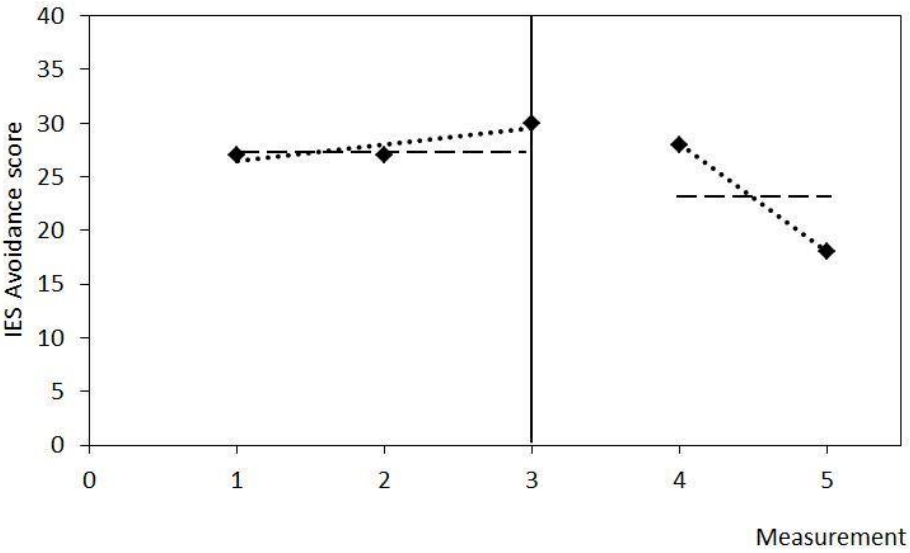




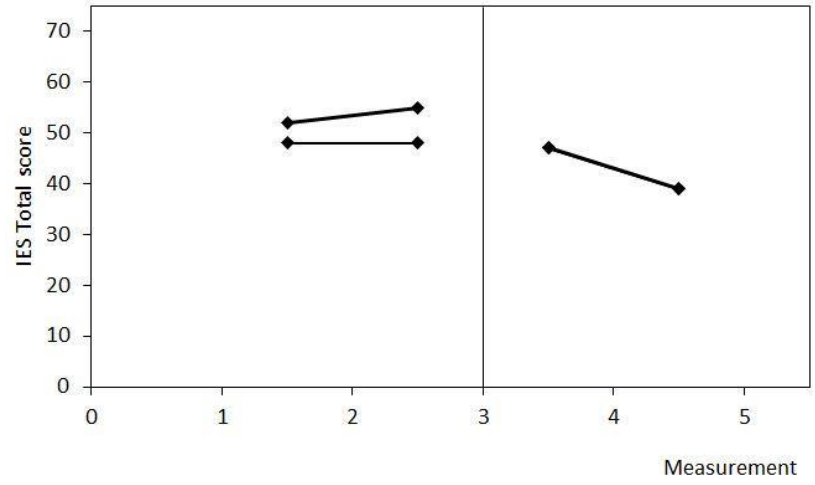
Appendix 16. P1's Trend and Central Location of IES Scores

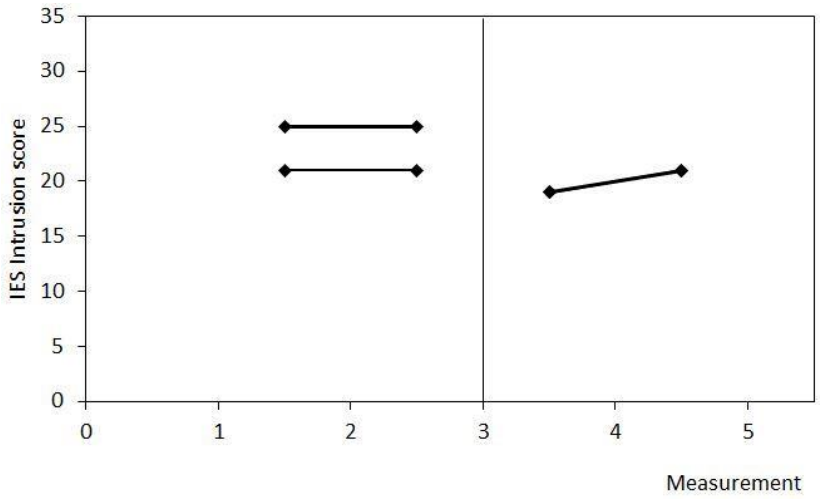


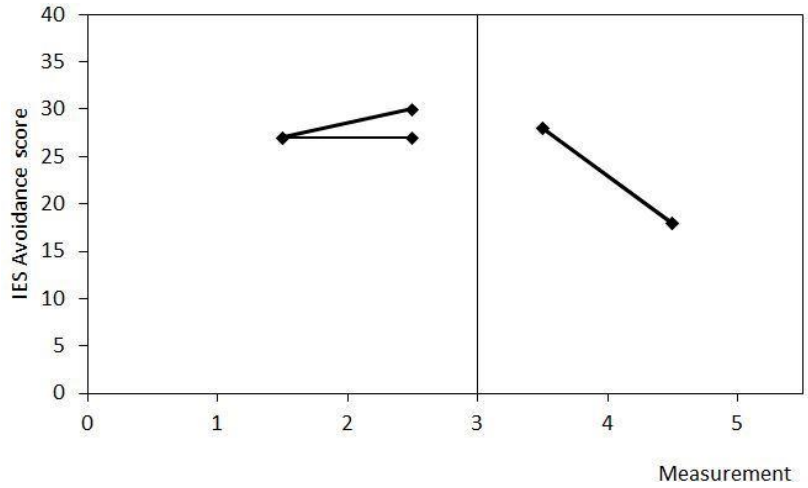




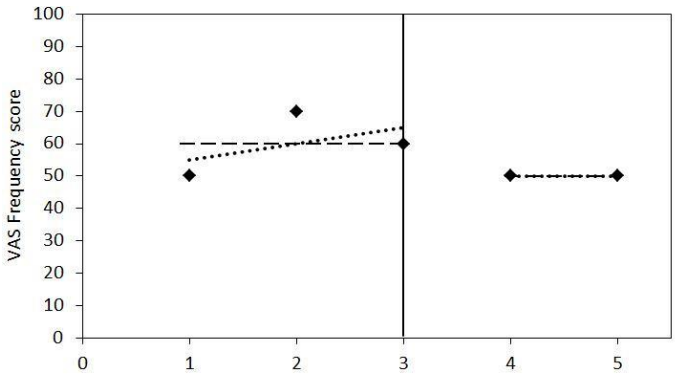
Appendix 17. P1's Variability Analysis (Trended Range) of IES Scores

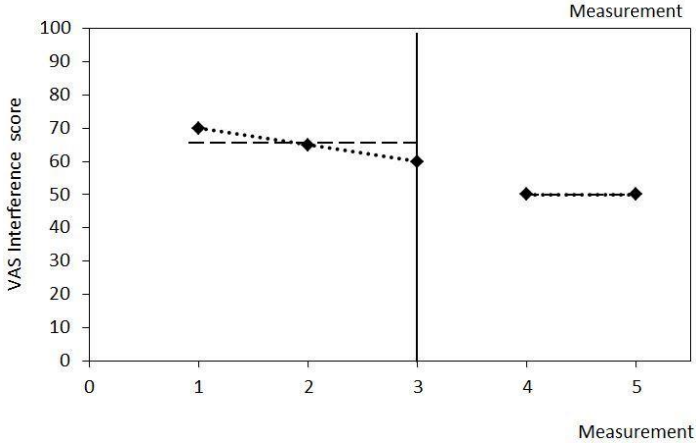


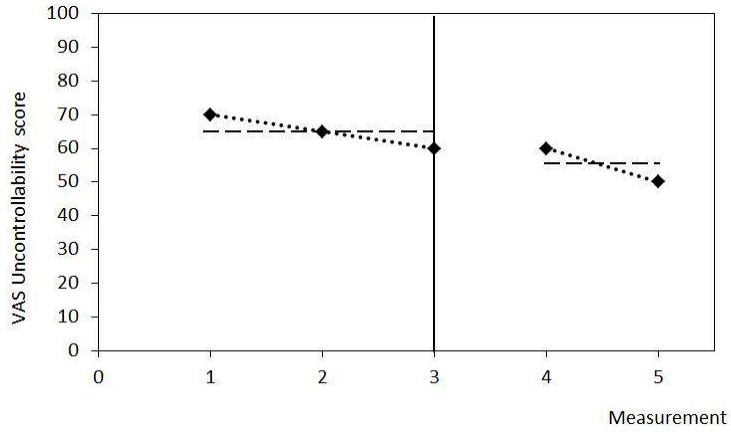


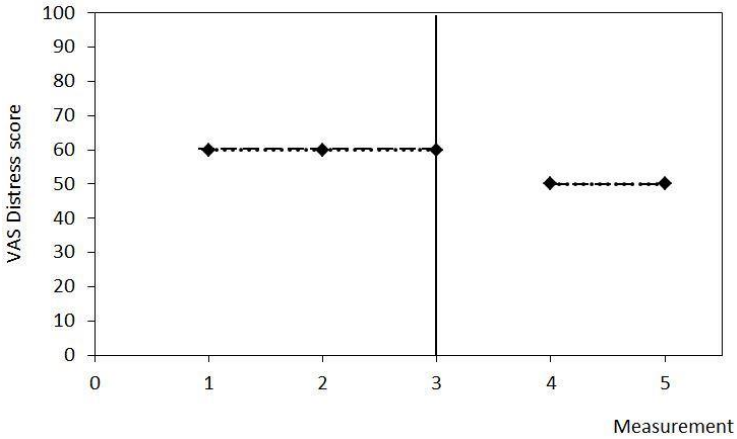


Appendix 18. P1's Trend and Central Location of VAS Scores

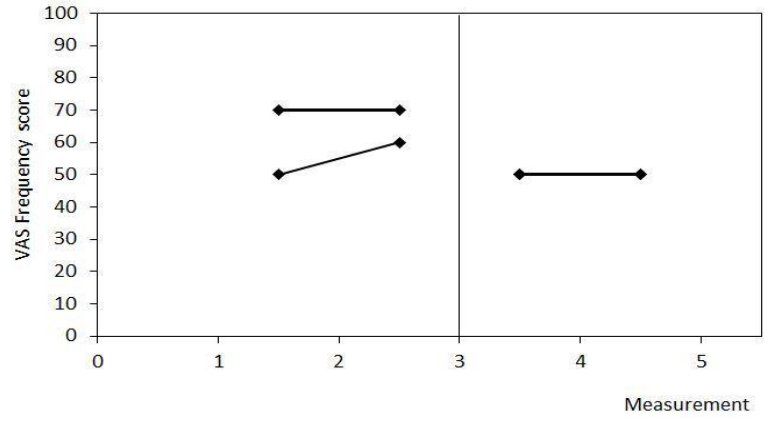


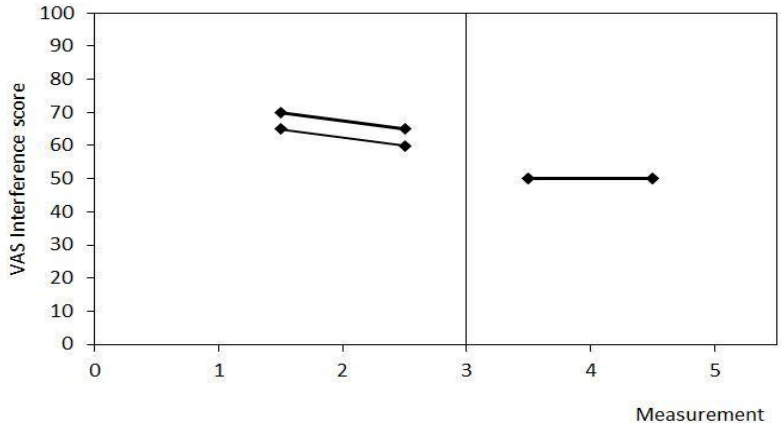


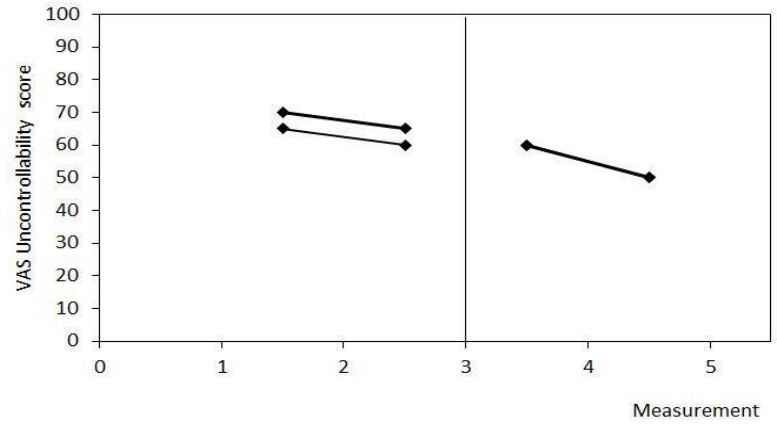


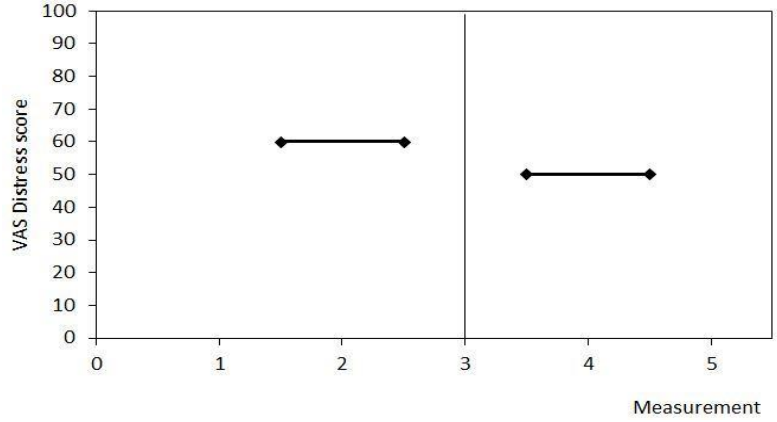


Appendix 19. P1's Variability Analysis (Trended Range) of VAS Scores

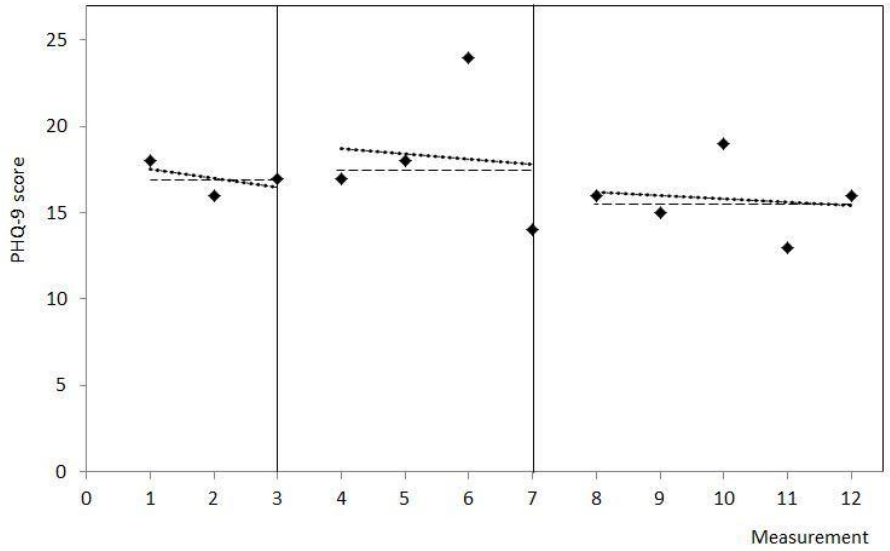


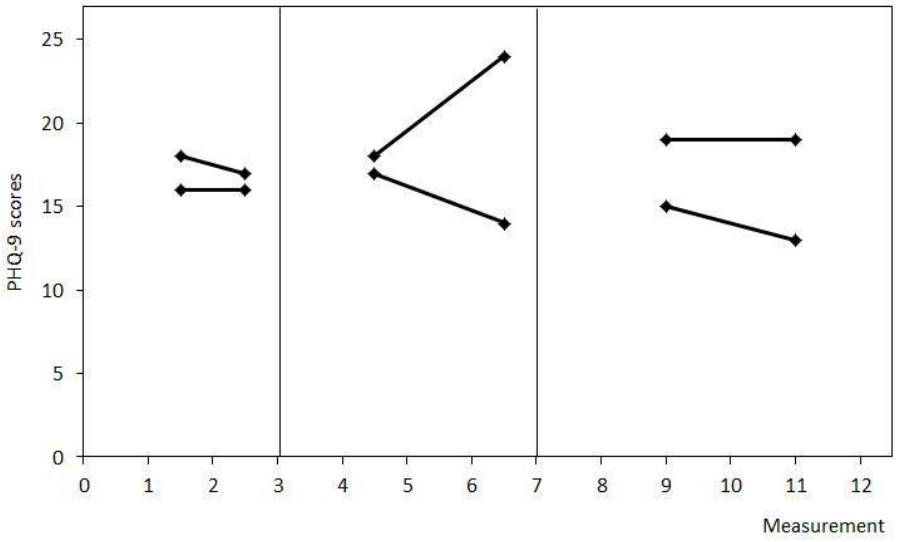




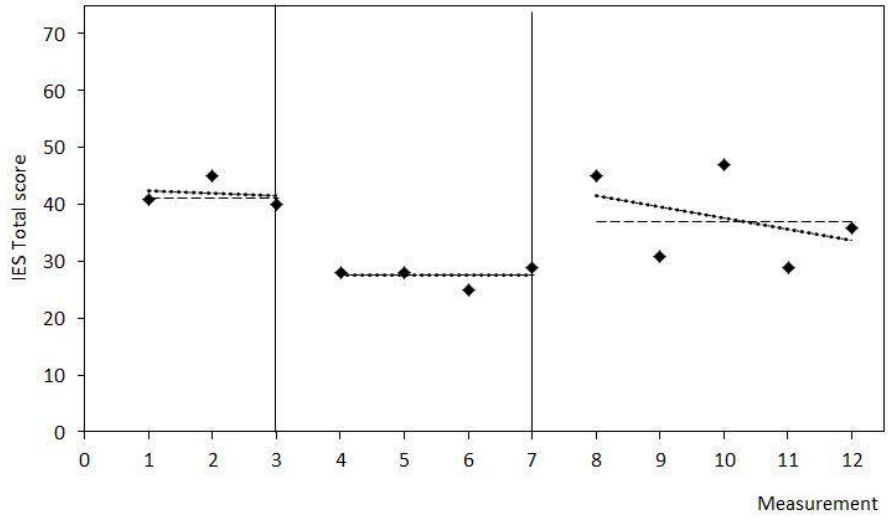


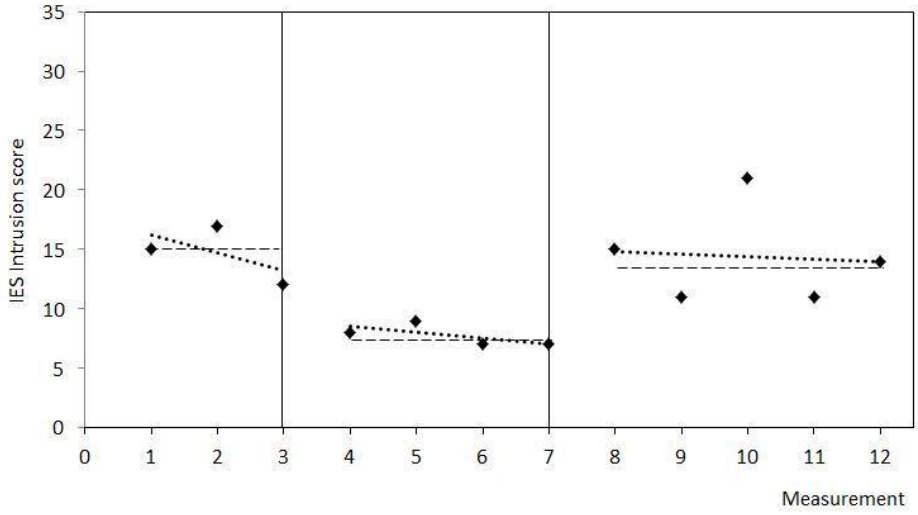
Appendix 20. P2's Trend, Central Location and Variability Analysis (Trended Range) of PHQ-9 scores

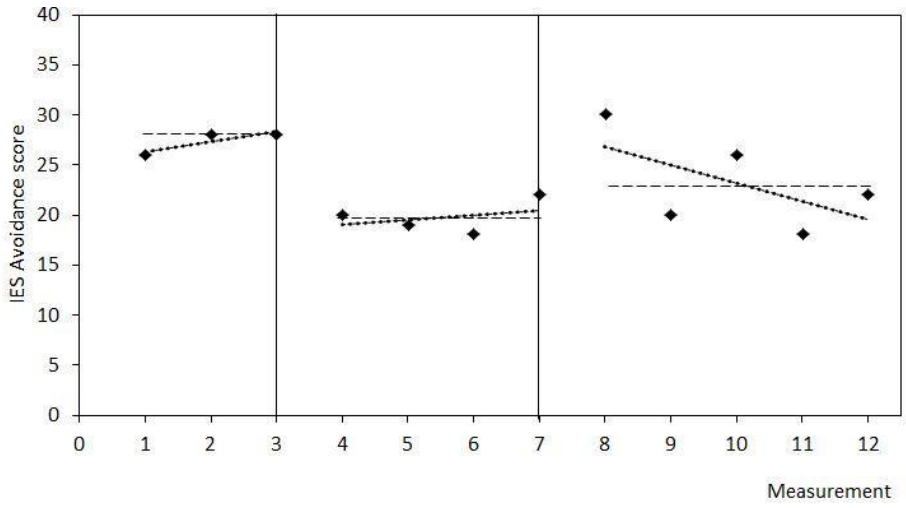




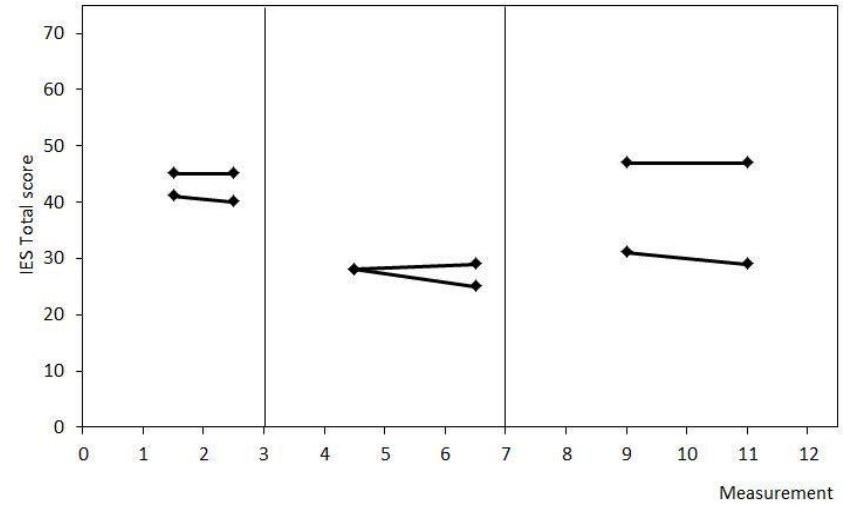
Appendix 21. P2's Trend and Central Location of IES Scores

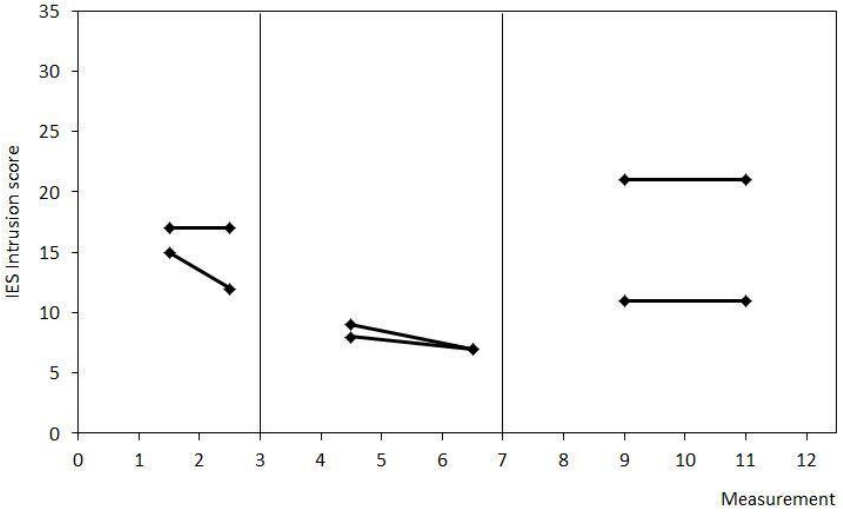


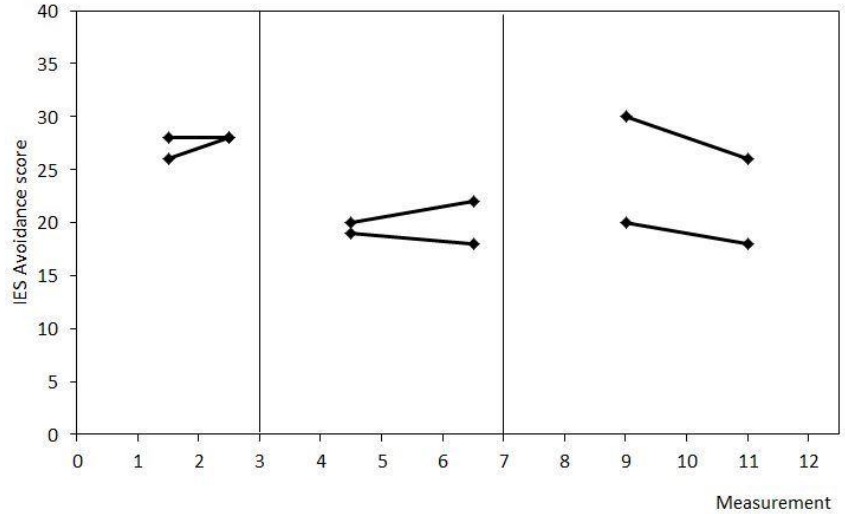




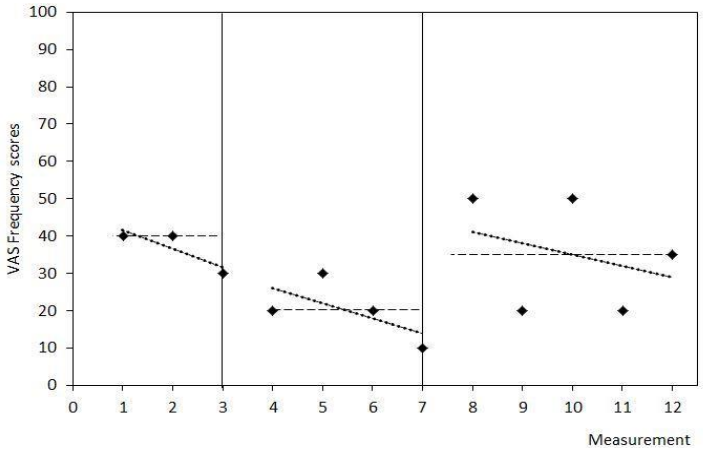
Appendix 22. P2's Variability Analysis (Trended Range) of IES Scores

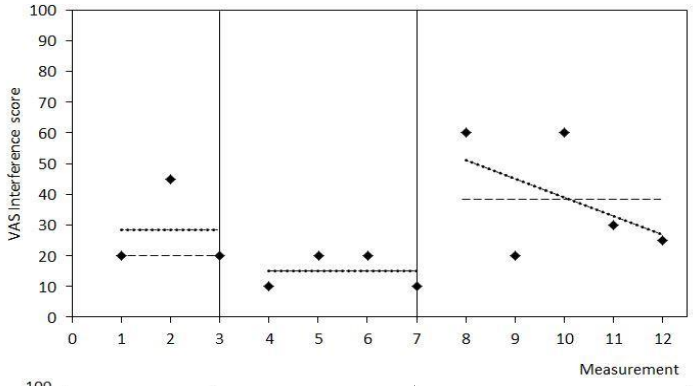


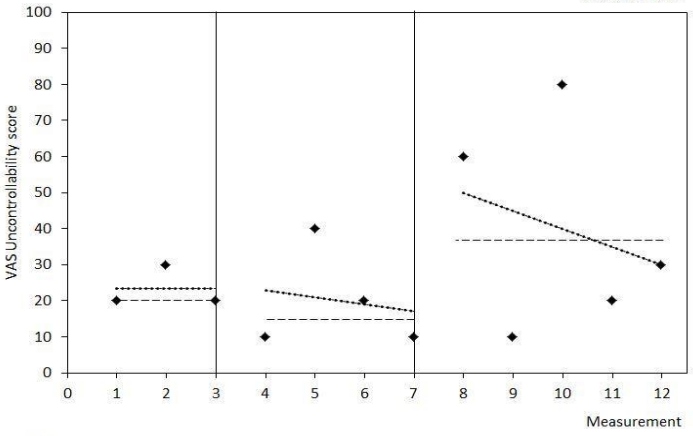


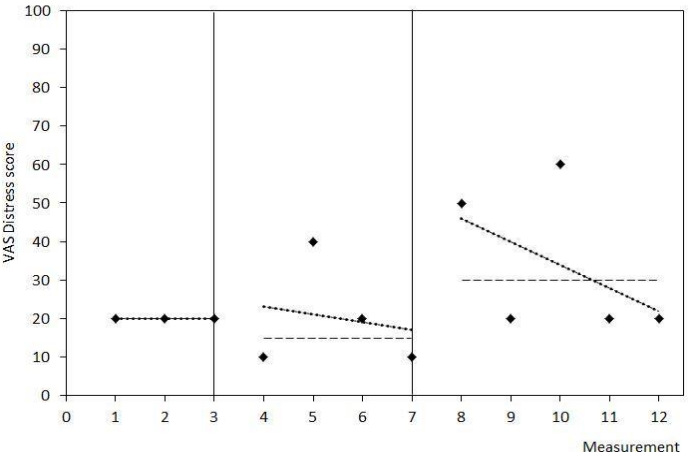


Appendix 23. P2's Trend and Central Location of VAS Scores

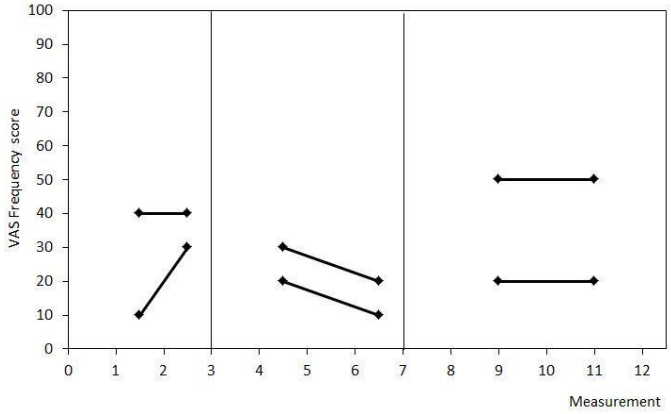


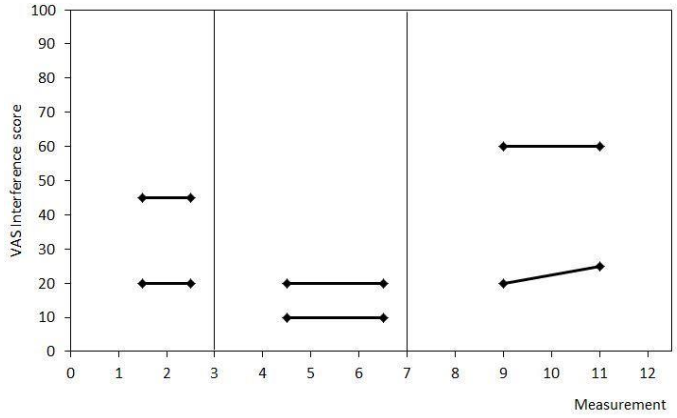


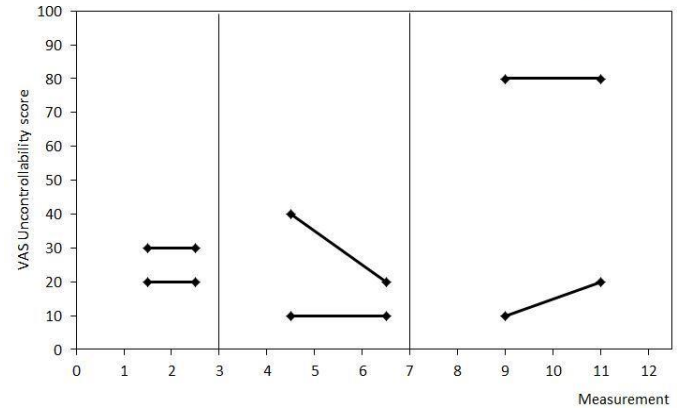


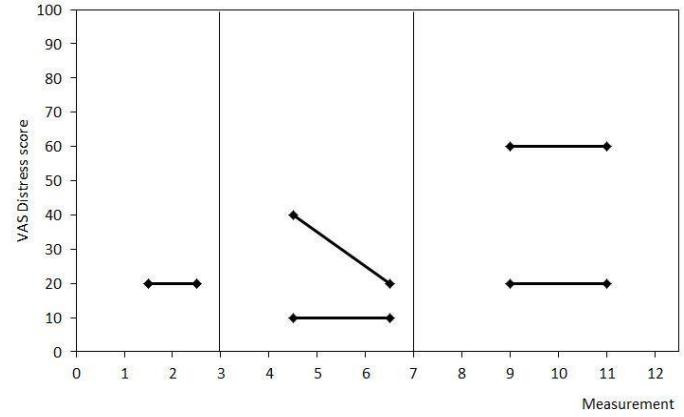


Appendix 24. P2's Variability Analysis (Trended Range) of VAS Scores

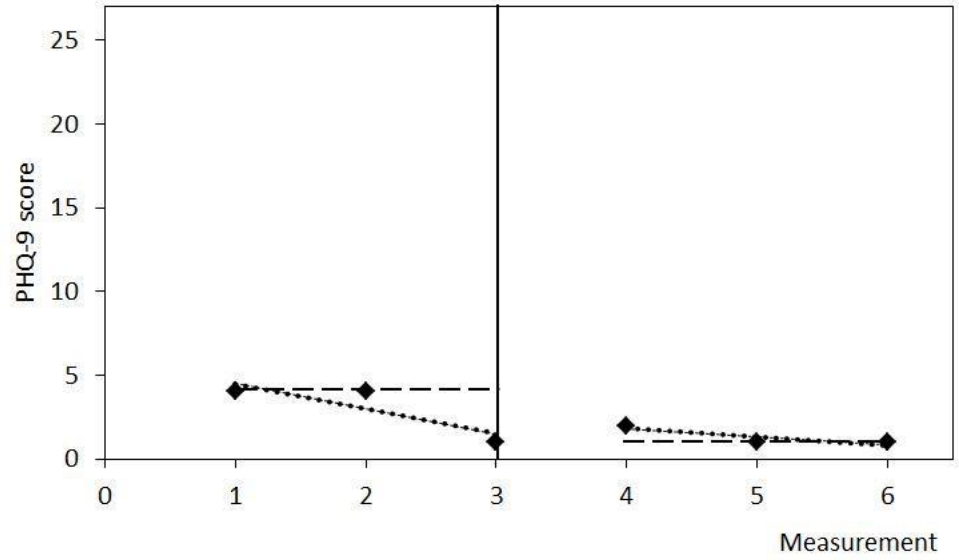


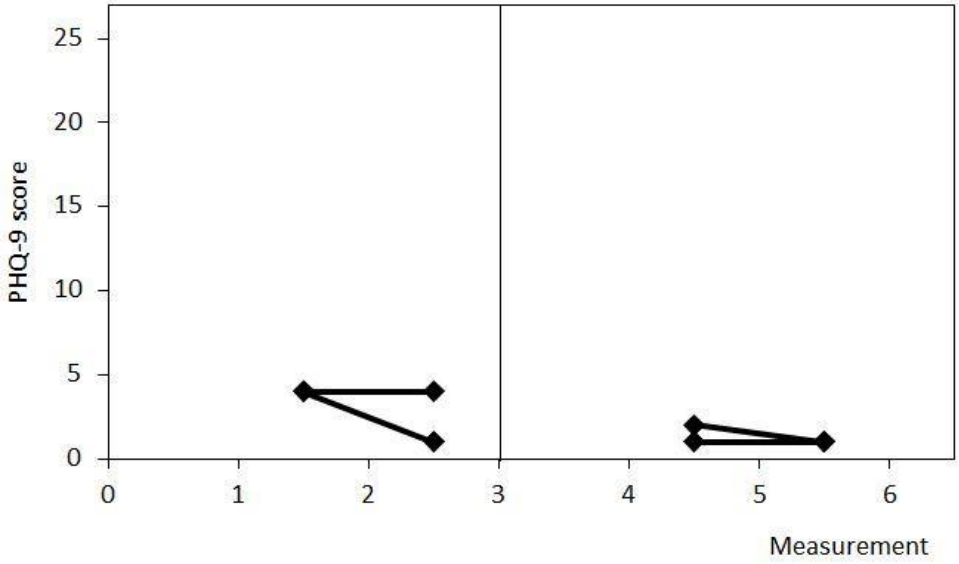




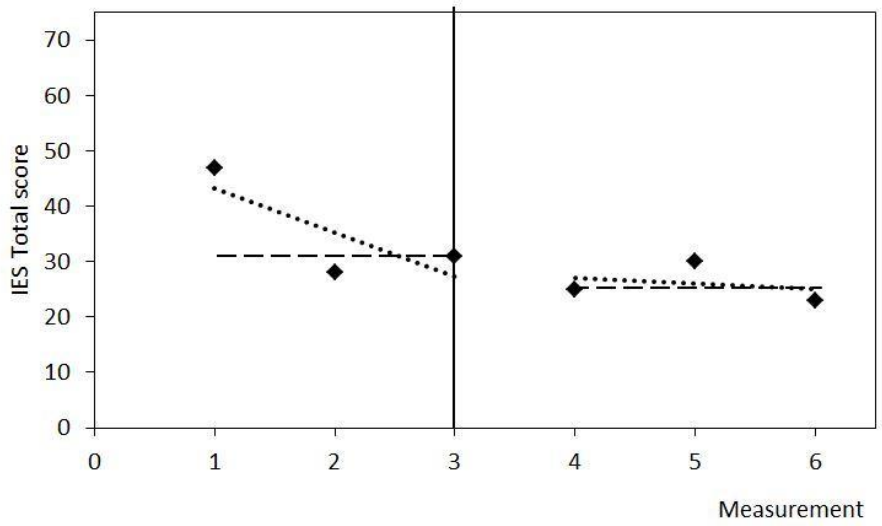


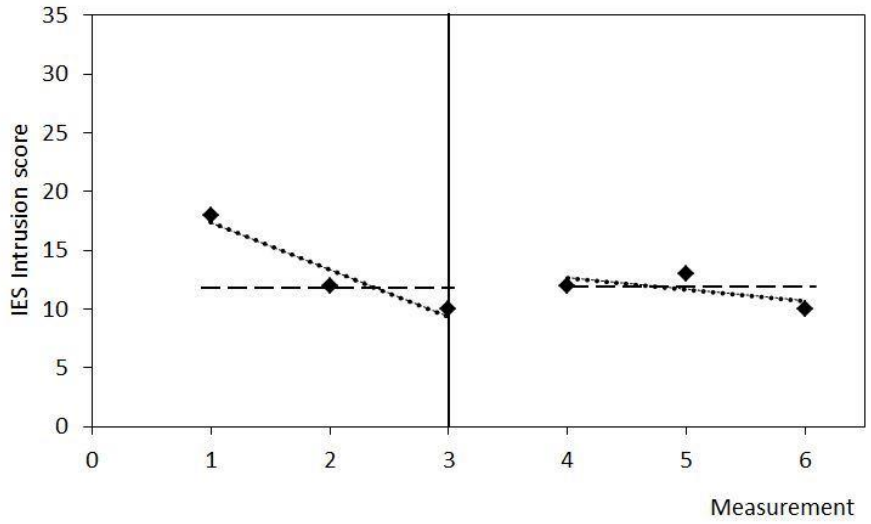
Appendix 25. P3's Trend, Central Location and Variability Analysis (Trended Range) of PHQ-9 scores

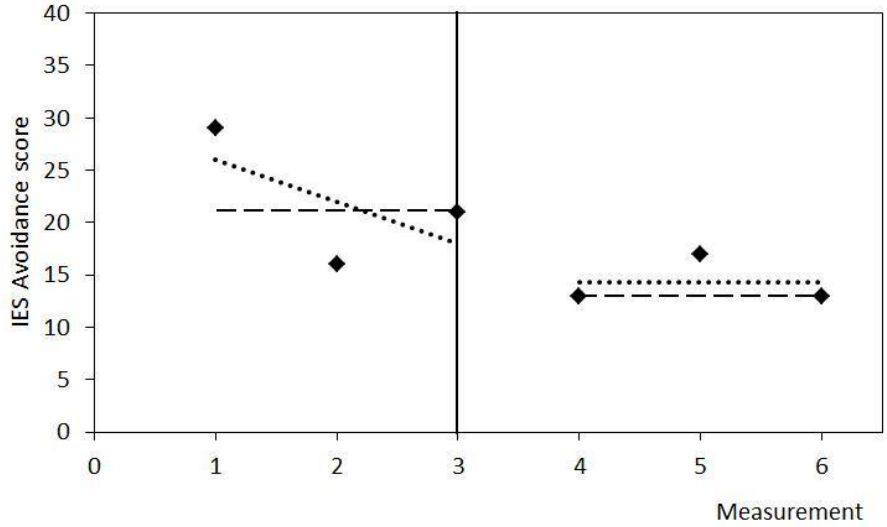




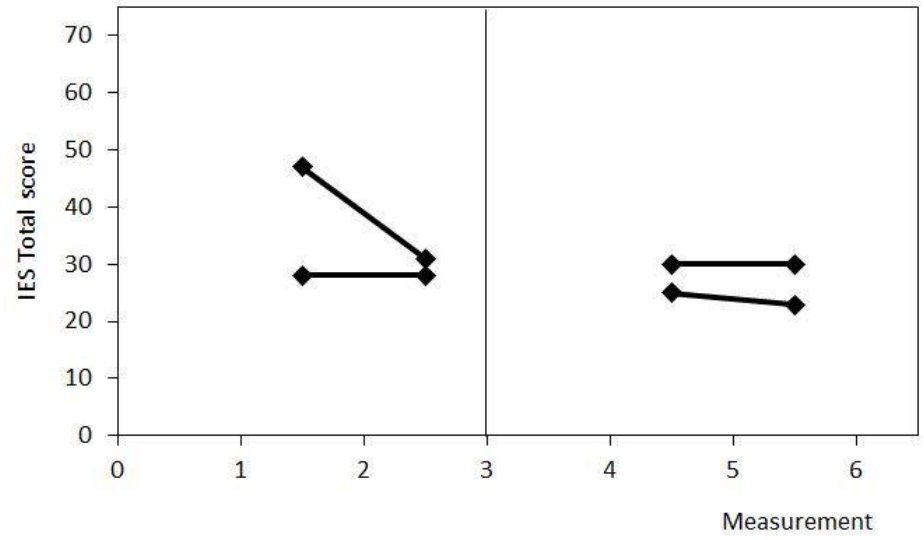
Appendix 26. P3's Trend and Central Location of IES Scores

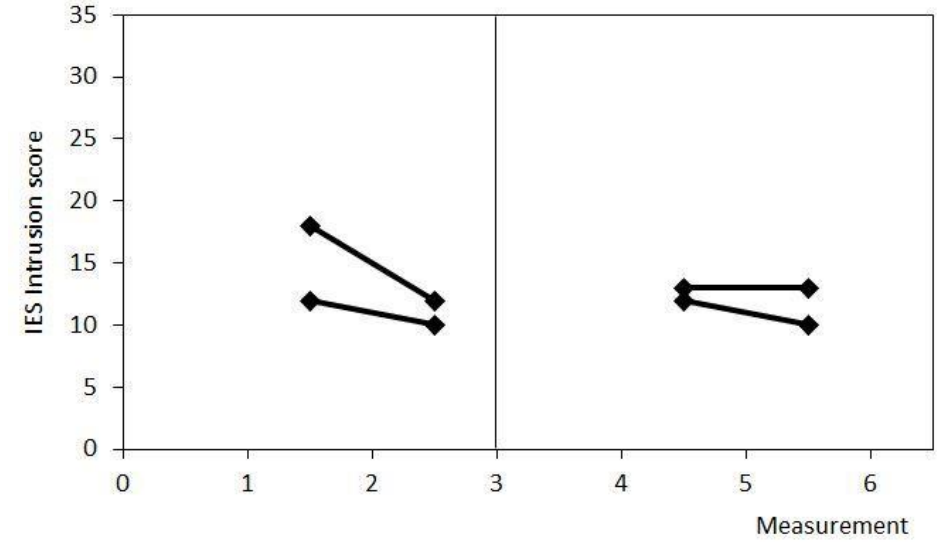


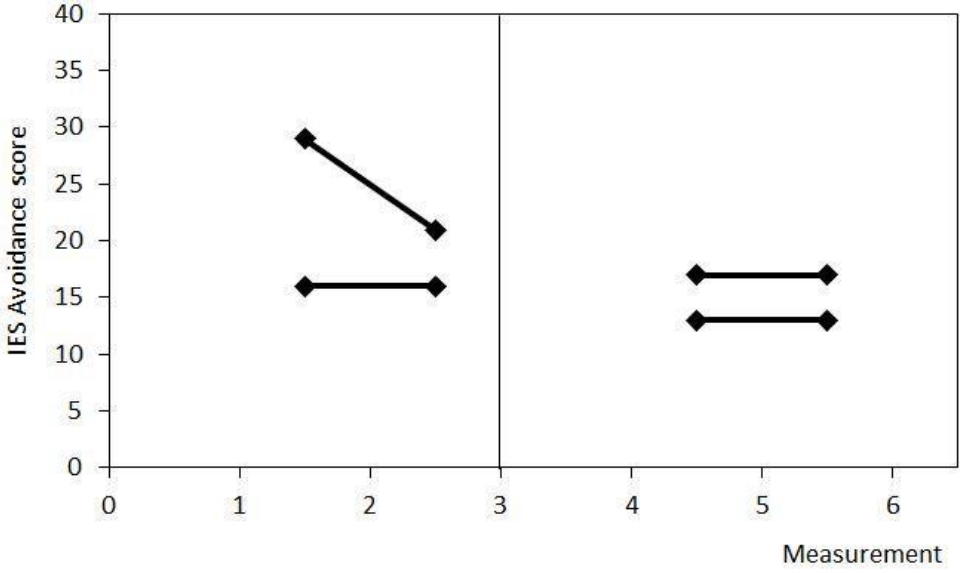




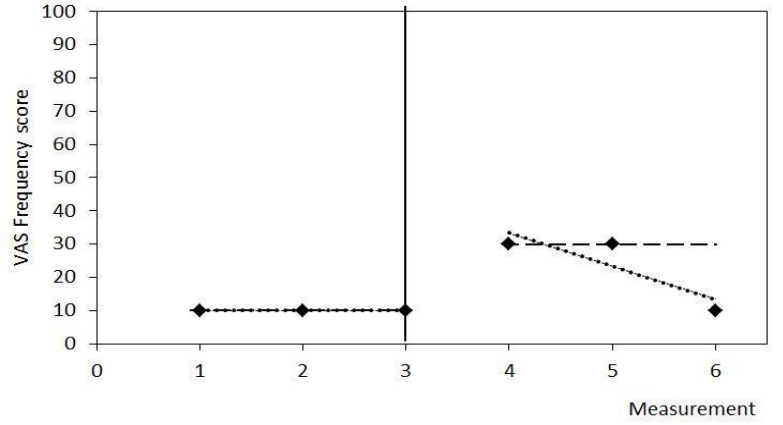
Appendix 27. P3's Variability Analysis (Trended Range) of IES Scores

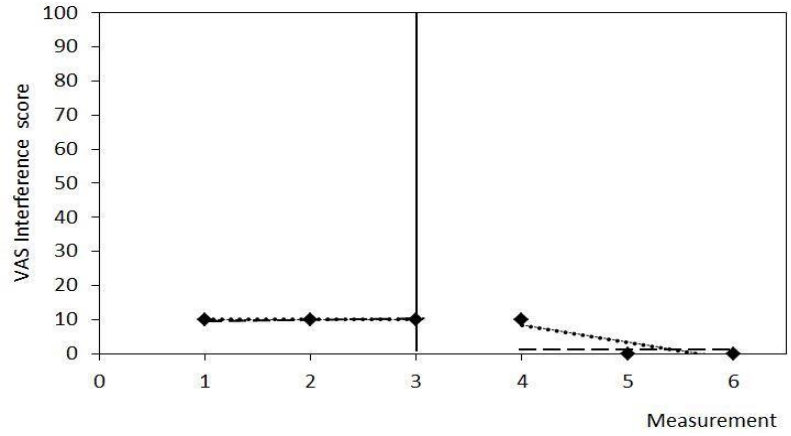


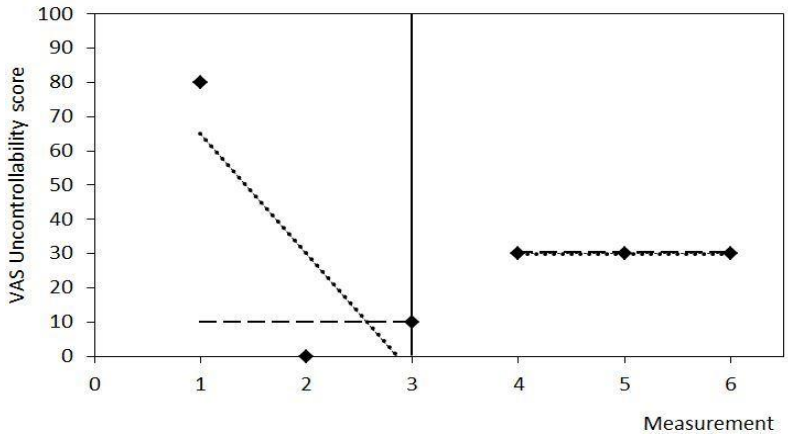


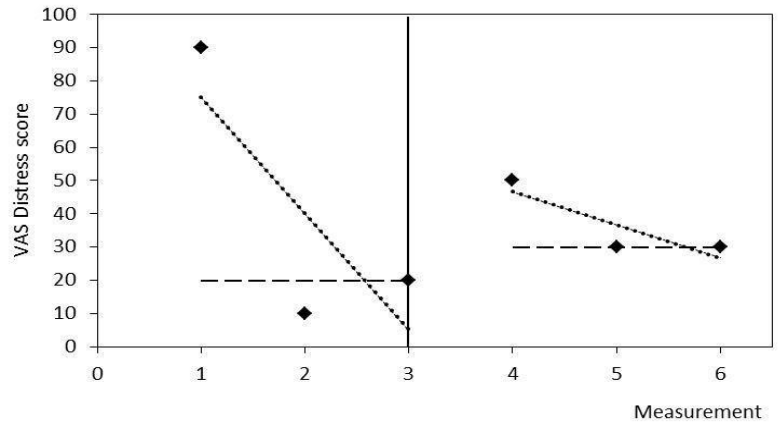


Appendix 28. P3's Trend and Central Location of VAS Scores

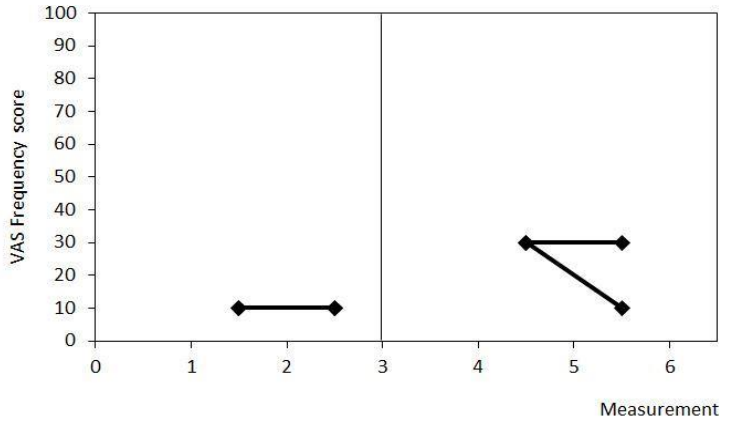


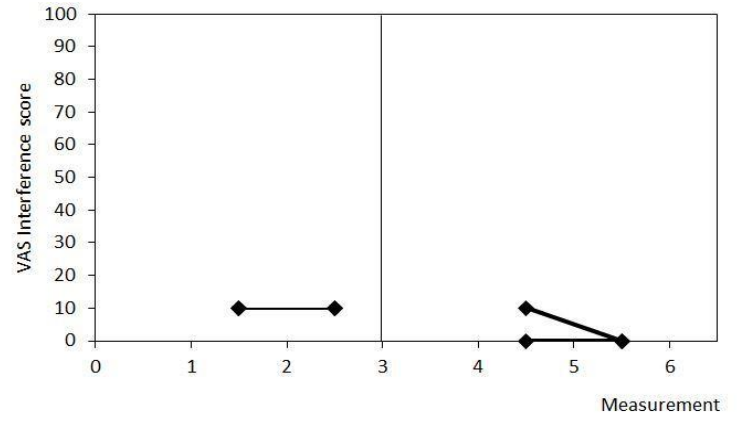


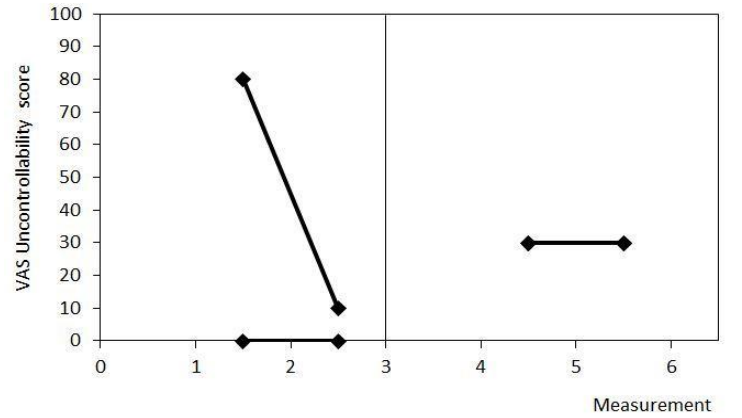


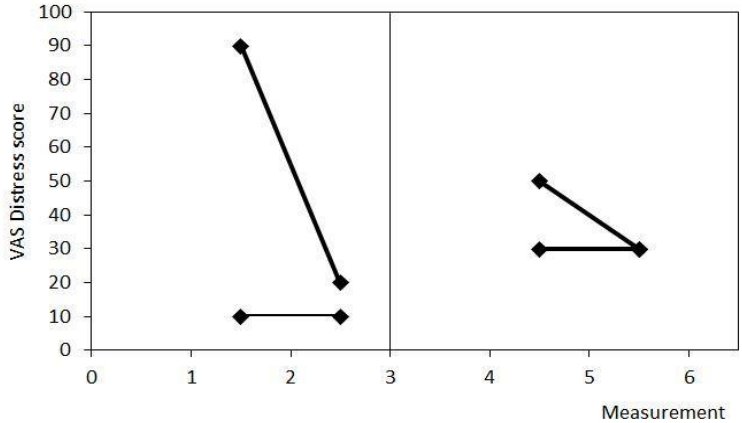


Appendix 29. P3's Variability Analysis (Trended Range) of VAS Scores

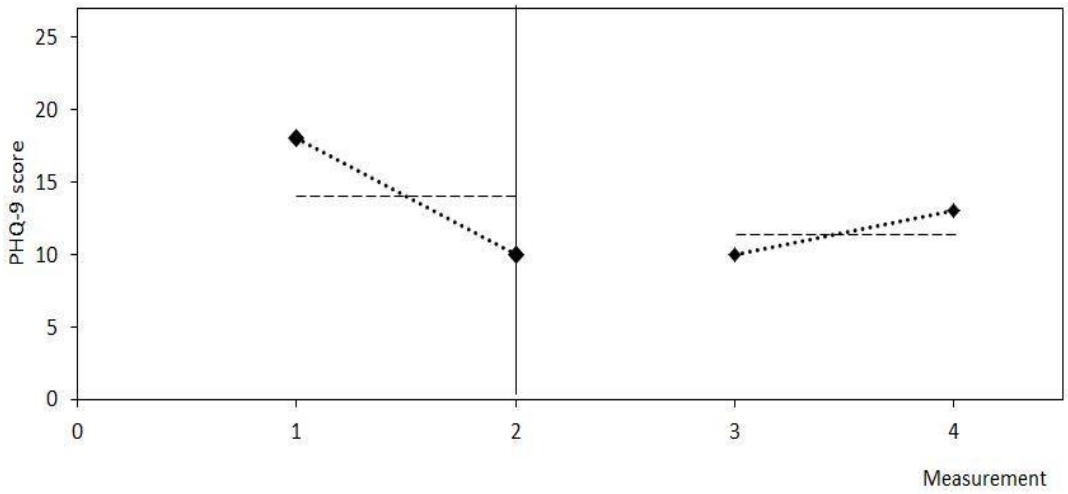




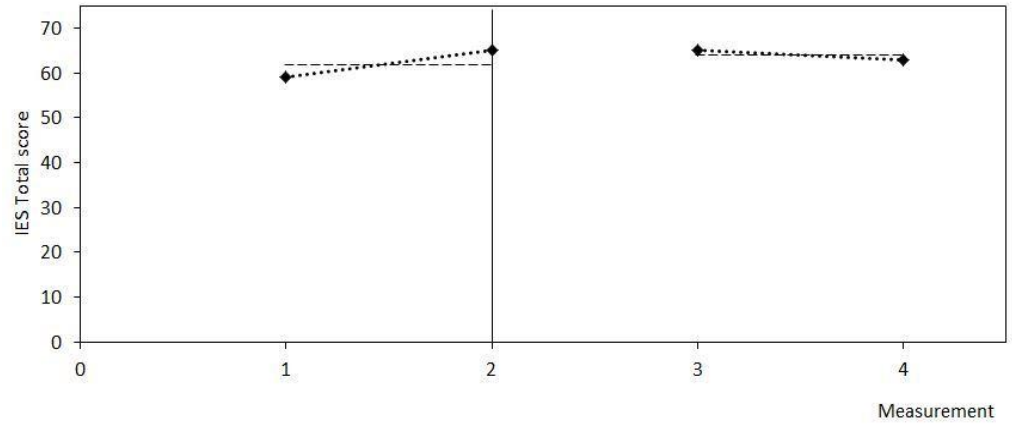


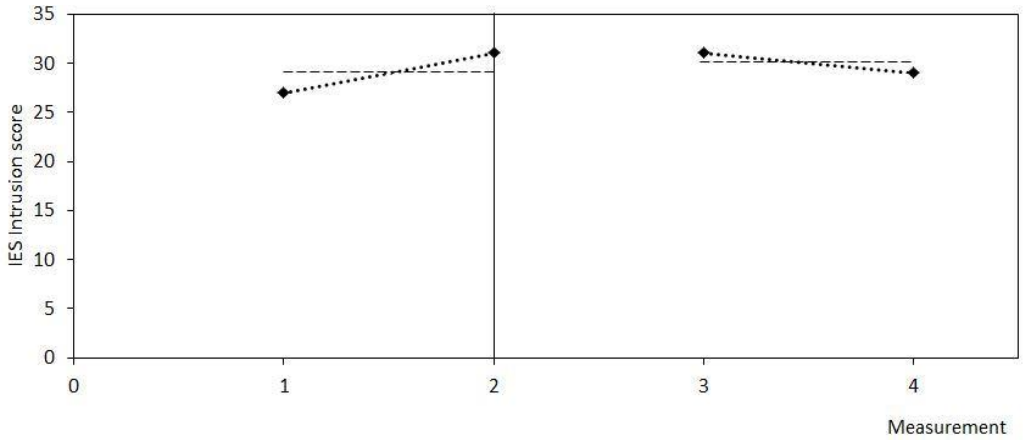


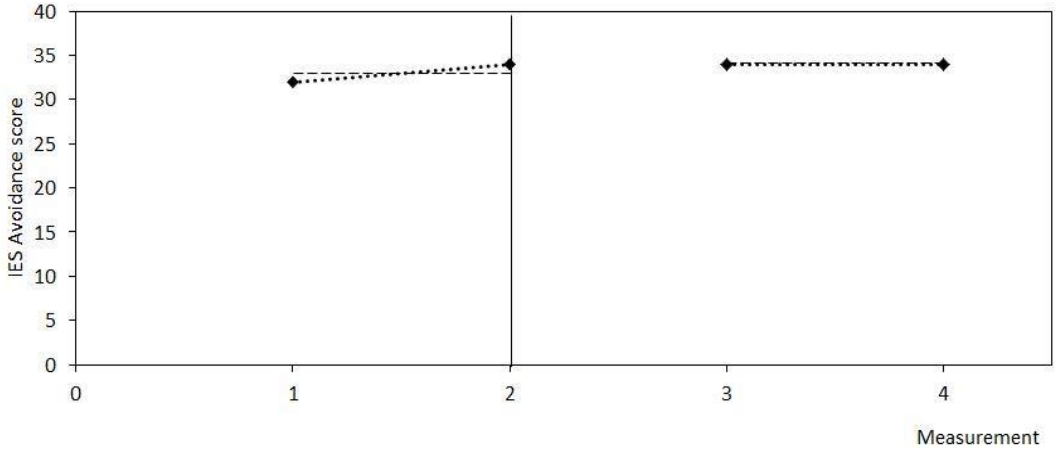
Appendix 30. P4's Trend and Central Location of PHQ-9 Scores



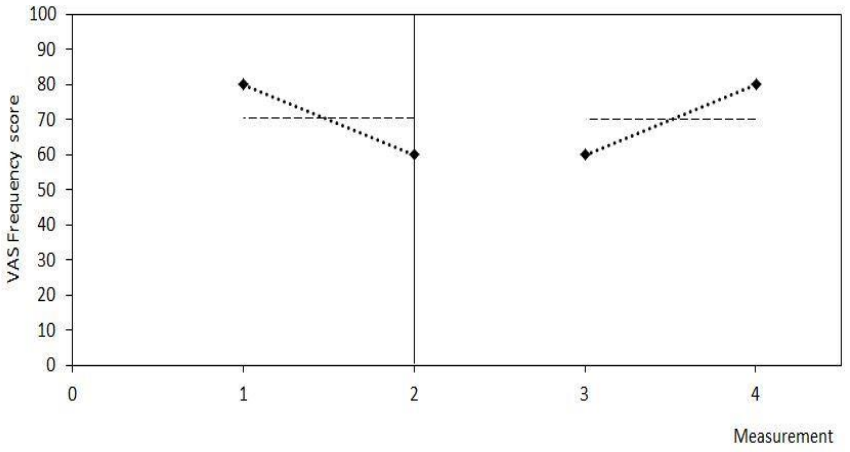
Appendix 31. P4's Trend and Central Location of IES Scores

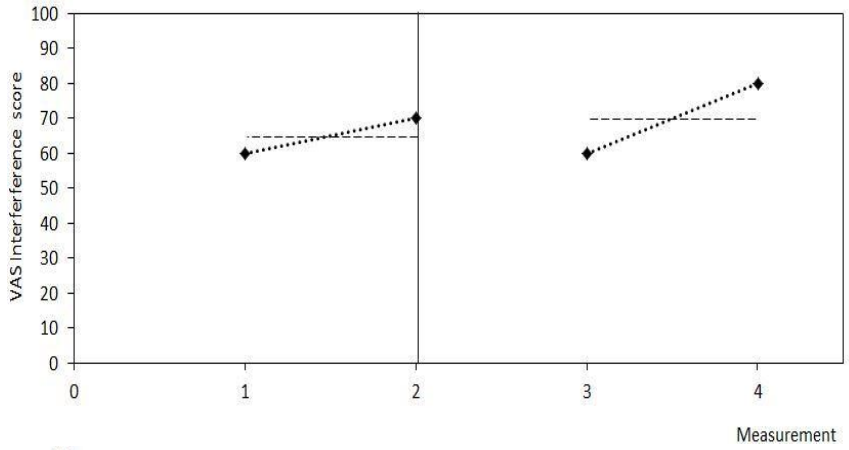


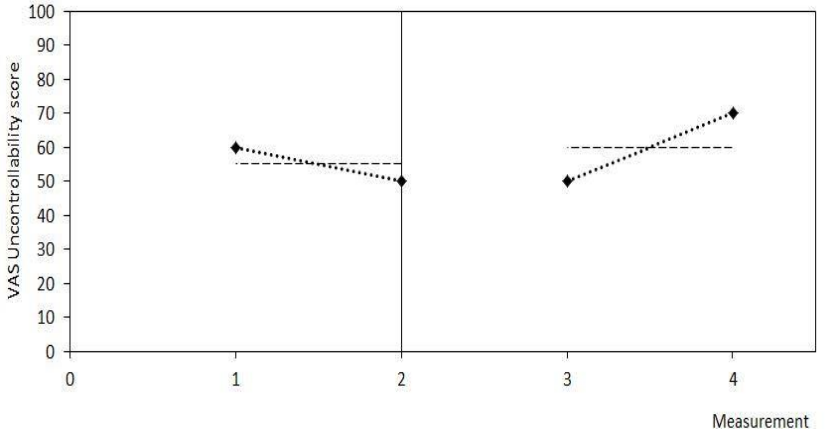


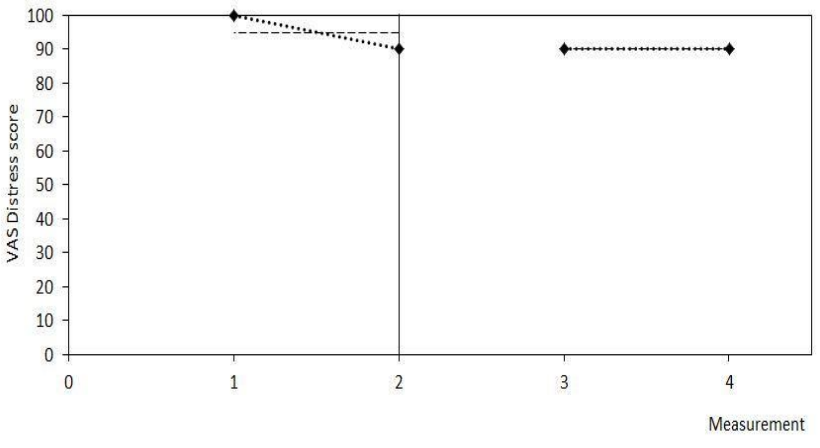


Appendix 32. P4's Trend and Central Location of VAS Scores

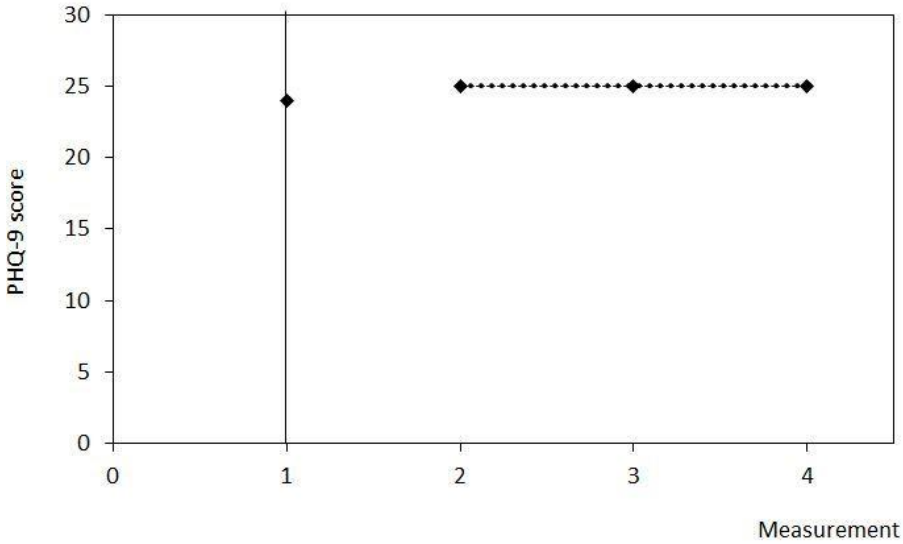


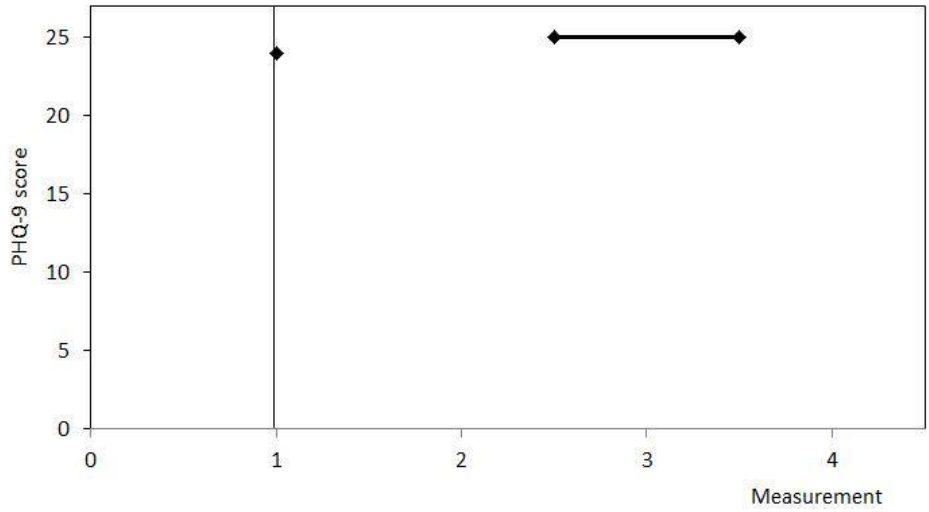




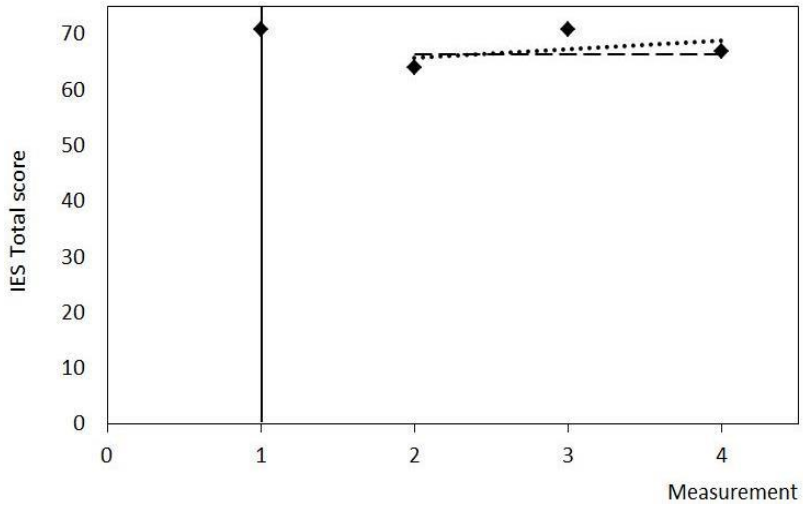


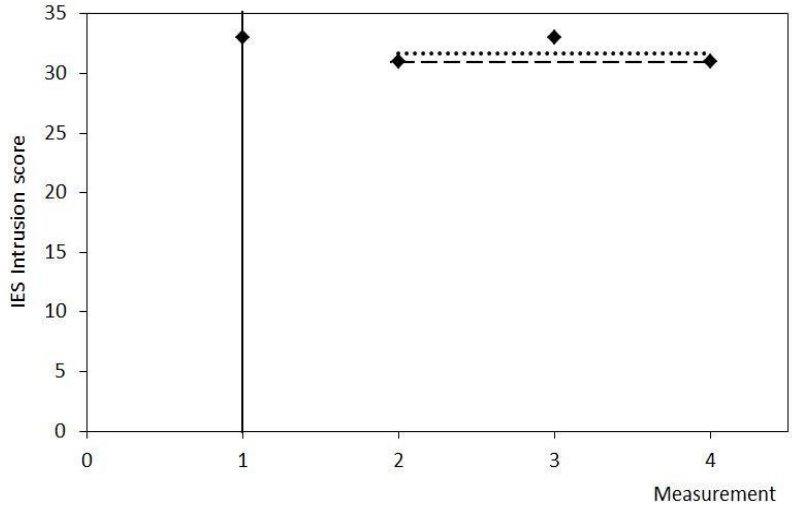
Appendix 33. P5's Trend, Central Location and Variability Analysis (Trended Range) of PHQ-9 Scores

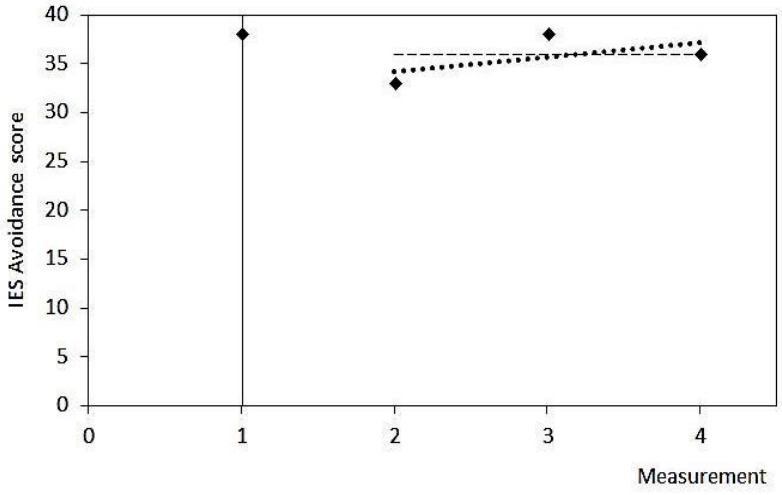




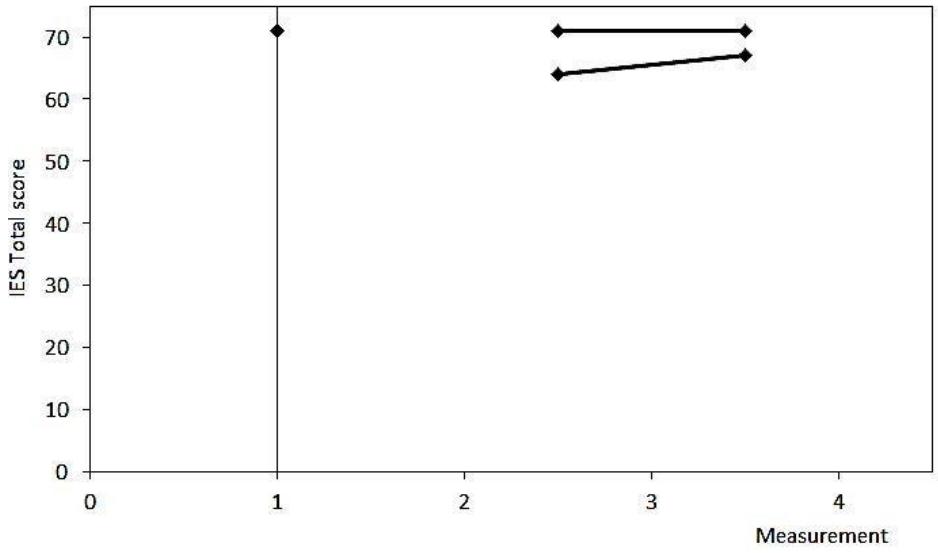
Appendix 34. P5's Trend and Central Location of IES Scores

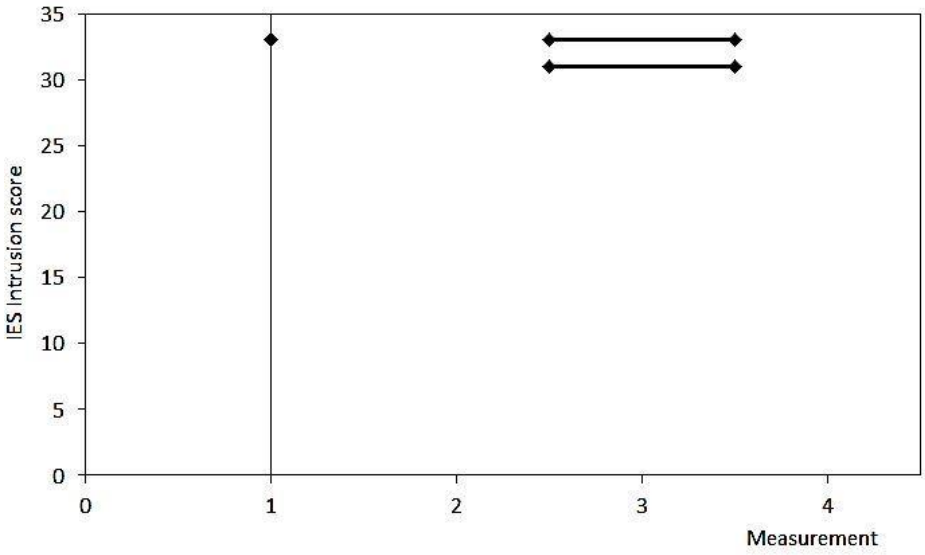


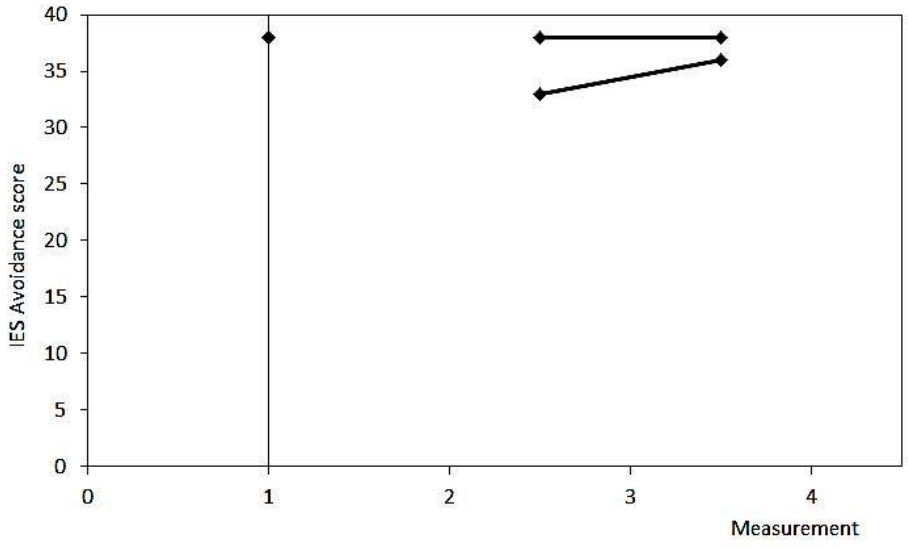




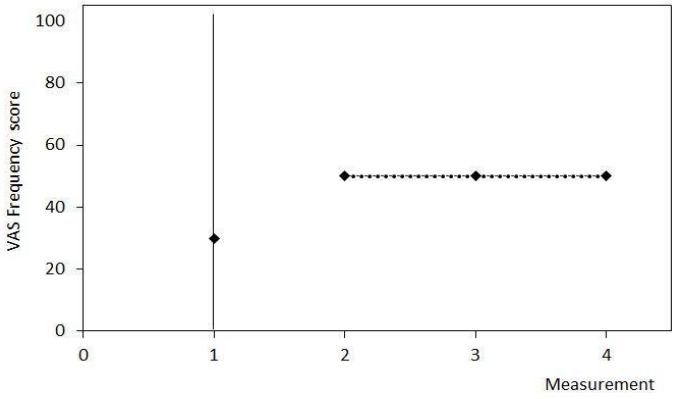
Appendix 35. P5's Variability Analysis (Trended Range) of IES Scores

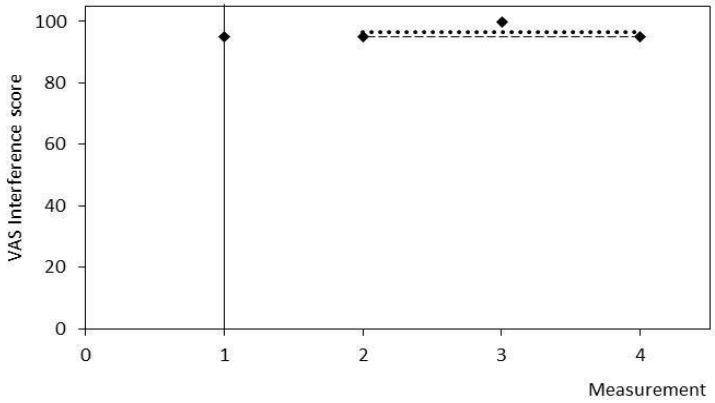


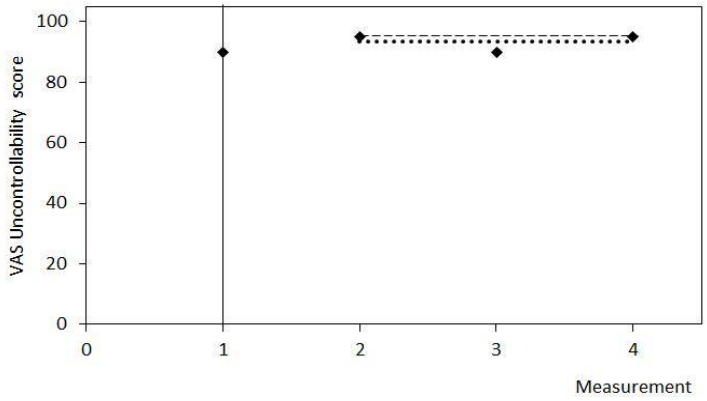


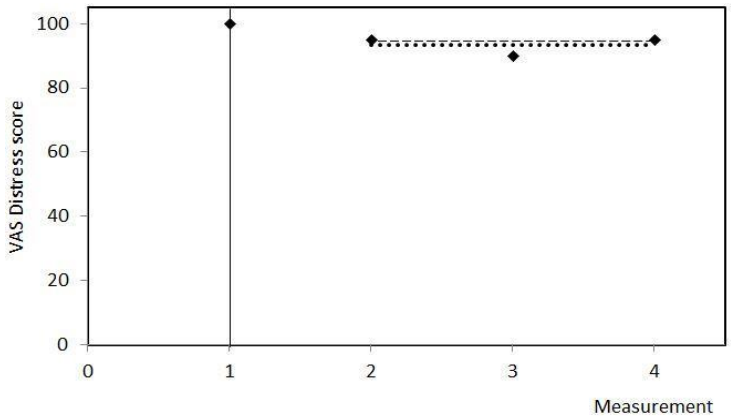


Appendix 36. P5's Trend and Central Location of VAS Scores

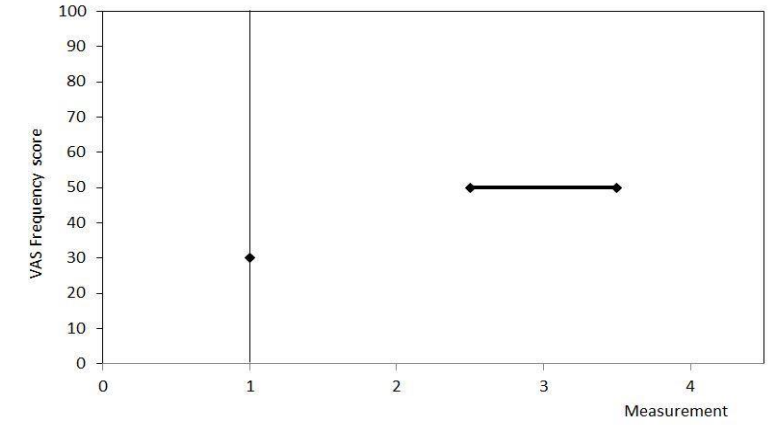


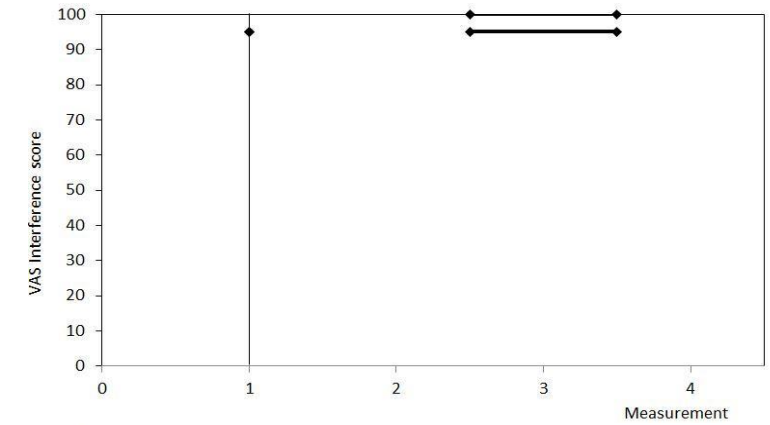


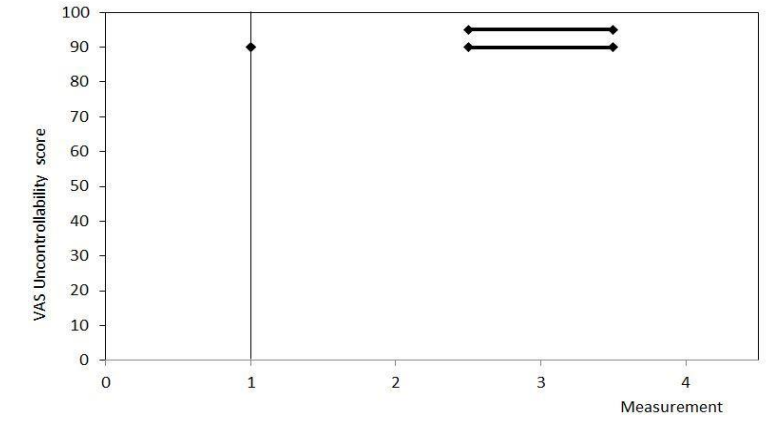


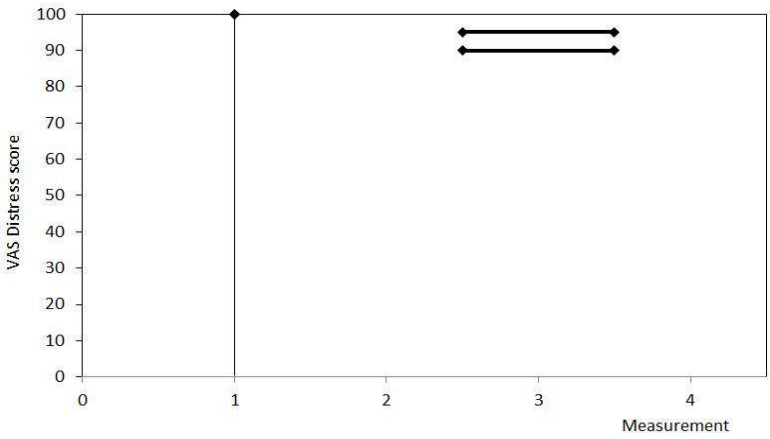


Appendix 37. P5's Variability Analysis (Trended Range) of VAS Scores

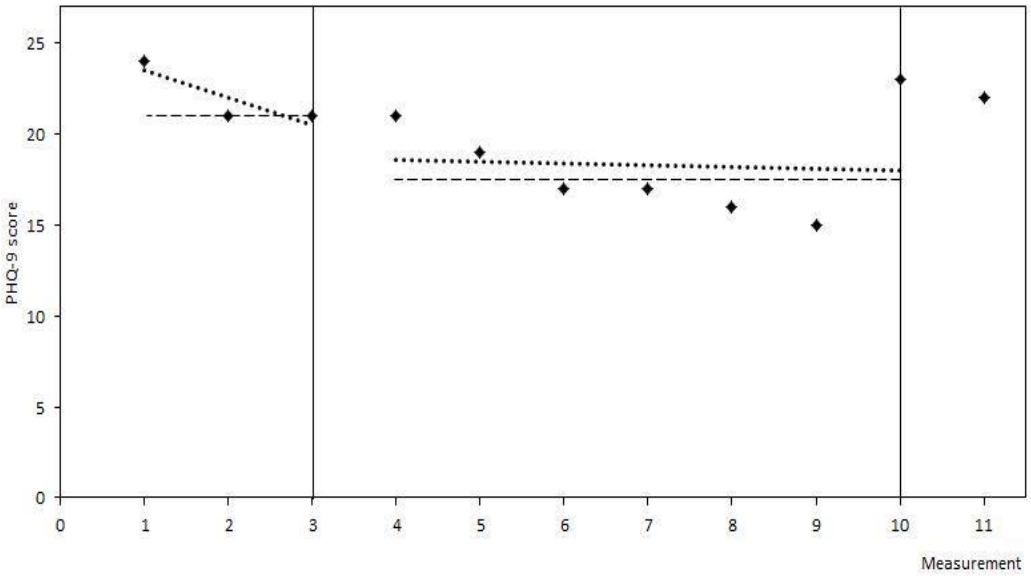


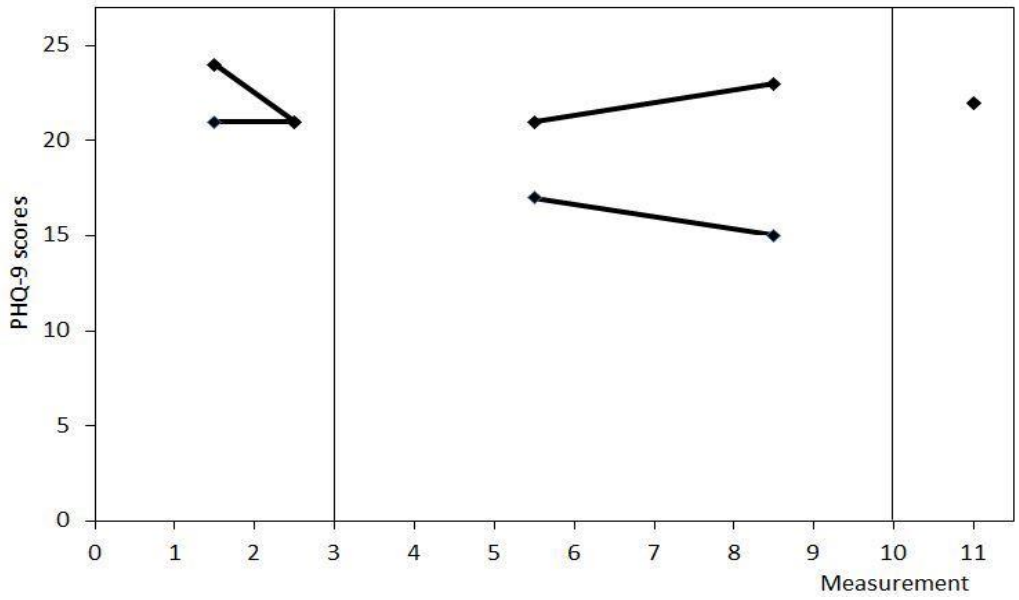




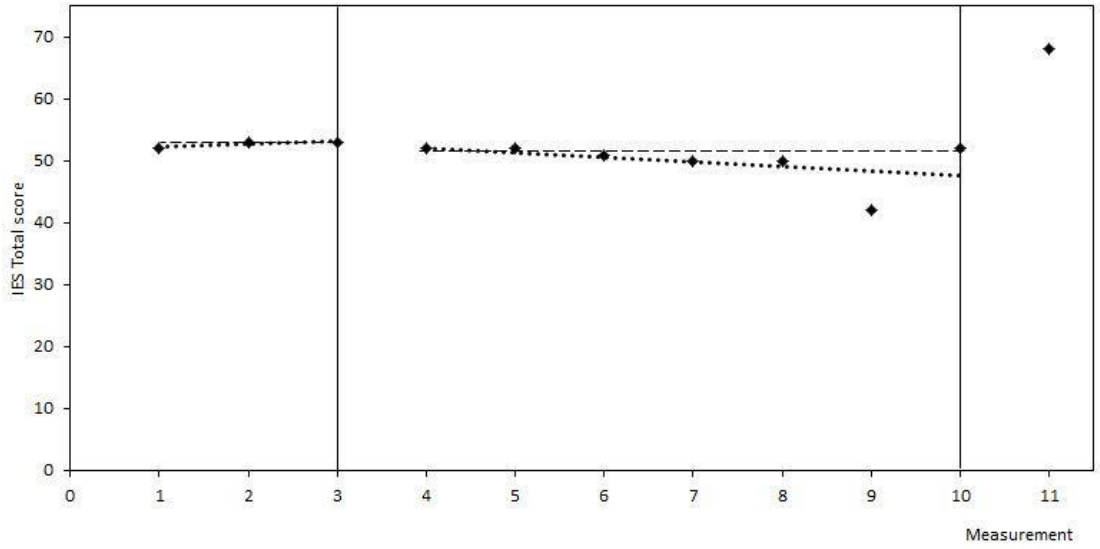


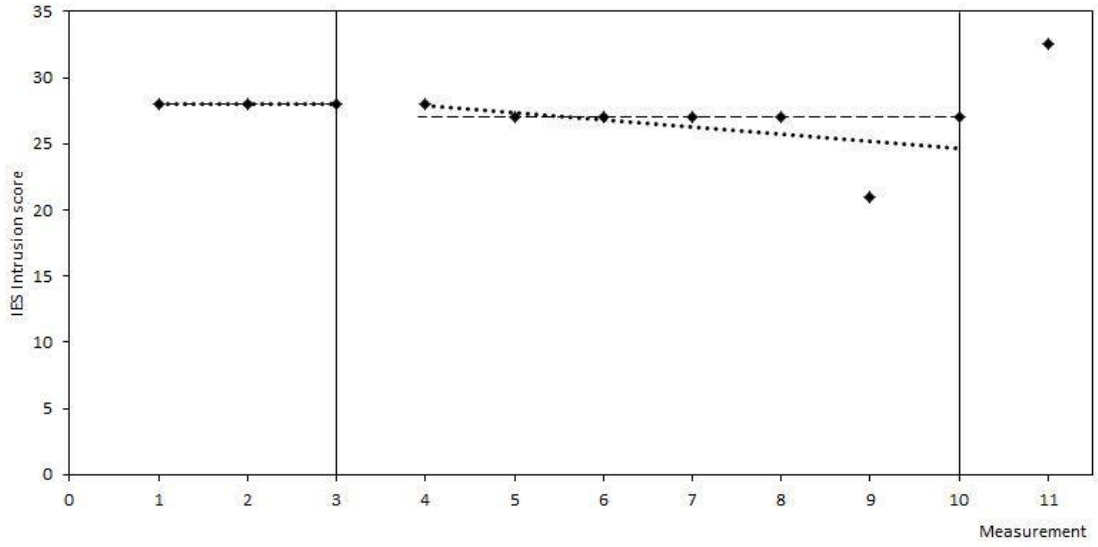
Appendix 38. P6's Trend, Central Location and Variability Analysis (Trended Range) of PHQ-9 Scores

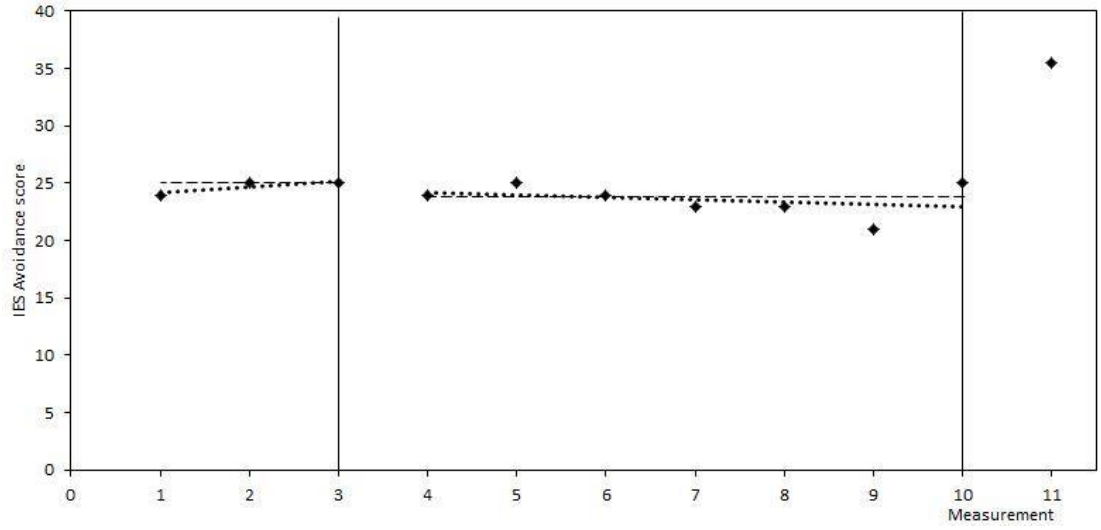




Appendix 39. P6's Trend and Central Location of IES Scores







Appendix 40. P6's Variability Analysis (Trended Range) of IES Scores