Imagery rescripting (ImRs): A model of the mechanisms of action and effectiveness factors in treatment for post-traumatic stress disorder (PTSD)

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Abstract

Post-traumatic stress disorder (PTSD) is characterised by the presence of intrusive and upsetting mental imagery of past traumatic events (American Psychiatric Association [APA], 2013). Research has begun to demonstrate the effectiveness of Imagery Rescripting (ImRs) (Arntz & Weertman, 1999; Smucker, Dancu, Foa, & Niederee, 1995) in the treatment of PTSD. However, despite this apparent effectiveness, there is currently a lack of research into the mechanisms of action underlying the technique and factors that moderate its effectiveness (Arntz, 2012). In addition, no qualitative studies have examined ImRs specifically. The aims of this study therefore were to explore individuals' experience of ImRs in their treatment for PTSD, including factors that influenced its effectiveness, and consider potential mechanisms of action, relative to what is proposed by existing theory. Ten semi-structured interviews were conducted with participants from a London-based trauma service, who had experienced ImRs in their treatment for PTSD. The interviews were analysed using a Grounded Theory (GT) approach (Charmaz, 2014), which generated a theoretical model of ImRs. This model was based upon the nine theoretical codes and 34 focused codes that emerged from the data. The results suggested potential mechanisms of action to be change to memory representations, change to felt sense and change to metacognitive insight and self-efficacy. It was not possible to clearly determine the underlying memory change, however the majority of participants experienced a sense of two memories following ImRs, with some participants experiencing something closer to change to the original traumatic memory. Multiple effectiveness factors were evident, including the theoretical codes of 'factors preceding ImRs', 'individual differences', 'the importance of the therapeutic

structure', 'the importance of the therapist', 'creating an effective rescript', 'long-term accessibility of the rescript' and 'enhancing on-going use of ImRs'. The study's strengths, limitations, clinical implications and suggestions for future research were also discussed.

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Chapter 1: Introduction

"ImRs, although a powerful technique, seems to be a technique in need of a theory"

(Arntz, 2012, p.200)

Overview

Post-traumatic stress disorder (PTSD) is characterised by the presence of intrusive and upsetting mental imagery of past traumatic events (American Psychiatric Association [APA], 2013). Due to the prominence of intrusive images in PTSD and the link between imagery and emotion (Holmes & Matthews, 2005; Holmes, Mathews, Mackintosh, & Dalgleish, 2008) it is of no surprise that imagery techniques are currently being utilised therapeutically to alleviate distress. Research has begun to demonstrate the effectiveness of Imagery Rescripting (ImRs) (Arntz & Weertman, 1999; Smucker, Dancu, Foa, & Niederee, 1995) in the treatment of PTSD. Despite this apparent effectiveness, there is currently a lack of research into the mechanisms of action underlying the technique and the factors that moderate its effectiveness (Arntz, 2012). The present study therefore aimed to address this by interviewing participants to explore their experience of the ImRs technique as part of treatment for PTSD, including what made it more or less effective, and consider potential mechanisms of action relative to what is proposed by existing theory. A resulting model is presented, aiming to increase theoretical understanding of ImRs, to then increase clinical effectiveness.

Mental Imagery

Mental images can be defined as "contents of consciousness that possess sensory qualities as opposed to those that are purely verbal or abstract" (Hackmann, 1998, p.301). These mental images are not purely visual and can also include auditory, olfactory, gustatory, touch and movement sensory qualities (Kosslyn, 1994). This can be thought of as "seeing with the mind's eye or hearing with the mind's ear" (Kosslyn, Ganis, & Thompson, 2001, p.635). Martin and Williams (1990) suggested that mental images are experienced on a continuum, from real events, important for autobiographical memory functioning and recollection (Conway, 2001), to hypothetical events.

Mental images and emotion. The impact of mental imagery on emotions has long been recognised but only more recently demonstrated empirically. Research has shown a causal effect of mental imagery on emotions, stronger than that caused by verbal stimuli, in positive and negative directions (Holmes & Matthews, 2005; Holmes et al., 2008). Holmes and Mathews (2010) suggested three potential mechanisms for the impact of mental imagery on emotions. Firstly, mental imagery directly influences emotional systems in the brain, resulting in emotional reactions similar to actual stimuli (Lang, 1979). This is a possible evolutionary mechanism, with basic emotion systems evolving early to respond to sensory information from the environment, therefore responding to the sensory nature of mental images too (Holmes & Mathews, 2010; Öhman & Mineka, 2001). Secondly, an overlap in processes between mental imagery and perception exists, demonstrated by competition for cognitive resources between the two in the same sensory modality (Baddeley & Andrade, 2000; Segal & Fusella, 1969). Neuro-imaging research has

demonstrated that the same areas of the brain are active when perceiving and imagining, including for emotional stimuli (Ganis, Thompson, & Kosslyn, 2004; Herholz, Halpern, & Zatorre, 2012; Kim et al., 2007). Thirdly, mental images connect with emotional memories. Mental images are present when remembering (Brewer, 1996) and are prominent in autobiographical memory (Conway, 2001). Therefore, if creating mental images draws on autobiographical memory, the image is likely to include the emotion associated with the memory (Conway & Pleydell-Pearce, 2000).

Intrusive mental images. Mental images become intrusive when they "spring to mind unbidden, against a person's will" (Holmes & Mathews, 2010, p.357). Intrusive mental images occur in both non-clinical and clinical populations and can be pleasurable or cause distress (Rusch, Grunert, Mendelsohn, & Smucker, 2000). While intrusive mental imagery is prominent in many psychopathologies (Brewin, Gregory, Lipton, & Burgess, 2010; Holmes & Mathews, 2010), it is most notably linked with PTSD. Intrusive mental images are a hallmark symptom of PTSD and often what prompt people to seek treatment (Holmes, Grey, & Young, 2005).

PTSD

PTSD is a reaction to exposure to actual or threatened death, serious injury or sexual violation. Symptoms include: re-experiencing of the event (e.g., intrusive memories, nightmares and/or flashbacks) resulting in physiological reactivity and psychological distress, avoidance of internal or external stimuli which could serve as reminders, negative alterations in cognition and mood, and alterations in arousal and reactivity (APA, 2013).

Intrusive mental images in PTSD. These intrusive mental images range from sensory fragments of the traumatic event being re-experienced (Ehlers et al., 2002; Ehlers & Steil, 1995) to full dissociative flashbacks. These intrusions are characterised by a sense of 'nowness' (APA, 2013; Hackmann, Ehlers, Speckens, & Clark, 2004), which is linked to a sense of current threat (Ehlers & Clark, 2000). Research has suggested that while re-experiencing involves multiple senses, visual images are the most common (Ehlers et al., 2002; Ehlers & Steil, 1995; Hackmann et al., 2004; Brewin & Holmes, 2003). It has been suggested that distress associated with intrusions, the sense of 'nowness' and a lack of context predict PTSD severity (Michael, Ehlers, Halligan, & Clark, 2005). Intrusive mental images maintain PTSD and impact upon behaviour and physiology (Pearson, Naselaris, Holmes, & Kosslyn, 2015).

Generally, intrusive mental images in PTSD relate to the 'hotspots' of the trauma memory, the subjectively worst and most emotional moments for the individual (Ehlers & Clark, 2000; Holmes et al., 2005; Richards & Lovell, 1999). Cognitions in 'hotspots' often relate to threat to physical integrity, or more commonly threat to sense of self (Holmes et al., 2005). While fear is a predominant emotion, other emotions are prominent as well, such as anger, sadness and shame (Grey & Holmes, 2008; Grey, Holmes, & Brewin, 2001; Holmes et al., 2005). Intrusive mental images can also be of moments just before the trauma occurred or the meaning worsened, that is, 'warning signals', adaptive for future safety (Ehlers et al., 2002). Hackmann (2011) suggested that intrusions could also be imagined events, recalled as happening during or following the trauma.

Treatment for PTSD.

National Institute for Clinical Excellence (NICE) guidelines (2005). The current NICE guidelines recommend trauma-focused CBT (TF-CBT) or eye movement desensitisation and reprocessing (EMDR) therapies as treatment for PTSD.

Exposure therapy (ET). Early models of PTSD treatment were largely behavioural in approach. They suggested that during the traumatic event, previously neutral stimuli become primed to elicit fear through classical conditioning, resulting in avoidance (Keane, Zimering, & Caddell, 1985). Treatment therefore emphasised the importance of exposure to the trauma memory and subsequent reduction of the conditioned emotional response to trauma-related cues in order to promote extinction (Mowrer, 1960). To achieve this, the traumatic memory is 're-lived', either in-vivo, or more commonly, through imaginal exposure (IE). During IE the individual vividly imagines the traumatic event, with the aim of habituation and extinction of the fear response (Jaycox & Foa, 1996). The fear network theory (Lang, 1977; 1979) suggests that IE activates the fear network and incorporates new information, such as fear habituation. ET therefore could be effective due to facilitating complete emotional processing of the event (Foa & Kozack, 1986; Grey, Young, & Holmes, 2002).

Despite the effectiveness of ET, there appear to be limitations in utilising this approach in isolation. ET has been found to result in higher levels of dropout from therapy, than when combined with other techniques (Arntz, Tiesema, & Kindt, 2007). Furthermore, it has been suggested that ET is most effective when the predominant emotion is fear or anxiety (Arntz et al., 2007; Jaycox & Foa, 1996; Smucker & Dancu, 2005). Indeed, exposure without considering emotions such as shame or guilt

could be detrimental (Lee, Scragg, & Turner, 2001). Ehlers, Clark, Hackmann, McManus, and Fennell (2005) demonstrated that a largely cognitive intervention resulted in highly significant improvement in PTSD symptoms, suggesting exposure alone might not be the effective technique.

TF-CBT. TF-CBT, developed after ET, incorporated additional cognitive techniques. Cognitive models of PTSD, such as Ehlers and Clark's (2000), suggest that the nature of the trauma memory and negative appraisals lead to a sense of current threat, maintained by behavioural and cognitive strategies intended to control the sense of threat and symptoms. Therefore, verbal cognitive restructuring techniques are used to work with emotions and cognitions that occurred during and following the trauma, with Grey et al. (2002) highlighting the importance of addressing peri-traumatic appraisals. This can be particularly effective in addressing emotions in addition to fear and anxiety (Grey et al., 2002; Grunert, Smucker, Weis, & Rusch, 2003; Grunert, Weis, Smucker, & Christianson, 2007). Imagery techniques have also been incorporated into cognitive treatment for PTSD (Ehlers & Clark, 2000; Ehlers et al., 2005; Hackmann, 2011).

Memory consolidation and re-consolidation.

Memory consolidation. A 'cognitive vaccine' to interrupt memory consolidation has recently been suggested (Holmes, James, Coode-Bate, & Deeprose, 2009, p.1), which could be pivotal in future PTSD treatment. Simplistically, memory consolidation is the process of a new 'labile' memory undergoing stabilisation into long-term storage (Dudai, 2004; Nader, Schafe, & LeDoux, 2000). Analogue studies have demonstrated that visuo-spatial tasks completed peri-traumatically reduce

intrusive mental images (Baddeley & Arendale, 2000; Holmes, Brewin, & Hennessey, 2004; Stuart, Holmes & Brewin, 2006). Importantly for PTSD treatment, completing a visuospatial task within a four-hour window after watching a traumatic film resulted in reduced flashbacks, leaving deliberate memory recall intact (Holmes et al., 2009; Holmes, James, Kilford, & Deeprose, 2010). Holmes et al. (2009) suggested the effectiveness may be due to the limited resources of working memory and therefore visuo-spatial tasks competing for resources with visual images, disturbing memory consolidation, and subsequently decreasing later flashbacks (Andrade, Kavanagh, & Baddeley, 1997; Holmes et al., 2004; Kavanagh, Freese, Andrade, & May, 2001; Hout, Muris, Salemink, & Kindt, 2001). The importance of resources being from the same modality is demonstrated by verbal tasks not reducing flashbacks post trauma and even increasing them (Bourne, Frasquilho, Roth, & Holmes, 2010; Holmes et al., 2010).

Memory re-consolidation. It may not be practically possible to intervene therapeutically before traumatic memories are consolidated. In addition, NICE guidelines (2005) suggest that intervention shortly after a traumatic event should not be offered (Mayou, Ehlers, & Hobbs, 2000; McNally, Bryant, & Ehlers, 2003), although this has been called into question (Dyregrov & Regel, 2012). It is important therefore to consider memory re-consolidation some time after a traumatic event.

It was initially suggested that once a memory was formed, it was stable and its content largely remained unchanged, as it had moved from the hippocampus to the neo-cortex (McGaugh, 2000; Squire & Alvarez, 1995; Squire & Davis, 1981). An alternative theory of consolidation is proposed by multiple trace theory (MTT) (Nadel

& Moscovitch, 1997; Moscovitch & Nadel 1999). MTT suggested that every time a memory is retrieved a new memory trace is created in the hippocampus (Nadel, Samsonovich, Ryan, & Moscovitch, 2000). However, Lane et al. (2015) suggested that MTT does not only propose that a new memory trace is created but that the original memory trace becomes 'labile' enabling it to be amended or access disrupted, which could be viewed as reconsolidation (however see also Nader et al., 2000). Much research has challenged the stability of memory (Dudai, 2006). Lewis (1979) suggested a division of active memory (new and reactivated) and inactive (consolidated and not reactivated). Schiller and Phelps (2011) stated that interfering with reconsolidation by pharmacological or behavioural means either blocks or alters re-storage of memory.

Animal studies have demonstrated that fear memories can be reconsolidated (Dudai, 2009; Nader et al., 2000; Tronson & Taylor, 2007). Studies with humans have found that administering propranolol (which regulates long-term memory storage) after re-activating a traumatic memory reduces physiological responses, weakening the fear response, possibly by blocking reconsolidation (Brunet et al., 2008; 2011; Kindt, Soeter, & Vervliet, 2009). However it has been suggested that Kindt et al. (2009) did not accurately target the reconsolidation mechanism (Schiller & Phelps, 2011). Importantly, Schiller et al. (2010) used a non-pharmacological method to alter (rather than block) memory. They demonstrated that through extinction training, old fearful memories can be updated during a reconsolidation window with new non-fearful information, resulting in fear responses no longer being demonstrated. They found this to be the case for the target memory only and that this effect was evident a year later. Agren et al. (2012) found that extinction occurring in the reconsolidation

window erased fear traces in the amygdala and weakened the connection in fear circuits. However, some studies have not demonstrated comparable results (Golkar, Bellander, Olsson, & Ohman, 2012; Kindt & Soeter, 2013).

Reconsolidation differs to extinction, where it has been proposed that the individual learns that the conditioned stimulus (CS) does not predict the unconditioned stimulus (US), by creating a safe memory that competes with the original. This safe memory then inhibits, rather than erases, the fearful memory (Bouton, 2002). This means that the CS-US association remains stored in memory and could be reinstated in a different context (Maren, 2011; Schiller et al., 2010), perhaps explaining PTSD relapse (Debiec, Bush, & Ledoux, 2011). Clearly if treatment for PTSD could reconsolidate memories, rather than create alternatives, this would have far reaching effects for clinical effectiveness. However, Brewin (2015) suggested that it is premature to suggest reconsolidation can explain therapeutic change and that retrieval competition accounts (i.e., where a new memory is retrieved over the original traumatic memory) are better placed to explain this.

ImRs

Imagery techniques have been utilised therapeutically for thousands of years (Edwards, 2007; 2011) and their importance has been recognised since the advent of cognitive therapy (Beck, 1979), particularly when working with traumatic memories (Smucker, 1997). A specific imagery technique, ImRs (Arntz & Weertman, 1999; Smucker et al., 1995), is increasingly being used by therapists to treat PTSD (Arntz, 2012). Dibbetts and Arntz (2015) state, "during ImRs a person is instructed to mentally relive a memory or fantasy of an aversive experience and, next, to change

the course of events in a more desired direction" (p.1).

ImRs involves the traumatic memory being activated by the individual giving a verbal description of the image/memory, including events, sensory and perceptual experiences, emotions, cognitions, and needs (Arntz, 2011). Individuals are then guided by their therapist to imagine their needs met and a desired outcome being achieved in the image (Hackmann, 1998). The rescript can involve correcting a distorted image, using compassion, being reassured, reducing threat perceptions and overcoming perpetrators (Arntz, 2012; Hackmann, 2011). It has been suggested that the rescript can be prepared collaboratively prior to imagining (Ehlers & Clark, 2000), be created 'online' based on needs and wishes present during imagining (Arntz, 2012), or the therapist can decide. In contrast to cognitive techniques, ImRs rarely involves verbally challenging thoughts associated with the trauma (Brewin et al., 2009).

Pre-emptive rescripting. It is not yet clear when the rescript should begin, that is, when the sequence of events should be changed. It has been suggested that rescripting could pre-empt the traumatic event in memory, as it is not necessary to imagine the whole aversive event (Arntz & Weertman, 1999; Krakow & Zadra, 2006). Recent research with refugees with complex trauma histories demonstrates that rescripting is effective when begun before the worst part of the traumatic event, but late enough to trigger an arousing expectation (Arntz, Sofi, & Breukelen, 2013), in line with the 'warning signal' hypothesis (Ehlers et al., 2002). In contrast, treatment for PTSD has long emphasised the importance of including the most aversive scenes (Ehlers & Clark, 2000). Furthermore, Dibbets and Arntz (2015) recently conducted an

analogue study demonstrating that including the most aversive scenes in ImRs resulted in the greatest reduction in the frequency and vividness of intrusive mental images.

Efficacy of ImRs.

Efficacy transdiagnostically. Research is accumulating that demonstrates the effectiveness of ImRs with a wide range of presenting issues (Arntz, 2012). The technique has been used effectively to modify core schemas in personality disorders (PD), using a slightly different approach to that for intrusive images in PTSD, with three stages of varying child and adult perspectives (Arntz, 2011; Arntz & Weertman, 1999; Weertman & Arntz, 2007). Holmes, Arntz, and Smucker (2007) referred to this as a 'type b' technique - a new positive image is constructed where there is not necessarily an underlying distressing negative image.

ImRs has also been found to be effective for depression (Brewin et al., 2009; Wheatley et al., 2007), social phobia (Frets, Kevenaar, & van der Heiden, 2014; Wild, Hackmann, & Clark, 2007; 2008), bulimia nervosa (Cooper, Todd, & Turner, 2007; Ohanian, 2002), obsessive-compulsive disorder (Veale, Page, Woodward, & Salkovskis, 2015), simple phobia (Hunt et al., 2006), nightmares (Krakow & Zadra, 2006) and PTSD (Arntz, 2012). Holmes et al. (2007) referred to this as a 'type a' technique - a pre-existing negative mental image is transformed into a more benign image.

Efficacy with PTSD. It is evident that ImRs (largely 'type a' techniques for adult trauma) is particularly relevant to PTSD treatment due to the prominence of

intrusive mental images and memories (Arntz, 2012). Grunert et al. (2007) examined 23 participants with PTSD due to industrial accidents who had not improved with ET alone. Following an ImRs and cognitive restructuring intervention, 18 out of 23 participants were in recovery. However, this research did not include a second treatment group for comparison. Arntz et al. (2007) conducted a randomised control trial with 71 participants diagnosed with PTSD to compare IE, IE and ImRs, and waiting list. They found that IE, and IE and ImRs combined, were of equal effectiveness in reducing PTSD symptoms. However, IE and ImRs combined were more effective for emotions such as anger, hostility and guilt. Kindt, Buck, Arntz, and Soeter (2007) also examined the effects of IE and ImRs with 25 participants with PTSD. The results of this study largely focused on the change from perceptual to conceptual coding of traumatic memories. However, it also demonstrated that IE and ImRs combined was an effective treatment. Unfortunately, the effects of ImRs alone could not be determined.

However, the stand-alone effectiveness of the ImRs technique for PTSD has also been demonstrated. Smucker et al. (1995) showed that ImRs reduces PTSD symptoms in survivors of childhood sexual abuse, although this did include some exposure to the traumatic memory. More recent research has demonstrated ImRs to be effective in refugees with 'complicated' PTSD, using a multiple base-line case series design, with the re-script beginning just before the worst moment of the trauma occurred, making the technique more tolerable (Arntz et al., 2013). 'Pre-emptive' ImRs has also been found to be an effective stand-alone intervention for PTSD due to childhood sexual and/or physical abuse (Raabe, Ehring, Marquenie, Olff, & Kindt, 2015). Interestingly, Hagenaars and Arntz (2012) conducted an analogue study that demonstrated ImRs to

be effective soon after viewing a traumatic film in reducing the number of intrusive mental images and negative cognitions, presumably by interrupting memory consolidation.

Theories of PTSD: Cause and Maintenance of Intrusive Mental Images

Multiple theories and models have been proposed to explain PTSD. It is important to understand what these theories suggest regarding the cause and maintenance of intrusive mental images, and PTSD treatment, to examine possible mechanisms of action of ImRs. Brewin and Holmes (2003) suggested that early theories of PTSD could be divided into: conditioning, information-processing and social-cognitive theories.

Early theories.

Conditioning theories. These focus on learned associations and avoidance behaviour (Brewin & Holmes, 2003). Early explanations of PTSD proposed that Mowrer's (1960) learning theory, including classical and instrumental learning, could explain PTSD. This theory suggests that a neutral stimulus (NS) (e.g., a lift) is paired with an US (e.g., an assault) and the neutral stimulus then acts as a predictive CS for the US, resulting in a conditioned response (CR) (e.g., fear). During a traumatic event, multiple stimuli could be conditioned to provoke the CR and even stimuli not present at the time of trauma, due to stimulus generalisation and higher order conditioning (Keane, Zimmerling, & Caddell, 1985). Furthermore, operant conditioning suggests that avoidance of the CS is strengthened through negative reinforcement (fear reduction), preventing weakening of the association between the CS and CR (Gonzalez-Prendes & Resko, 2012). Research has also found that a CR can be created

using imagery, with the CS or US not actually present (Dadds, Bovbjerg, Redd, & Cutmore, 1997) and is even a possibility with both the CS and US being imagined (Dibbets, Poort, & Arntz, 2012).

Information-processing theories. These focus on the encoding, storage and retrieval of traumatic events and stimuli and responses, and less on the wider context (Brewin & Holmes, 2003). They suggest that traumatic memories are incompletely processed and stored differently in memory to non-traumatic autobiographical memories, resulting in PTSD. For example, Lang (1977; 1979) reformulated conditioning theories and suggested a fear network model. This provides a bio-informational understanding of fear, whereby traumatic events are represented in memory as interconnections between 'nodes' in an associative network. This network includes: perceptual information about the feared stimulus; verbal, physiological and behavioural responses; and the meaning of the event. This theory combines affect and cognition and suggests that a fear memory is accessed when a critical amount of information is presented that matches what is in the network, prompting escape or avoidance behaviour. Ji, Heyes, MacLeod, and Holmes (2016) highlighted how Lang's theory (1977; 1979) suggests that an imagined and an actual emotional stimulus might activate an overlapping network, resulting in similar emotional responses.

Social-cognitive theories. These focus on how a traumatic event violates an individual's previously held beliefs about themselves, the world and others, and their subsequent attempts to reconcile this (Brewin & Holmes, 2003). For example, the psycho-dynamically influenced stress response theory (Horowitz, 1976; 1986)

suggests that following trauma, 'outcry' occurs, followed by attempts to assimilate and reconcile what has happened with previously held beliefs. If the event cannot be reconciled, reminders are avoided, and memories come to mind unbidden. The theory of shattered assumptions (Janoff-Bulman, 1992) suggests that three assumptions are particularly relevant to trauma: the world is benevolent, the world is meaningful and the self is worthy. If the trauma is not reflected upon, these assumptions are unable to be updated, resulting in continued distress.

Current theories. There are three theories of PTSD that developed from earlier theories and are now prominent in the literature: emotional processing theory (Foa & Kozack, 1986; Foa, Steketee, & Rothbaum, 1989), dual representation theory (Brewin, Dalgleish, & Joseph, 1996; Brewin et al., 2010) and Ehlers and Clark's (2000) cognitive model (Brewin & Holmes, 2003).

Emotional processing theory (Foa & Kozack, 1986; Foa et al., 1989). Emotional processing theory built upon Lang's (1977; 1979) information-processing fear network theory. Foa and Kozack (1985; 1986) suggested that fear becomes pathological when the memory network includes excessive response elements, is resistant to change, the associations are not realistic and it includes high negative emotion. Fear networks in PTSD include information about danger, physiological preparation for escape and cognitions such as 'the world is totally dangerous' and 'the self is totally incompetent' (Foa & Riggs, 1993; Foa & Rothbaum, 1998). Foa et al. (1989) suggested that the connections between nodes in the fear network are strong, over-inclusive and have a low threshold for activation. This results in multiple stimuli activating the network, meaning an individual is regularly in a state of high arousal,

regularly re-experiences the trauma and is regularly avoidant. Importantly, this avoidance prevents adequate emotional processing of the traumatic event and modification of memory structures that underlie emotions (Foa & Kozack, 1986).

Dual representation theory (Brewin et al., 1996; Brewin, et al., 2010). The emotional processing theory (Foa & Kozack, 1986; Foa et al., 1989) was later challenged by the dual representation theory (Brewin et al., 1996; Brewin et al., 2010). This theory suggested that two memory systems operate in parallel: 1) the verbally accessible memory system (VAM) and 2) the situationally accessible memory system (SAM) (Brewin et al., 1996). Subsequently, Brewin et al. (2010) revised this by suggesting that VAMs be referred to as contextual 'C-memory/C-reps' and SAMs as sensation based 'S-memory/S-reps'. Brewin et al. (2010) proposed that C-reps are comprised of autobiographical content that is spatially and temporally contextualised, updated over time, under conscious control, voluntarily retrieved and transferred to long-term memory. C-reps are supported by the prefrontal and medial temporal areas of the brain, including the hippocampus and para-hippocampus. In contrast, S-reps are comprised of content that is largely sensory and perceptual, not contextualised, not updated over time, involuntarily retrieved and not transferred to long-term memory. S-reps are supported by subcortical brain structures, such as the amygdala and the insula. Uncontextualised S-reps form the basis of flashbacks and nightmares in PTSD.

Brewin et al. (2010) proposed that in non-traumatic memory, an S-rep is associated with the appropriate C-rep in the medial temporal lobe, via the precencus, even for stressful situations. This results in context being provided for the S-rep and it being

integrated into autobiographical memory, resulting in the memory not being re-experienced, as if it is happening in the 'here and now'. In addition, control can be exerted over the S-rep from the prefrontal cortex, due to an association having been made. In contrast, in traumatic memory, Brewin et al. (2010) suggested that intrusions occur due to the creation of an S-rep from a traumatic event without an association being made to a corresponding C-rep. They suggested that extreme stress levels during the trauma result in narrowing of attention and decrease in hippocampal functioning, leading to problems in creating C-reps. In addition, interruptions to encoding, such as dissociation, at the time of the trauma also disrupts C-rep formation. Therefore, strong S-reps and weaker C-reps exist, with impaired associations between the two. Furthermore, C-reps cannot exert top-down control over the S-reps, resulting in them being triggered unexpectedly. Brewin et al. (2010) suggested that behavioural and cognitive avoidance result in maintaining the incomplete nature of the C-rep.

Retrieval competition hypothesis (Brewin, 2006). Brewin's (2006) retrieval competition hypothesis suggests that emotions and behaviours are under the control of alternative memory representations which are in retrieval competition with each other. In relation to Brewin et al.'s (2010) theory, retrieval competition suggests that when exposed to cues of the traumatic event the non-contextualised stronger S-rep prevails in retrieval competition over the C-rep, resulting in the traumatic memory being re-experienced.

Cognitive model (Ehlers & Clark, 2000). Ehlers and Clark (2000) later developed a cognitive model of PTSD. They suggested that persistent PTSD occurs

when individuals process the traumatic event in a way that leads to a sense of serious current threat. Current threat can be conceptualised as external (e.g., the world is a more dangerous place) or internal (e.g., threat to one's view of oneself). This sense of threat occurs due to three factors: negative appraisals of the trauma (e.g., I attract disaster), negative appraisals of its sequelae (e.g., I cannot rely on other people) and autobiographical memory disturbance. Maladaptive behavioural and cognitive strategies are then adopted in an attempt to control the perceived threat and symptoms. Ehlers and Clark (2000) also proposed two routes to retrieving autobiographical information. Firstly, non-traumatic memories are retrieved through higher-order meaning based processes, from an organised knowledge base (Conway & Pleydell-Pearce, 1997). Secondly, traumatic memories are retrieved due to being triggered by stimuli associated with the traumatic event, as they are poorly elaborated and contextualised and not assimilated with other autobiographical memories. They suggested that these characteristics of traumatic memories explain intrusions being unintentionally recalled, the 'here and now' quality and the lack of links to subsequent information.

The cognitive model also draws on learning theory (Mowrer, 1960; Watson & Rayner, 1920) suggesting that stimulus-stimulus and stimulus-response associations for traumatic events are stronger than for non-traumatic events, resulting in the traumatic memory being more easily triggered. Ehlers and Clark (2000) suggested that cues present at the time of the trauma therefore become predictors of imminent danger. These cues (CS) or 'warning signals' will therefore result in fear (CR) even when there is no current threat to the individual (Ehlers et al., 2002). They also suggested that data-driven/perceptual processing at the time of the trauma leads to

strong perceptual priming and a memory that is hard to intentionally retrieve, as it has not been processed conceptually and given a context (Roediger, 1990; Roediger & McDermott, 1993).

Implications for treatment. Early conditioning theories (Mowrer, 1960) suggest that repeated exposure to the traumatic memory should extinguish fear associations. This could occur through fear habituation and/or the generation of a new, safe memory, which inhibits the fearful memory (Bouton, 2002; Rescorla, 2001). However, this is not always effective, as conditioned fear responses can return over time and are context dependent (Bouton, 1993; Maren, 2011; Schiller et al., 2010).

Emotional processing theory (Foa & Kozack, 1986; Foa, et al., 1989) suggests that, to reduce fear, strong associations in the fear network must be weakened by activating the network with matching information, and incorporating new, corrective information, that is incompatible with the fear structure (e.g., repeated exposure to going out alone and not being attacked) (Foa & Kozack, 1986). This new information could be a change in association due to conditioning, physiological habituation, and/or change in emotions (Foa & Kozack, 1986). Foa and Kozack (1986) suggested that the change in the fear structure can be viewed as emotional processing (Rachman, 1980), that is, "the modification of memory structures that underlie emotions" (p.20).

The revised dual representation theory (Brewin et al., 2010) suggests that exposure to intrusive images enables S-reps to be processed and contextualised to create a coherent account of the traumatic event. This occurs by transferring parts of S-reps

into more elaborated C-reps. An association between S-reps and C-reps is also created, via the posterior parietal and retrosplenial cortices, so that S-reps are provided context by the hippocampus. The new contextualised C-reps then win retrieval competition and distress is decreased (Brewin et al., 2010). Therefore, the retrieval competition hypothesis suggests that the original traumatic memory remains intact and unchanged, however recovery occurs when new positive representations are more accessible and an individual retrieves these, rather than the traumatic representation (Brewin, 2006; Brewin et al., 2010; Brewin & Holmes, 2003).

The cognitive model (Ehlers & Clark, 2000) suggests that through exposure the traumatic memory becomes elaborated and contextualised into previous and subsequent experience, which reduces intrusions. In addition, negative appraisals of the trauma and its sequelae need to be changed, in line with the theory of shattered assumptions (Janoff-Bulman, 1992). Finally, behavioural and cognitive strategies to control both perceived threat and symptoms should be stopped.

Clearly therefore, existing theories of PTSD largely suggest that an individual needs to be fully exposed to the traumatic memory, to enable emotional processing to occur, and the memory to be updated and contextualised, to prevent further intrusions.

ImRs: Effectiveness Factors and Mechanisms of Action

Considering the emphasis that existing theories place on exposure to the traumatic memory, the effectiveness of ImRs appears contradictory. In contrast to suggestions from these theories, ImRs involves changing the ending of the traumatic memory, no

matter how inconceivably, and does not require exposure to the whole memory (Arntz et al., 2013).

Arntz (2012) suggested that future research should examine both the optimal therapeutic method and the underlying processes of ImRs, such as the "fundamental levels of memory representations that ImRs acts on" (p.199). Arntz (2012) highlighted that while emotion, cognition and meaning change are important, the question remains, "what happens to the original memory?" (p.201). There currently appear to be two prominent theories that could fundamentally underlie the technique. Firstly, ImRs might change the existing memory, likely through a process of reconsolidation and updating the meaning (Arntz, 2012). Secondly, ImRs might create a new, less negative, alternative memory, which is more accessible and therefore wins retrieval competition over the traumatic S-rep (Brewin, 2006; Brewin et al., 2010). It is foreseeable that ImRs could also work due to a combination of these theories. Furthermore, change in memory processing during ImRs from perceptual to conceptual could also act as a mechanism for change. It is clear that to explore the mechanisms of action, the factors that create a clinically effective rescript need to be examined also (Arntz, 2012). These factors are likely to be wide ranging, with possibilities including: accessing original emotions and cognitions, changing emotions or cognitions, meeting unmet needs, facilitating self-efficacy, and adapting factors related to the rescript itself. Thus far, there has been limited research into effectiveness factors and the mechanisms of action of ImRs, and no definitive theory proposed.

Memory change as a fundamental mechanism of action.

Changing the original traumatic memory. One potential mechanism of action is that ImRs changes the original traumatic memory. Hackmann (1998) suggested that imagery techniques access and transform meanings of negative memories. It is possible that changing the meaning of one memory could change meanings across a memory network (Wheatley & Hackmann, 2011). It has been proposed that ImRs could work by 'UCS-revaluation', that is, a change in meaning of the US stimulus, the traumatic event (Arntz, 2011; Arntz, 2012; Arntz & Weertman, 1999). Arntz (2014) suggested that the aim of ImRs is to incorporate new information into the traumatic memory, to reduce dysfunctional meaning, so a reminder of the trauma will result in the new memory representation being accessed, along with decreased distress. This would suggest that memory reconsolidation is occurring. As previously mentioned, this is in contrast to a proposed mechanism of action of extinction, and dual representation theory (Brewin et al., 2010) and retrieval competition hypothesis (Brewin et al., 2006), which both suggest a new memory representation is created. If, conversely, ImRs changed the original memory this would be beneficial for treatment generalisation, and therefore possibly decrease the chance of relapse (Debiec et al., 2011).

Research exists to support this proposed mechanism of action. Dibbets et al. (2012) conducted an analogue study in which participants viewed a traumatic film to create a conditioned fear response, were subject to different extinction conditions, and were then presented with the original context to determine if fear returned. Including ImRs in the extinction procedure resulted in less return of fear following a context change, and the US was rated less negatively. The authors suggested that this demonstrates

that ImRs changes the US, thereby changing the meaning of the original memory. Furthermore, Hagenaars and Arntz (2012) conducted an analogue study in which participants viewed a traumatic film and then 30 minutes later used either ImRs, unrelated positive imagery or engaged in IE. The results showed that those in the ImRs condition experienced fewer intrusions in the following week and fewer negative cognitions. The authors suggested that ImRs changed the meaning of the traumatic event, rather than replacing or erasing the memory (Arntz, 2012).

In line with this, Lane, Ryan, Nadel and, Greenberg (2015) recently proposed a theory suggesting that therapeutic changes stem from "updating of prior emotional memories through a process of reconsolidation that incorporates new emotional experiences" (p.1). This is in line with ideas from emotional processing theory, whereby the network is activated and new and corrective information is incorporated by modifying memory structures that underlie emotional responding (Foa & Kozack, 1986; Foa et al., 1989). Lane et al. (2015) proposed that it is possible that once a memory is changed, the original memory and associated emotions may no longer be retrievable. However, others disagree, in relation to ImRs at least, stating that factual memory of the event may be enhanced and it is the meaning that is changed (Arntz, 2012; Hagenaars & Arntz, 2012). Arntz (2012) also proposed that if facts of the traumatic memory remain this suggests that this original memory is not replaced by a new, more accessible memory. ImRs therefore may activate old emotional responses and incorporate new and corrective emotional elements to the original traumatic memory, through reconsolidation (Lane et al., 2015).

Creating a new, more accessible memory. In contrast, the dual representation theory (Brewin et al., 1996; Brewin et al., 2010) and the retrieval competition hypothesis (Brewin, 2006) propose that ImRs is effective due to the creation of a less negative and more accessible memory, which wins retrieval competition over the original traumatic memory. Brewin et al. (2010) suggested that ImRs works by retrieving the C-rep of the intrusive memory/image, projecting it onto the precencus, and then accessing the content of associated S-reps. The information in the S-reps is then contextualised by linking with a new C-rep. This new C-rep is a mixture of negative information, and positive novel information. Subsequently, when this new C-rep is retrieved into the precencus, positive emotions and sensations will be retrieved from S-memory. Brewin et al. (2010) suggested that this new C-rep then wins retrieval competition over the old C-rep, whereas Dibbetts and Arntz (2015) suggested it is accessed rather than the old S-rep. Importantly, regardless of the accuracy of the rescripted image, if it is more accessible, the traumatic memory will be inhibited (Brewin, 2006; Brewin et al., 2009). Research supports this proposal, for example Stopa and Jenkins (2007) found that when participants with social phobia held a negative image in mind, this inhibited the retrieval of positive images. They suggested that ImRs might therefore inhibit the retrieval of negative information and promote the retrieval of positive information.

Brewin (2015) suggested that the retrieval competition hypothesis (Brewin et al., 2006) is better placed to explain therapeutic change, than Lane et al.'s (2015) model of reconsolidation. He proposed that evolutionarily it would be more effective for a memory system to retain information to aid future survival, there is evidence for the

stability of memory, and having two memory systems that are more or less accessible helps to explain relapse from conditions such as PTSD.

Changing memory processing. It is possible that the nature of memory processing facilitated by ImRs could be linked to its effectiveness. It has long been suggested that traumatic memories are represented at a sensory, perceptual level, and lack conceptual representation, and that treatment needs to promote conceptual processing (Brewin et al., 2010; Ehlers & Clark, 2000). Studies have demonstrated that data-driven processing and resulting perceptual memory representations during and after trauma can predict PTSD symptoms (Halligan, Michael, Clark, & Ehlers, 2003; Kindt, van den Hout, Arntz, & Drost, 2008; Murray, Ehlers, & Mayou, 2002). Kindt et al. (2007) conducted a study to examine the effects of IE and ImRs on perceptual and conceptual processing of a traumatic memory and PTSD symptom reduction. They found that when controlling for conceptual processing, an increase in perceptual processing was not directly linked to symptom reduction. However, initial increases in perceptual processing resulted in later increases in conceptual processing, which were linked to symptom reduction. The results highlight the importance of promoting conceptual processing, aided by increasing perceptual processing. Unfortunately, the stand-alone effects of ImRs were not determined. Arntz et al. (2007) suggested that that ImRs addresses a wider range of emotional and cognitive elements of the trauma than just exposure (Arntz & Weertman, 1999; Smucker & Niederee, 1995), which could facilitate conceptual processing. However Arntz (2012) proposed that a shift in processing alone could not explain changes in post-traumatic cognitions seen with ImRs.

Furthermore, Dibbetts and Arntz (2015) highlighted that ImRs elaborates and integrates the traumatic memory into a context in long-term autobiographical information, providing a time context, which decreases fear generalisation and the memory being triggered (Hackmann, 2011). This is in line with mechanisms of change suggested for PTSD treatment more generally (Ehlers & Clark, 2000).

Factors that create an effective rescript. It is important to consider how to create a clinically effective rescript, that is, examining the optimal therapeutic method (Arntz, 2012). Factors that increase effectiveness are likely to link to mechanisms of action in some form, such as memory change. Arntz (2012) suggested that change to the original memory due to ImRs may depend on reactivating the emotional memory and the kind of rescripting used. It has been proposed that retrieving the new rescript is aided by practising retrieval, the memorability of the rescript and a positivity bias (Wheatley et al., 2007). A recent case series design developed a coding scheme, which captured important factors of an ImRs session and applied this to six cases to examine how these factors related to treatment outcome. Links were tentatively suggested, as they were not statistically examined (Salter, 2014). Multiple factors were found to be related to improved outcome, including: attitude towards ImRs (participants needed to be motivated and engaged), activation of the image, ability to follow ImRs, activation of original and new internal processes (emotions, cognitions and physical sensations), believability and a change in attitude towards the original traumatic event. Other recent research examined the effectiveness of ImRs in treating survivor guilt and suggested factors that could increase effectiveness, however these were also not statistically examined (Medin, 2015). These included: therapists guiding the imagery; modifications being made directly to the imagery sequence; the imagery

being active but not overly vivid or emotionally charged; and the re-scripted image compelling and evoking new thoughts, feelings and sensations.

Addressing emotions and cognitions.

Accessing original emotions and cognitions. As previously mentioned, Arntz (2012) suggested that reactivating the emotional memory could be important in memory change, in line with promoting elaboration and contextualisation in PTSD treatment (Ehlers & Clark, 2000). Indeed, Salter (2014) suggested that the most symptom improvement after undergoing ImRs occurred when individuals experienced original internal processes not so intensely that they became highly distressed and not so minimally that processing was not facilitated. Other research has also demonstrated ImRs to facilitate access to original internal processes (Brewin et al., 2009), which is unsurprising considering research demonstrating a stronger link between images and emotions, than images and verbal material (Holmes et al., 2008; Holmes & Mathews, 2010). This raises the question of how much exposure to the original traumatic memory is necessary before rescripting occurs, to enable activation of emotions and cognitions. Kindt et al. (2007) suggested that the original memory should be activated to some extent to provide corrective information. However, Arntz et al. (2013) demonstrated pre-emptive rescripting to be effective, in which arguably fewer original emotions and cognitions might be activated. Wheatley and Hackmann (2011) stated that it does not seem necessary to relive the intrusive event in its entirety before rescripting, just moments of high affect and distressing meaning. Overall, therefore, it is important to consider further the extent to which activating original emotions and cognitions contributes to rescripting effectiveness.

Changing emotions and cognitions. It is likely that the effectiveness of ImRs is not due solely to accessing original emotions and cognitions, but rather shifting away from these and/or adding new, more positive, emotions and cognitions. In contrast to exposure, the premise of ImRs is to alter the outcome of a memory/image, changing associated emotions and cognitions to alleviate distress (Dibbets & Arntz, 2015). Smucker (1997) suggested that emotional and cognitive disturbances stemming from traumatic memories are strongly associated with intrusive images and therefore modifying these "becomes a powerful if not preferred means of processing the traumatic material" (Holmes et al., 2007, p.298). In line with this, Salter (2014) suggested that participants who could not create new internal processes or who only experienced a decrease in original internal processes during ImRs symptoms did not experience improvement.

Regarding emotions, Holmes et al. (2007) stated that imagery techniques in CBT draw on the premise that imagery affects emotion (Holmes et al., 2008; Holmes & Mathews, 2010) and that this can therefore be a powerful tool in alleviating distress. Research has already demonstrated ImRs to be effective in changing an individual's emotions. Arntz et al. (2007) found that when treating PTSD, IE and ImRs combined had better outcomes for emotions other than fear, than IE alone. Furthermore, Rusch et al. (2000) found that ImRs created a positive change in participants' affect, perhaps due to many individuals choosing to create humorous or absurd rescripts. They suggested that these positive rescripts could promote inhibition of associated negative affect (Wolpe, 1958; 1995). If ImRs has a positive effect on emotions, it is clearly important to determine if certain emotions are particularly effective to include, to promote greater therapeutic gains. It has been suggested that obtaining a sense of

control or mastery in the rescript is important (Rusch et al., 2000; Wheatley et al., 2007, Wheatley & Hackmann, 2011). For example, seeking revenge against perpetrators in imagery can increase feelings of control (Holmes et al., 2005), whilst not leading to increase in anger generally (Seebauer, Frob, Dubaschny, Schonberger, & Jacob, 2014), perhaps due to satisfying rather than suppressing this need (Arntz et al., 2007; Arntz, 2014). It has also been suggested that incorporating compassion can be therapeutically beneficial (Gilbert, 2005; Wheatley et al., 2007; Wheatley and Hackmann, 2011), perhaps particularly relevant for ImRs related to childhood trauma (Arntz & Weertman, 1999; Smucker et al., 1995). Importantly, generating compassion, even through imagery, has been found to activate neural pathways that will then be more readily activated in the future (Gilbert, 2005).

Regarding cognitions, standard treatment according to a cognitive model (Ehlers & Clark, 2000) involves accessing the meaning of traumatic events and updating this with information that challenges the maladaptive meaning (Ehlers et al., 2005; Wheatley & Hackmann, 2011). Wheatley and Hackmann (2011) proposed that ImRs does this but allows for "artistic license" (p.445) in modifying the memory, but state that the rescript should be closely related to key cognitions for it to be meaningful (albeit for depression). Research has demonstrated ImRs to change maladaptive cognitions. Long and Quevellion (2009) suggested that ImRs activates the traumatic memory and then changes trauma-related cognitions, which has been demonstrated in a range of presenting issues from social anxiety (Reimer & Moscovitch, 2015) to the experience of abuse in childhood (Smucker et al., 1995). When treating trauma related nightmares, it was found that exposure, relaxation and rescripting therapy resulted in improvements in traumatic cognitions, still evident six months later. This was linked

to an improvement in PTSD symptoms, however causality and the stand-alone effectiveness of ImRs were not established (Long et al., 2011). In line with basic CBT concepts, it is likely that change in emotions is linked with a change in cognitions, and visa versa. For example, by introducing a felt sense of compassion into an image, individuals may indirectly challenge cognitions such as 'I am worthless' (Hackmann, Bennett-Levy, & Holmes, 2011). However, further research is required to determine if certain emotions and cognitions are most effective to address in ImRs, as this currently remains unclear (Wheatley & Hackmann, 2011).

Increasing self-efficacy. Linked to cognition change, another important factor to consider when creating an effective rescript, or even as a mechanism of action itself, is self-efficacy. Self-efficacy is the belief that one has the means and abilities to produce desired effects through one's actions (Bandura, 1977). As mentioned, Long et al. (2011) found that a treatment incorporating ImRs resulted in a decrease in traumatic cognitions, associated with a decrease in PTSD symptoms, which had the strongest relationship with a decrease in a perception of incompetence measure. They suggested therefore that a mechanism of action of ImRs could be change to cognitions, but particularly those relating to one's own ability and/or judgement. It is possible, therefore, that a sense of self-efficacy gained through ImRs could contribute to therapeutic change. Firstly, this could be considered in relation to control over intrusive mental images. Long et al. (2011) highlighted that poor image control has been linked to anxiety disorders, such as PTSD, and therefore it is possible that low self-efficacy in controlling images could lead to continued distress. Rusch et al. (2000) noted that ImRs differs from other imagery techniques as individuals largely decide on their own changes to images and suggested that this control may then be

utilised more broadly, resulting in further positive emotions and outcomes. This is likely to be increased by developing a sense of mastery and self-efficacy in the images themselves, probably in stark contrast with experiences during the traumatic event (Smucker et al., 1995). Secondly, it is possible that increasing self-efficacy in using certain emotions within rescripts could translate to doing this more generally. For example, Smucker et al. (1995) found that utilising compassion in rescripts resulted in an increased ability to self-soothe, both during and outside of sessions.

Meeting unmet needs. Arntz (2012) highlighted the importance of individuals being able to express needs, feelings and actions that were inhibited at the time of the trauma, often to ensure survival. Arntz (2011) suggested that this may promote emotional and cognitive processing and healing, a concept proposed by experiential therapies (Edwards, 2007). Indeed, early imagery work utilised this concept, for example, Perls (1973) encouraged individuals to express unmet needs through imagery to decrease cognitive and emotional avoidance. Meeting emotional needs through imagery is particularly discussed in the literature in relation to 'type b' techniques, through changing underlying schemas resulting from needs not being met in childhood (Arntz, 2011). However meeting these needs is also relevant for 'type a' techniques too (Hackmann, 2011). Arntz (2012) even suggested that this might act as a mechanism of action for ImRs.

Considering the nature of the image. When creating an effective rescript it is likely to be important to consider factors related to the image itself, such as vividness and perspective. Vividness can be defined 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, Heyes, & Holmes, 2013, p.7). Research has suggested that the vividness of an image is linked to detailed sensory representations stored in memory (Baddeley & Andrade, 1998). A neuroimaging study found image vividness in different modalities was linked to higher activation in the same brain areas as perception in that modality (Belardinelli et al., 2009). Other therapeutic approaches also utilise the vividness of mental images, for example, EMDR harnesses visual working memory capacity to interrupt the vividness of the traumatic memory (Arntz, 2012), as does the aforementioned 'cognitive vaccine' (Holmes et al., 2009, p.1). It is possible, therefore, that the vivid nature of the image could be linked to ImRs effectiveness. It has also been suggested that the more vivid an image, the easier it is to recall (Cornoldi, de Beni, Cavedon, & Mazzoni, 1992) and that the more something is recalled, the easier it is to do so in the future (Tversky & Khaneman, 1973), which would clearly be beneficial for the effectiveness of ImRs long-term. In support of this, Salter (2014) tentatively suggested that participants who could not vividly imagine the rescript did not demonstrate symptom improvement. A further factor to consider could be the perspective from which the individual views the rescript (Salter, 2014). Viewing a traumatic memory from a 'field perspective', as if re-living it, rather than from an 'observer perspective' (Nigro & Neisser, 1983), has been found to result in emotional, physiological and psychological reactions more in line with those at the time of the trauma (McIsaac & Eich, 2004). It has been suggested that experiencing these could facilitate emotional processing of the memory (Rachman, 1980), whereas an observer perspective could be used to reduce emotion (Brewin et al., 2010; McIsaac & Eich, 2004). Therefore, the perspective adopted during the rescript could affect access to original emotions and cognitions, and perhaps then the ability to

change these. However, there is a lack of research into factors linked to the nature of the rescript during ImRs directly, so the proposed are possibilities only which should be examined further.

Summary: Links to memory change. Multiple factors have been proposed that could potentially be linked to the effectiveness of ImRs such as accessing and changing emotions and cognitions, meeting unmet needs, increasing self-efficacy, and adapting the rescript itself. It is complex, however, to ascertain whether these factors are linked directly to memory change or are mechanisms of action in their own right, such as changing emotions and self-efficacy. Furthermore, it is unclear whether these factors support the idea that ImRs facilitates a change in the original memory (Arntz, 2012) or the creation of a more accessible alternative memory (Brewin, 2006; Brewin et al., 2010). For example, in relation to emotional and cognitive change, emotional processing theory (Foa & Kozack, 1986; Foa et al., 1989) would propose that the original traumatic memory is activated and new, adaptive emotions and cognitions are incorporated into the fear network. Arntz (2012) would suggest a similar mechanism of action, with new information changing the meaning through 're-evaluating' the US. In contrast, Brewin (2006) and Brewin et al. (2010) would propose that new, adaptive emotions and cognitions create a new memory representation, which inhibits the original traumatic memory and associated negative arousal. In relation to factors related to the rescript, such as vividness and perspective, it could be argued that these create a more emotional and memorable rescript, likely to promote reconsolidation of the traumatic memory (Arntz, 2012). Conversely, these could increase the accessibility of the alternative memory, resulting in it winning retrieval competition (Brewin, 2006; Brewin et al., 2010).

In fact, there currently appear to be few ways to empirically test which theory of memory underlies ImRs, and indeed it could be a combination of both. Arntz (2012) suggested that the classical conditioning return of fear paradigm could be utilised to examine this further, as it is predicted that there will be less return of fear with context change if ImRs changes the US-representation itself, instead of forming a competing memory trace. This is yet to be extensively examined however.

Present Study

It is clear that there is much still to learn about the optimal therapeutic method, the underlying processes, and the links between these in ImRs (Arntz, 2012). An increased understanding of this will improve future clinical effectiveness. Arntz (2012) even proposed "fundamental studies should be done to unravel what the underlying processes [of ImRs] are" (p.203). Research exploring this is in its infancy (Arntz, 2012) and there appear to be limited ways to clearly examine underlying mechanisms of ImRs and therefore this study aimed to address this gap in the literature.

Qualitative approach. Qualitative methods are often adopted in areas where the literature is in its infancy, to gain a rich and detailed understanding of a phenomenon, through examining individual perspectives. To the author's knowledge a qualitative study is yet to examine ImRs specifically, gaining a perspective from 'the inside out', in a way that quantitative studies cannot. A 'Psych Info' and 'Web of Science' search using the terms 'imagery rescripting' and 'qualitative' returned four and three results respectively, only two of which were qualitative research studies

examining ImRs and PTSD. One examined the experience of imagery techniques of individuals with a PD diagnosis, in preparation for ImRs (ten Napel-Schutz, Abma, Bamelis, & Arntz, 2011). They found that whilst participants felt imagery was valuable, more attention should have been paid to the emotional impact, supplying sufficient information, and the unpredictable nature of the duration of imagery exercises. The other paper was a dissertation, which examined the relationship between imagery rescripting and emotional processing of traumatic incest, finding a positive relationship (Agbuis, 1996). Neither study examined effectiveness factors and mechanisms of action of ImRs and neither used a Grounded Theory (GT) approach.

Examining the first hand, subjective experience of individuals who had undergone ImRs could suggest factors that contribute to an effective rescript. For example, did participants experience change in their emotions, thoughts, both or neither? Was this important to them for therapeutic change? Information could also be gained regarding individuals' subjective experience of the more fundamental mechanisms of action, such as memory change, which could be hard to elucidate through quantitative research. For example, did they experience a traumatic memory that had changed, two competing alternative memories, both, or neither? Information on links between effectiveness factors and mechanisms of action could also be suggested. Importantly, the use of GT allowed this rich description to be summarised in a model. With this in mind, 10 participants who had completed ImRs as part of their treatment for PTSD were interviewed, to address the following research questions.

Research questions. The research questions were to explore individuals' experience of ImRs in PTSD treatment, to consider factors that influenced its effectiveness and potential mechanisms of action, relative to what is proposed by existing theory. A model is proposed, aiming to increase theoretical understanding of ImRs, and so in turn, increase clinical effectiveness.

Chapter 2: Method

Participants

Sample. Ten participants were recruited by therapists at a London-based trauma service (n = 10, mean age = 47, males = four, females = six). Participants were either current clients or clients who had been discharged within the last 18 months. The criteria set for time since discharge was initially six months, to promote clarity of recall when answering the interview questions. However, the two initial pilot interviews were with participants who had been discharged over six months ago and therefore had completed the ImRs technique even longer ago. No deterioration in the detail recalled regarding the technique was evident and therefore they were included in the results and the time since discharge criteria was expanded to 18 months. Initial sampling was completed in line with the inclusion/exclusion criteria and clinical judgement, followed by theoretical sampling, in line with a GT methodology (Charmaz, 2014) (see design and analysis section). However, due to time constraints imposed on the study it was not possible to adequately adopt theoretical sampling and therefore obtain theoretical sufficiency (Dey, 1999). All potential participants contacted by therapists gave consent to be contacted by the researcher and all subsequently agreed to take part in the study. See Table 1 and 2 for demographic and clinical information, and questionnaire scores respectively. The questionnaires used to situate the sample were those used most regularly in the service at the time of the study, the Posttraumatic Stress Diagnostic Scale (PDS; Foa, 1995) and the Beck Depression Inventory-II (BDI-II; Beck, Steer, & Brown, 1996).

Inclusion and exclusion criteria. Inclusion criteria regarding PTSD diagnosis and treatment included: a) experience of one or more traumatic events in adulthood resulting in PTSD (defined by DSM-V; APA, 2013), b) a primary diagnosis of PTSD (all levels of psychopathology at the time of ImRs and currently were included), c) currently receiving or having received (no more than 18-months post discharge) treatment for PTSD at the trauma service, d) having undertaken a memory-reliving component of treatment, e) having undertaken an ImRs component of treatment to address a minimum of one 'target memory'. Inclusion criteria regarding timing of the ImRs intervention included: f) a minimum of one-month delay following completing ImRs for the first 'target memory' before the interview was conducted, g) able to recall enough information about ImRs to answer interview questions. The last criterion was changed from an initial time frame of 12 months. This was due to it becoming clear in the two initial pilot interviews that no deterioration in the detail gained regarding the technique was evident when participants had been discharged within 18 months and therefore completed ImRs even longer ago.

It was initially assumed that the interviews would focus largely on rescripting of 'type a' images to adult trauma, due to the service criteria (see inclusion criterion a). However, throughout the study it became clear that two participants at least had also rescripted childhood traumas and discussed these in the interviews. The data from these interviews was still included as these interviews yielded rich and detailed information about the ImRs technique.

Exclusion criteria included: a) being currently suicidal, b) being currently psychotic, c) being currently dependent on illicit drugs or alcohol, d) not speaking sufficient English to understand the interview questions.

Table 1.
Sample demographics and clinical information.

Participant	Gender	Age at interview (years)	Ethnicity	Single, multiple, sustained trauma	Number of traumas resulting in PTSD symptoms	Time since index trauma at interview (years)	Clinician	Previous psychological input for PTSD	Total number of sessions at interview	Total number of ImRs sessions at interview	Time since last ImRs session at interview
P1	F	45-54	White British	Multiple Sustained	20	11	Core	Yes	134	10	18 months
P2	M	45-54	White British	Multiple	2	34	Core	No	22-core 20-core	4 known	Approximately 27 months
P3	M	25-34	Asian Indian	Multiple Sustained	20	7.5	Trainee Core	No	12-trainee 20-core	6	2 weeks
P4	F	35-44	Black African	Sustained	3 episodes	10	Core	No	42	15	4 months
P5	F	45-54	White Other	Multiple	2	18	Core	No	196	40	1 month
P6	M	45-54	White British	Single	1	3 years 9 months	Core	Yes	24	6	9 months
P7	M	45-54	Black African	Multiple Sustained	30	33	Core	No	70	10	12 months
P8	F	55-64	Any other group	Sustained	Unknown	14	Core	Yes	12	3	1 month
P9	F	45-54	White Other	Sustained	>13	Approximately 16	Core	Yes	194	Unknown	10 days
P10	F	35-44	White British	Multiple	2	33	Core	No	33	13	Approximately 2 weeks

Table 2.
Questionnaire scores: Pre and post treatment.

Participant	The Post-traumatic Stress Diagnostic Scale (PDS)			The Beck Depression Inventory (BDI-II)		
	Pre	**Post**	**Change**	**Pre**	**Post**	**Change**
P1	36	24	-12 (severe to moderate-severe)	44	23	-21 (severe to moderate)
P2	42	41	-1 (remained severe)	50	43	-7 (remained severe)
P3	44	Still in treatment	-	55	Still in treatment	-
P4	50	Still in treatment	-	55	Still in treatment	-
P5	Not completed	Still in treatment	-	Not completed	Still in treatment	-
P6	48	Not completed	-	37	6	-31 (severe to minimal)
P7	39	21	-18 (severe to moderate-severe)	36	10	-26 (severe to minimal)
P8	45	Still in treatment	-	41	Still in treatment	-
P9	47	Still in treatment	-	41	Still in treatment	-
P10	37	Still in treatment	-	29	Still in treatment	-

Ethical considerations. The study was considered appropriate for proportionate review and the National Research Ethics Service North West Preston Research Ethics Committee granted approval on the 5th of October 2015. The local Research and Development department granted approval on the 18th of November 2015 and subsequently the Royal Holloway University of London Departmental Ethics Committee granted approval on the 4th of December 2015 (Appendices 1-4).

Potential participants were provided with sufficient information to make an informed decision about participating and were made aware of their right to withdraw at any time, without giving a reason, and without it affecting their current or future care in any way. Participants' information remained confidential throughout the study, with therapists identifying potential participants, who were only contacted by the researcher if consent was provided. Participants' data was stored separately to their names, using participant numbers. Participants were informed prior to the interview that if risk issues arose the researcher would break confidentiality and discuss this with a therapist and/or inform relevant services. This occurred in one interview and the risk management protocol was followed appropriately. Managing participants' distress was carefully considered and participants were repeatedly reminded that they did not need to discuss the traumatic event(s) if they did not wish to. If participants became distressed they were reminded that they did not have to answer every question and could withdraw at any time. A debrief occurred and if they remained distressed therapists were available to discuss this. Likelihood of distress was given close consideration, with research suggesting participation is generally well tolerated in those who have experienced trauma (Griffin, Resick, Waldrop, & Mechanic, 2003).

The information sheet provided to participants detailed these ethical considerations (Appendix 5).

Design and Analysis

The study adopted a cross-sectional, qualitative, semi-structured interview design. GT, specifically Charmaz's (2000) constructivist approach, was chosen as the methodology.

Choice of methodology. A qualitative analysis approach was adopted to enable an exploratory, in depth, rich analysis of participants' experiences of the ImRs technique. Considering the lack of research into the mechanisms of action underlying the technique and factors that moderate its effectiveness, a qualitative approach was chosen for its ability to "uncover and understand what lies behind any phenomenon about which little is yet known" (Strauss & Corbin, 1990, p.19).

GT. GT originates from sociology and social interactionism and begins by examining individuals' experiences and moves towards conceptual categories as explanations of the data (Charmaz, 2003). The aim of GT is to produce a framework to aid understanding of a phenomenon (Willig, 2001). GT was first introduced by Glaser and Strauss (1967) and promoted "the discovery of theory from data" (p.1), rather than the testing of existing theories. They proposed that theories exist to be discovered, rather than created, in line with a positivist approach. Charmaz (2014) describes this as objectivist GT, which assumes an external reality and discovery of data. Following the original publication, Glaser (1992) continued to describe a non-prescriptive and flexible version of GT. In contrast, Strauss and Corbin (1990; 1998)

proposed a more prescriptive version of GT (utilising coding paradigms) and importantly acknowledged that researchers could be influenced by existing theories (Charmaz, 2014). Subsequently, Charmaz (1990; 2000) proposed a constructivist version of GT, in contrast to Glaser's (1992) and differing from Strauss and Corbin's (1990; 1998) approaches. Constructivist GT acknowledges the researcher's subjective involvement in constructing and interpreting the emerging data and resulting theory (Charmaz, 2014). The theory created therefore is one possible view of the data, not the only truth, more in line with an interpretive approach and subjective GT, which assumes multiple realities and construction of data through interaction (Charmaz, 2014). Charmaz (1990) stated that the researcher brings to the study "the general perspective of their disciplines, their own philosophical, theoretical, substantive, and methodological proclivities, their particular research interests, and their biographies" (p.1170).

Rationale for using GT. The aims of the study were to gain an understanding of the experience of the ImRs technique as part of treatment for PTSD from those who have gone through it, including what made it more or less effective, relative to what is proposed by existing theory. GT enables researchers to "examine what is happening, or has happened in studied phenomena" (Morse et al., 2009, p.13), and is therefore an appropriate method to examine the processes underlying a technique. Importantly, GT generates theories with explanatory power to examine an inherent process, rather than just identifying themes of unstructured subjective experience (Birks & Mills, 2011).

Although GT initially appeared to address the research questions, other qualitative methods, such as Interpretative Phenomenological Analysis (IPA) were considered. IPA stems from a philosophical position and examines the meanings that different experiences, events and states have for individuals and how they make sense of their personal and social worlds (Smith, Flowers, & Osborn, 1997). The researcher attempts to gain an insider perspective (Conrad, 1987), whilst acknowledging a 'double heuristic', that is, participants are trying to make sense of their world, while the researcher is trying to make sense of the participants' attempts to make sense of their world (Smith, et al., 1997). IPA focuses on the experiences and changes in experiences for an individual, as interpreted by the researcher, however does not provide an explanation for this, which could curtail understanding of a phenomena (Willig, 2001). Furthermore, it is not used to construct theory, as Larkin and Thompson (2012) stated, "the purpose is exploratory rather than explanatory" (p.103). It was felt therefore that GT was best suited to address the research questions.

Rationale for using constructivist GT. Charmaz's (2000) constructivist GT was adopted for multiple reasons. Firstly, the researcher felt that it was important to account for their prior knowledge of the area and resulting assumptions. To be able to be transparent about the potential influence of these upon the data and resulting theoretical model was felt to be essential. Secondly, Charmaz (2006) highlighted the importance of using GT flexibly, unlike previous versions. A constructivist approach allows making use of existing theory to partially inform interview questions and also takes into consideration certain confines of the study, such as time limitations.

Position of the researcher and reflexivity. In line with a constructivist approach, the researcher reflected on how their background, knowledge, assumptions and perspectives may have affected the data and resulting theoretical model. The researcher was a female trainee Clinical Psychologist, who had not carried out qualitative research prior to this study. Unlike participants, the researcher had not experienced a severe traumatic event and therefore had not undergone treatment for PTSD. Whilst conducting the study the researcher was working in a trauma service, had received training and supervision on ImRs and had used the ImRs technique in clinical sessions. The researcher therefore had a clinical interest in the area and knowledge of the literature before entering the field, including having completed a literature review. As a result of this the researcher had ideas about the potential mechanisms of action of ImRs, such as changes in memory (e.g., dual representation theory [Brewin et al., 2010] and re-evaluation of an unconditioned stimulus [Arntz, 2012]), changes in cognitions and/or emotions, and this was used as a basis for the interview questions.

While early GT largely suggested the researcher should be separate from the data, Glaser and Strauss (1967) did acknowledge, "the researcher does not approach reality as a tabula rasa" (p.3). Harper (2013) suggested that the process of trainee researchers reading literature can stimulate curiosity, support appropriate questioning and avoid narrow analysis. He proposed that what was essential was for researchers to be transparent about their assumptions, with awareness of these assumptions in fact aided by knowing the literature. Corbin and Strauss (2008) stated that experience and understanding could result in researchers being more in tune with participants, allowing a greater insight. Bulmer (1979) suggested that a resolution is to view a

theory as a constant 'flip-flop' between ideas and research experience and that 'sensitising concepts' provide initial ideas to pursue in research. The researcher however ensured that these sensitising concepts were "a place to start inquiry, not to end it" (Charmaz, 2014, p.31) and that existing ideas did not prevent them from seeing things that did not fit with these (Corbin & Strauss, 2008).

To minimise the impact of this prior knowledge the researcher kept a reflective research diary throughout the study and consistently reflected on their position in relation to and influence on the data (Appendix 6). This was discussed in both individual and peer research supervision.

Theoretical sensitivity. Linked to reflexivity is the concept of theoretical sensitivity (Glaser & Strauss, 1967). Strauss and Corbin (1990) suggested that theoretical sensitivity is an awareness of the subtleties and meaning of the data. This comes from an understanding of the literature, professional and personal experience and from the research process itself. Theoretical sensitivity involves the ability to recognise that the data has relevance for the emerging theory, which should increase as the research progresses (Birks & Mills, 2011).

Theoretical sampling and theoretical saturation. GT suggests a theoretical sampling approach, whereby sampling and data analysis occur concurrently, with sampling decisions based on the ability of the data to add to the developing theory, by elaborating and refining categories (Charmaz, 2014; Glaser & Strauss, 1967). Theoretical saturation is the point at which it is felt that gathering more data about a theoretical category would reveal no new properties or theoretical insights (Charmaz,

2014). The meaning of saturation has long been discussed (Morse, 2011) and has been suggested to be a judgement that takes into account the research situation, including time constraints (Wiener, 2007). Dey (1999) suggested 'theoretical sufficiency' (p.257) as a more appropriate term, as while it also suggests thorough analysis, it does not claim exhaustive completion of category generation. This concept was therefore adopted in this study.

Following therapists initially sampling in line with inclusion/exclusion criteria, theoretical sampling was then considered. The researcher met with the research supervisor regularly during the research process to discuss the on-going analysis and implications for theoretical sampling, which was adopted where possible. For example, participants were recruited with varied experiences of the effectiveness of ImRs to generally explore effectiveness factors. Furthermore, participants were recruited with a range of time having elapsed since completing ImRs, to explore any changes in effectiveness over time. However, due to time constraints it was not possible to adequately adopt theoretical sampling to explore and saturate emerging categories, and therefore claims of theoretical sufficiency cannot be made.

Data collection. GT allows for multiple approaches to data collection, such as interviews, ethnography and documents (Charmaz, 2014). Interviews were felt to be most appropriate to gain a rich and detailed understanding of participants' experience and allow the researcher to enquire further as information relevant to the research questions arose.

Interview schedule. The initial interview schedule was extensively developed with the research supervisors, aiming to explore participants' experience of ImRs with a particular focus on the potential underlying mechanisms of action of the technique (Appendix 7). As previously mentioned, prior knowledge guided the interview questions, with areas including: participants' experience of ImRs, the potential mechanisms of action of ImRs, the process of ImRs, the effectiveness of ImRs, and an enquiry if anything had not been covered. Charmaz (2014) suggested that novice researchers should develop a detailed interview guide, in line with Karp's (2009), suggestion that this sets out 'domains of inquiry' (p.40) and fundamental issues to cover.

Service user consultation. Three of the early interviews were conducted with members of the trauma service's service user action group. Two of these interviewees provided feedback regarding: whether the questions were understandable or confusing, if there was anything they would add given the aims of the study, if they felt the questions were distressing and any suggested changes to alleviate this. Feedback suggested that the questions were understandable and not unnecessarily distressing. One participant suggested it would be helpful to have a clearer definition of ImRs before beginning the interviews, which was adopted for future interviews. The two initial interviews conducted with members of the service action group were considered as 'pilot interviews' to check the suitability of the interview questions. However these were subsequently included in the analysis as it was felt that the initial interview schedule questions were appropriately addressing the research questions, despite smaller changes being made following feedback.

Adapting the interview schedule. The interview schedule was considered after each interview and adapted if necessary, in line with the GT approach (Charmaz, 2014). For example, following five interviews it became clear that participants often discussed the original traumatic memory and the rescripted memory as separate entities and so questions were added to explore the nature of this delineation further (Appendix 8).

Interviews. Interviews consisted of an approximately five-minute introduction to answer any remaining questions and obtain written informed consent (Appendix 9), the interview with an average length of 90 minutes, and an approximately five-minute debrief. All interviews were conducted at the trauma service in a private room and were audio-recorded with written consent. The interview schedule was used as a guide only and the researcher was flexible in questioning to create a sensitive interaction considering individuals' experiences and preferences (Hugh-Jones & Gibson, 2012). 'Out of pocket' travel expenses were to be paid for participants, if they were not travelling to the service that day anyway, however no participants requested this.

Post interviews. Participants were also asked prior to the interview for consent to allow the researcher to obtain demographic and clinical information from their therapist (Tables 1 and 2 and Appendix 10), which was collected following the interview. Participants were also asked prior to the interview if they would like to be contacted at a later date to provide feedback on an initial model and all 10 participants agreed to this. A brief summary of the results and an initial model were sent to all participants (Appendix 11). However, no participants responded with feedback in the

time available and so this could not be incorporated. Participants were also sent a summary of the results post completion of the study if they requested this at the interview. If participants consented, a letter informing their General Practitioner of their participation in the study was sent (Appendix 12).

Data analysis.

Transcribing. All interviews were transcribed verbatim by the researcher, to become immersed in the data, to provide ideas and understanding, and to give an opportunity to look again at the interview in detail (Charmaz, 2014). Transcription was completed as soon as possible following each interview to allow theoretical sampling to be considered. Once transcribed, the audio recording was securely deleted. Guidelines for transcribing were followed (McLellan, MacQueen, & Neidig, 2003).

Coding. Following transcription, the interview was coded, that is, "to stop and ask analytic questions of the data we have gathered" (Charmaz, 2014, p.109). Coding involves naming/labelling segments of data that categorises, summarises and accounts for it (Charmaz, 2014). This process links collecting data and generating theory. Charmaz (2014) suggests that GT coding consists at a minimum of 1) initial coding, 2) focused coding and that 3) theoretical coding can be utilised if the data indicates. The coding procedure adopted in this study is outlined below.

Stage one: Initial coding. Initial coding includes naming each word, line or segment of data simply and precisely. Charmaz (2014) recommends line-by-line coding and this approach was therefore adopted in this study. Four questions were

asked during initial coding: 1) what is this data a study of, 2) what does the data suggest, pronounce or leave unsaid, 3) from whose point of view, and 4) what theoretical category does this data indicate (Charmaz, 2014). Gerunds (verbs) were used when coding to promote staying grounded in the data, therefore remaining open to all theoretical directions, rather than imposing existing assumptions and ideas. In-vivo codes were also used, by paying close attention to participants' language, and coding special terms used, to retain their meaning (Charmaz, 2014). During initial coding any gaps in the data were observed, to suggest later directions for theoretical sampling.

Stage two: Focused coding. Focused coding involves ascertaining the most frequent or significant initial codes and testing these with larger amounts of data. To do this, decisions were made regarding which initial codes should be used to categorise the data (Charmaz, 2014). Birks and Mills (2011) suggested that the researcher should identify explanatory and conceptual patterns in the data at this stage. These codes should be those with more theoretical power, direction and centrality (Charmaz, 2014). Glaser (1978) suggested that focused codes are more conceptual than initial codes. It was important to take a critical but unbiased view of initial codes and their development into focused codes, to prevent forcing the data, in line with preconceived ideas (Charmaz, 2014).

Stage three: Theoretical coding and diagramming. Theoretical codes were utilised in this study as the next step in the GT analysis. Theoretical codes organised focused codes into categories to enable a theoretical model to be developed. Charmaz

(2014) described this as telling "an analytic story that has coherence" (p.150). A model that represents the emergent findings was generated (Figure 2).

Memos and constant comparative analysis. Memos are analytic notes about the data, that is, written records of a researcher's thinking throughout a GT study (Birks & Mills, 2011). Memos were written throughout the study to capture the researcher's thoughts and reflections and aid in developing a model (Appendix 6). Memos were used as the tool for constant comparative analysis at every coding phase, the process of constantly comparing the emergent analysis for similarities and differences – "incident to incident, incident to codes, codes to codes, codes to categories and categories to categories" (Birks & Mills, 2011, p.11). This also later enabled theoretical saturation, or sufficiency (Dey, 1999), to be considered.

Research quality. Guidelines for quality in qualitative research were followed throughout the study as a quality control measure (Elliot, Fischer, & Rennie, 1999). The researcher carefully considered their theoretical and personal perspective on the research before commencing the study. Through writing a reflective research diary and discussing this in supervision, the researcher remained mindful of how these perspectives could construct and contribute to the data and emerging model ('owning your own perspective') (Appendix 6). To provide a context and enable the reader to judge the relevance of the findings, detailed demographic and clinical information was collected to situate the sample (Tables 1 and 2) ('situating the sample'). To make transparent the fit between the data and subsequent understanding and also enable readers to consider alternative understandings, extracts are provided of the research diary, memos, transcribed interviews and coding (Appendices 6 and 13) ('grounding

in examples'). Multiple approaches were used to provide credibility checks. Firstly, the research supervisors, who had extensive knowledge of the area, read the first three transcribed interviews. It was decided that the interview schedule was appropriately addressing the research questions. Secondly, triangulation methods were used to check the codes, with the research supervisors looking over the initial codes for two interviews to check the codes were grounded in the data. A trainee working in a similar area also coded a section of the first interview and this was cross-checked with the researcher's codes. These codes were sufficiently similar, which suggested the researcher was not missing important information and the codes were a good fit with the data. Thirdly, the researcher also met with a peer supervision group, which included practicing and comparing codes to determine an appropriate understanding of the coding procedure. Fourthly, following the development of a model, 10 participants were contacted to provide feedback, however feedback was not provided in time to be incorporated in the findings ('providing credibility checks'). To ensure a coherent understanding of the data that resonated with the reader, quotes were provided for codes, research supervisors and a trainee checked the emerging codes, and participants were asked to provide feedback ('coherence' and 'resonating with the reader'). Strauss and Corbin (1998) suggested that theoretical concepts should be applicable and recognised by participants, even if the final model does not fit all aspects of their experience.

Procedure

Pre-recruitment stage. Typical treatment for PTSD at the trauma service involves assessment, formulation, goal setting, IE, and then ImRs if clinically indicated. ImRs can last from one session to multiple sessions over months, with

rescripting one image taking approximately two to five sessions. ImRs involves individuals giving an oral narrative of their intrusive memory/image and their therapist asking them what they would like to change and/or what they need. Following this, an alternative image is created to incorporate this. This image is modified as necessary in future sessions and individuals practice bringing this image to mind between sessions.

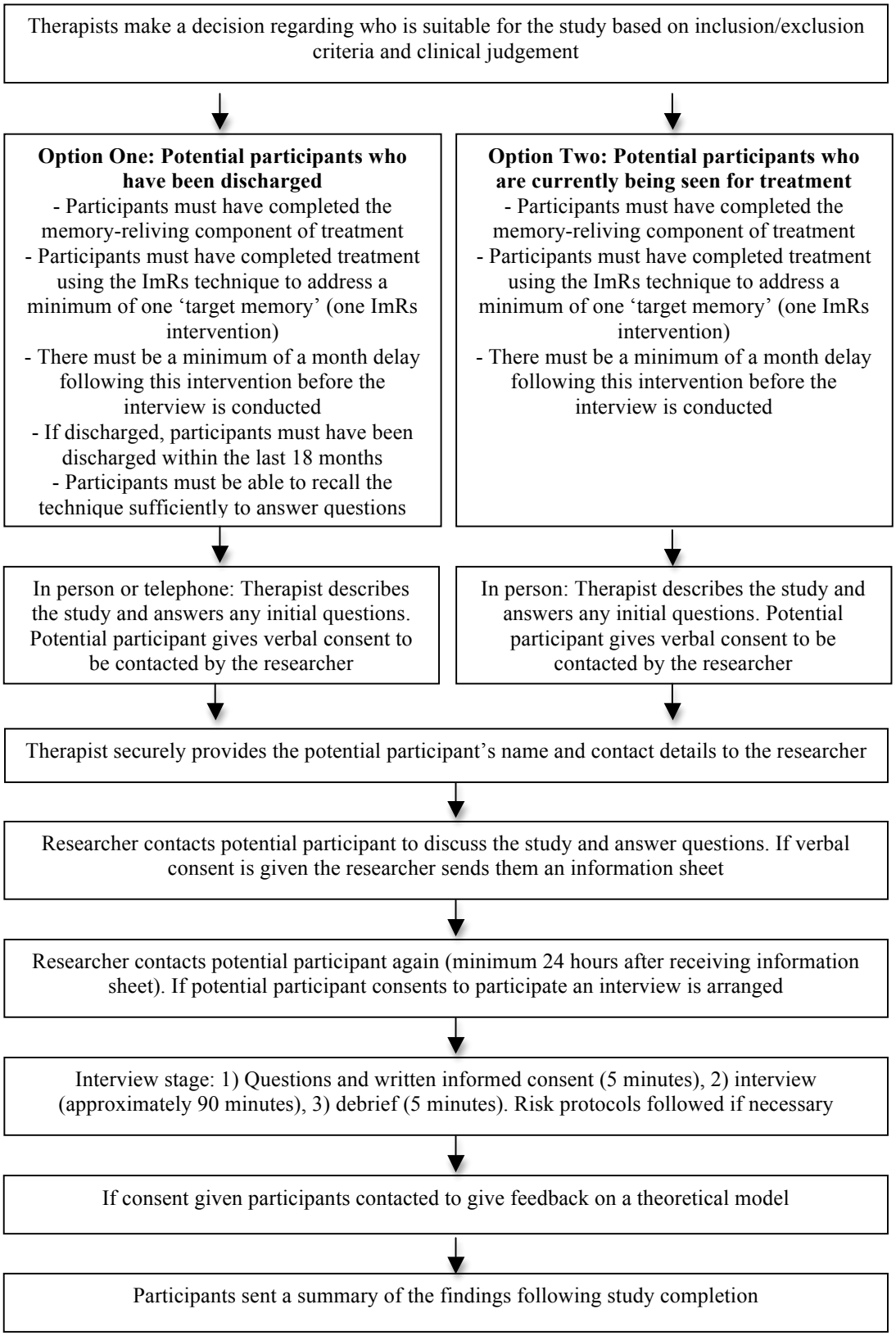
Recruitment stage.

Recruitment setting. Participants were recruited from a London-based trauma service between December 2015 and April 2016. Individuals accepted into the service are over 18 years old, have experienced one or more traumatic events in adulthood and have been diagnosed with PTSD (as defined by DSM-V, APA, 2013). The service offers specialist outpatient assessment, psychological treatment (TF-CBT and EMDR) and consultation.

Recruitment process. Therapists at the trauma service conducted initial screening of potential participants based on inclusion/exclusion criteria and clinical judgement. Clinical judgement largely refers to clinicians' knowledge of potential participants who met the inclusion/exclusion criteria. For example, clinical judgement was necessary when determining potential participants who it was felt would recall enough information about ImRs to answer interview questions. Furthermore, clinical judgement was also used to exclude clients who it was felt would find the interview process detrimentally distressing. While this may have resulted in a different sample than if all those who had completed ImRs were invited to interview it was felt necessary both due to time restraints and ethically. Therapists either discussed the

study with potential participants or contacted those who had been discharged within the last 18 months. If the potential participant gave verbal consent, the therapist securely provided their name and contact details to the researcher. The researcher then contacted the potential participant to discuss the study and sent them an information sheet (Appendix 5). The potential participant was then given time to consider whether they would like to participate, a minimum of 24 hours following receiving the information sheet. The researcher then contacted them again to answer any questions and gain verbal consent to meet for an interview, if the potential participant chose to take part. Written informed consent was gained at the beginning of the interview by the researcher (Appendix 9). The interview was then conducted, followed by time to debrief. If participants consented, an initial theoretical model was also sent to them to provide feedback at a later date. See Figure 1 for a diagrammatic representation of the study.

Figure 1.
A Diagrammatic Representation of the Study.



Chapter 3: Results

Overview

Nine theoretical codes emerged from the data during the final coding stage, consisting of 34 focused codes generated in an intermediate coding stage, consisting of initial codes generated at the first coding stage (Table 3). These codes related to either potential fundamental mechanisms of action or factors that moderated the effectiveness of ImRs. The effectiveness factors are presented in an approximate temporal order, including pre, during and post ImRs session stages, although inevitably there will be overlap between these stages. For example, it is acknowledged that 'importance of general imagery ability' (focused code 2.1) could be considered a pre-ImRs factor also. Therefore, it is helpful to consider 'during ImRs' effectiveness factors as factors present at the point of rescripting. Quotes are presented to illustrate each focused code and demonstrate how the codes are grounded in the data[1]. A model has been developed to summarise the potential fundamental mechanisms and factors that moderated the effectiveness of ImRs (Figure 2).

Confidentiality

All identifying information has been removed from the quotes to preserve participants' anonymity. Two participants requested to see a list of potential quotes following transcription to further consider whether to provide consent for these to be included. Quotes were then included, or not, in line with this. Participants are also referred to with a participant number throughout.

[1] Words in an arrow bracket (e.g., <name>) are used for anonymity. Words in square brackets (e.g., *[imagery]*) have been added so that the quote can be easily understood. A string of dots (...) shows that a section of the quote has been removed to promote clarity.

Table 3.
Theoretical codes, focused codes and initial codes.

Theoretical Codes	Focused Codes	Initial Codes
Pre ImRs Session		
1. Factors preceding ImRs	1.1. Nature of the trauma memory	Linking increased time living with trauma memories with decreased ImRs success Perceiving more distressing memories as harder to change Identifying not having a complete memory as a barrier to ImRs
	1.2. Attitude towards treatment and change pre ImRs	Needing to want a solution to a problem Needing to accept the need for treatment Identifying commitment to the treatment process as important
	1.3. Attitude towards the ImRs technique pre ImRs	Needing to be open to the idea of ImRs for it to be effective Suggesting ImRs effectiveness depends on desire for it to work Needing to want to change the ending
During ImRs Session		
2. Individual differences	2.1. Importance of general imagery ability	Being aware of own visualisation abilities Identifying visualisation ability as a barrier to ImRs
	2.2. Ability to believe in the rescript	Struggling that the rescript is imagination not reality Struggling to believe the rescript is true Attempting to believe in the memory constantly

	2.3. Effect of mood	Noticing stress levels impact on ability to change ending Struggling to access rescript when low Disbelieving the rescript more when low Feeling low increasing the need to choose the happier ending
	2.4. Level of dissociation	Finding dissociation interferes with ImRs Identifying dissociation as main obstacle to ImRs
	2.5. Level of motivation	Highlighting perseverance as important Feeling motivated to practise at home to achieve positive outcomes Suggesting effectiveness depends on how much you want to believe in the rescript
	2.6. Metacognitive insight (mechanism of action)	Discovering the possibility of using imagination to change a memory Using the ability to tune in and out of memories/rescripts long-term to alleviate distress Choosing to take a new perspective rather than think of the past Linking change to memories to change in life more generally
	2.7. Level of self-efficacy (mechanism of action)	Feeling able to use the technique effectively Knowing when to and being able to change ending when feel in danger in memory Growing the confidence to change things autonomously in the rescript Having control over thought processes

3. The importance of the therapeutic structure	3.1. Timing of ImRs in the treatment process	Feeling ready to use rescripting after other therapeutic work Having a sense of right order of therapeutic techniques Feeling natural to move from reliving to rescripting Feeling it was necessary to complete reliving first
	3.2. Timing of the rescript in the memory	Wanting the rescript to have occurred earlier to have the support Needing rescript just before the worst moment to feel relevant Finding rescripting after the worst moment helpful Needing the contrast between threat and rescript for maximum effectiveness
	3.3. Viewing ImRs as part of a treatment package	Deciding that improvements are due to two types of rescripting, imagery and knowledge Using imagery rescript to reiterate cognitive updates Seeing imagery rescripting as part of a larger treatment process
4. The importance of the therapist	4.1. Trust in the therapist	Needing to trust the therapist for ImRs to be effective Identifying the therapeutic relationship as important for ImRs effectiveness
	4.2. Level of support and guidance with rescripting	Experiencing the rescript as joint endeavour with therapist Finding it easier and safer to rescript with

		therapist than alone Using therapist guidance to make decisions such as what and when to rescript
	4.3. Using the therapist's presence in the rescript	Wanting to not be alone in the rescript Finding it helpful for therapist to meet needs in the rescript Utilising therapist modelling in the rescript initially until confidence grows Experiencing the therapist changing the ending as helpful in childhood memories
5. Creating an effective rescript	5.1. Level of agency in choosing the rescript	Advising giving people agency to decide on the ending themselves Experiencing a personally generated idea creating the most powerful rescript Creating a rescript true to inner soul was important
	5.2. Optimal vividness	Needing vividness in the rescript Experiencing the sensory nature of the image as helpful Finding the rescript not clear but still experiencing effectiveness
	5.3. Optimal perspective	Experiencing field perspective as more helpful Attempting to achieve field perspective and failing Finding it helpful to observe the bad moments and progress to field perspective Feeling more in control in field perspective Needing to use field perspective to be the

		agent of change
6. Felt sense change mechanism	6.1. Changing emotions	Feeling less petrified in rescripted memory Needing something to balance the feeling of guilt Finding the rescript allows anger to be released
	6.2. Changing feeling states	Feeling safe, protected and less vulnerable in the rescript Feeling comfort and compassion in the rescript Gaining power and control in the rescript
	6.3. Completing behavioural urges	Being enabled to do things not possible at the time of the traumas Finding it helpful to complete actions not possible at the time of the trauma
	6.4. Generalising feeling and behaviour change to general life	Feeling less anger generally due to the rescript Viewing rescripting as a reminder of not being guilty Feeling able to deal with being alone more easily post rescripting
7. Memory change mechanism	7.1. Changing the original traumatic memory	Experiencing the trauma memory and the rescript as one Rewriting the trauma memory Viewing rescripting as permanently changing the trauma memory
	7.2. Creating an alternative better memory	Experiencing two separate memories, original and rescripted Feeling there are two memories

		Experiencing trauma memory remaining but having an alternative to focus on
	7.3. A change point in the memory	Experiencing a break in the memory Experiencing a cut-off between the trauma memory and the rescript
Post ImRs Session		
8. Long-term accessibility of the rescript	8.1. Automatically accessing the rescript	Experiencing rescript popping into mind automatically at difficult moments Consistently experiencing the trauma memory and rescript as combined
	8.2. Intentionally accessing the rescript	Effortfully trying to replace the trauma memory with the rescripted memory Attempting to access the rescript to prevent access of trauma memory Needing to decide to retrieve rescripted ending Finding the rescript cannot be grabbed if it is not already in mind
	8.3. Change in accessibility and strength of the rescript over time	Finding rescript is increasingly available over time Suggesting the power of the rescript will increase over time
9. Enhancing on-going use of ImRs	9.1. Rehearsing the rescript	Finding regular rescripting increases effectiveness Finding rehearsal increases accessibility Using the rescript regularly until it becomes second nature Needing a mind-set that practice is essential
	9.2. Developing rescripting skills	Achieving autonomy in rescripting

		Modifying rescript created in session to strengthen memory Utilising rescripting often after learning the skill
	9.3. Using rescripting aids	Finding it powerful to use objects/images to aid visualising Utilising drawings as cues increases effectiveness
	9.4. Using the rescripted image more broadly	Using the rescripted image more generally in life in addition to in the memory Sending the rescript 'mentally' to help/support others
	9.5. Attitude towards the ImRs technique post ImRs	Viewing the rescript as a lifeline Treasuring the rescripts Being encouraged by early rescripting successes linking to future rescripts

Pre ImRs Session

1. Factors preceding ImRs.

1.1. Nature of the trauma memory. Three participants felt that factors related to the traumatic memory itself moderated the effectiveness of ImRs. For example, participants suggested that the more temporally distant the traumatic event, the more familiar the memory was, and therefore the more difficult to imagine an alternative ending. Furthermore, it was suggested that the more distressing the traumatic memory, the harder it was to change.

"I've had this thirty odd years (...) it's not a new thing for me, erm, because I have them so often, flashbacks and memories and things (...) it's like driving down the same roads all the same time and going home you see, and suddenly you go a different way, it's kind of err err…it feels slightly alien, you know, it feels strange" (P2)

"particularly with childhood trauma that's been with people for a really long time um you know you need something of equal weight to balance that" (P10).

"it just seems that things are so, sort of, seared on my soul that it's very difficult to imagine some other way" (P2)

One participant felt that if the traumatic memory had gaps in it, and therefore felt incomplete, it was difficult to make changes during ImRs.

"if there are parts of the memory that you can't remember, where you don't have, so there are gaps in the story [it is a challenge for ImRs]" (P5)

1.2. Attitude towards treatment and change pre ImRs. Participants' attitudes prior to beginning ImRs were another factor linked to effectiveness in the pre ImRs stage. Participants suggested that to enable ImRs to be effective they needed to have a positive attitude to treatment and change generally. They felt an individual needed to feel able to accept the need for treatment, want a solution to a problem and be committed to the treatment process.

"an individual has first to accept that he she needs treatment so if you have, if you have a condition and you are given the tablets to take and you don't take the tablets, you won't, you won't get the benefit of the tablets" (P7)

"it all depends on an individual and how much (...) she or he wants to get a kind of a solution to that problem" (P7)

"your commitment to wanting to do it [makes it successful] because it's not easy and it probably makes it worse before it gets better" (P5)

1.3. Attitude towards the ImRs technique pre ImRs. Participants' attitudes regarding ImRs specifically also moderated its effectiveness. Participants shared that before beginning the technique they felt concerned regarding the prospect that ImRs was changing their memories, however later discovered that this was not their actual experience of the process. One participant in particular discussed the importance of

maintaining the accuracy of the memory in light of justice for the traumatic incident not being attained.

"I don't want to do that because that's just lying and that's not true" (P10)

"I found it a strange idea, I imagined it like you're altering your memory of the incident but that's not really what it's like" (P9)

"I felt that for a long time the only thing I had to hold on to was the accuracy of my memory in the face of people um not sort of not, never being able to get justice (...) I felt that I couldn't be dishonest, I felt that I couldn't go back and change something (...) it was almost like I had given myself a job to remember it accurately, the bits I could remember and I had to hold on to that" (P5)

Participants highlighted the importance of being open to the idea of ImRs and having a positive attitude towards changing the ending for ImRs to be effective.

"I think you do need to…open your mind and basically, you have to believe in what you're doing because it's not going to work otherwise" (P6)

"To accept first that they have this thing on their mind and they want to find another way of looking at things" (P7)

During ImRs Session

2. Individual differences. Within this theoretical code there are focused codes that can be conceptualised as moderators of effectiveness, such as imagery ability, ability to suspend disbelief, levels of dissociation and levels of motivation. There are also focused codes that could be conceptualised as mechanisms of action, for example metacognition and self-efficacy.

2.1. Importance of general imagery ability. Perhaps unsurprisingly, it was clear that individuals' general ability to use imagery moderated the effectiveness of ImRs. Participants generally had a clear sense of their own visualisation ability. One participant suggested that a poor visualisation ability was one of the main barriers to ImRs and had to utilise physical objects in therapy to alleviate this (focused code 9.3).

"I think mmm some people, and nothing to do with PTSD, some people say they can't imagine things very easily but ... I think I can do that relatively well" (P9)

"I really struggled with doing the visualisation um and ... to a point where we couldn't really progress at all" (P5)

2.2. Ability to believe in the rescript. Participants discussed the importance of believing in the rescript for it to be effective, that is, the need to suspend their disbelief. This focused code was adopted rather than 'believability of the rescript' as it was felt it better captured the varying personal ability to invest in and believe the rescripts, regardless of whether the scenario was possible in the constraints of time and space. Individual differences were found regarding whether participants wanted

the rescript to be realistic, "*I couldn't quite project err completely surreal image onto that" (P2),* or whether a surreal rescript was effective, "*none of my stuff is in any way realistic (laughs) all of it is completely fairyland, but I don't know…to me that's quite good" (P9)*. Therefore, participants' ability to suspend their disbelief was relevant whether the rescript was logically believable, or not. Multiple participants experienced difficulty in believing, struggling with the rescript being imagination not reality. One participant summarised the technique by stating *"you are going to tell me that this is a table when it is a chair" (P7).* However, it was clear that having high motivation and a desire to believe contributed to effectiveness of ImRs (focused code 2.5).

"the whole kind of rescripting thing did feel slightly false" (P2)

"I struggle with this is, ok this is happening now in my imagination but this is not the truth" (P4)

A sense of coherence and the rescript feeling right was important to be able to believe in the rescript. One participant emphasised the importance of *"emotional logic" (P10).*

"I think whether or not it happens real in time and place or is fantasy based, for me it's not so much either of those options, it's more you know that it's got that, in terms of my own narrative, that kind of emotional consistency and that emotional logic, that's what's felt important" (P10).

2.3. Effect of mood. The effect of mood at multiple stages in the ImRs process was relevant. It was suggested that higher stress levels resulted in increased difficulty in changing the ending initially. Furthermore, low mood resulted in difficulties in accessing the rescript (theoretical code 8) and a cycle was experienced whereby not being able to access the rescript then further increased low mood. Being low in mood also decreased the ability to believe in the rescript, which was detrimental to its effectiveness (focused code 2.2).

"I think when I'm particularly low sometimes I can't bring him in even if I look at a picture of him (...) he just sort of not there, which as I say makes me feel more anxious because I've erm, where's he gone or you know" (P1)

"I struggle sometimes I said that devil the stress comes and telling me this is not true, this is not fact, this is lie" (P4)

Conversely, one participant suggested that the lower they felt the more important it was to choose to think of the rescript and therefore they were more likely to do so. Another participant found that when they were feeling low the rescript was able to lift their mood.

"When I think you're at your lowest I think you know to be given an option, you're always going to choose the happy ending" (P6)

"I am stressed and like when I get stuck, if I, if I take this just for like a few minutes, to believe in a few minutes, it might just lift me or release me" (P4)

2.4. Level of dissociation. Only two participants discussed dissociation detrimentally affecting ImRs, however, it appeared significant to them. One participant identified this as the most prominent barrier to the technique, affecting their ability to visualise and resulting in a less well associated traumatic memory and rescript.

"*I think the main obstacle was the dissociation and just having no real control over that" (P5)*

"I was going through and I was changing it, still I know what happened to me, and so I just think about that and my mind goes back even though I'm changing it to something which is good erm for a good ending, but still my mind, still there" (P3)

Conversely, another participant experienced the ImRs process as holding both the original memory and the rescript in mind alongside each other and *"trying to feed in the new one" (P7),* which prevented dissociation for them as they were engaged in the process.

2.5. Level of motivation. Participants identified their level of motivation as an important factor in the effectiveness of ImRs to initially change the ending.

"try to sort of throw yourself right into it an and go from there, you know, really if you're going to do it try and do, try and open your mind, an try an force yourself to think of so of err the different ending" (P2)

Additionally, motivation to believe in the rescript (focused code 2.2) was important for participants and moderated the effectiveness of ImRs. Participants discussed making a choice to believe in the rescript, despite knowing it was not reality, to alleviate distress.

"I want to believe it's, it's true, I want to convince myself like ... yea, I'm I'm, I'm trying" (P4)

"you want to believe it so much, because you don't want to, I mean for me personally I don't want to live, to live in that, in that room, in that past tense and you come out into the light, that's where I want to be, you know so, so I think if if you want to believe it, you will believe it (P6)

Motivation to practise the rescript outside of sessions (focused code 9.1) was also seen as an important factor in increasing the effectiveness of the technique.

"Yea err, bit hard [practising at home], but when you think you've got to do it then, I found I have to do this you got through, because I want to get better, to see myself as a different person" (P3)

2.6. Metacognitive insight (mechanism of action). Some participants discussed metacognition, "knowledge and cognition about cognitive phenomena" (Flavell, 1979, p.906). That is, a higher order cognitive process that monitors and makes adjustments to lower order cognitive processes. Participants discovered their ability to change a specific traumatic memory through rescripting, a capability they

had previously been unaware of. It is possible that a sense of being able to control memories to alleviate distress is powerful and could contribute to why ImRs produces change.

"I didn't even know that there was a system like this to change things and to change memory" (P3)

Experiencing control over specific memories then extended to other traumatic memories. In addition, participants discovered the ability to control their thought processes more generally and not tune in to distressing memories. One participant discussed developing the ability to take a new perspective of traumatic memories, and by doing so freed themselves from distressing thought processes by choosing to engage with more positive ones.

"If it comes [traumatic memories], I let, I let the train go and just stay on the platform because I know which train I want to jump on" (P7)

"I know there is another way of looking at things, it feels easier for me to connect quickly when this old thing that tends to bring me down" (P7)

One participant even suggested that being able to change memories increased a sense that change was possible in general life.

"before that [ImRs] I thought I was helpless and no one is helping me, I'm just a failure as a person, whatever I do, it would just all be negative, so after doing this I

thought ok there is life after that as well you can still change things, so that has changed" (P3)

2.7. Level of self-efficacy (mechanism of action). Closely linked to metacognitive insight, was self-efficacy. Participants needed to gain a metacognitive understanding that changing a memory and developing a new way of thinking was possible. Subsequently, if they achieved this, their levels of self-efficacy needed to be high, to increase ImRs effectiveness. Certain factors were linked to decreased self-efficacy in rescripting, such as needing the therapist's support (focused code 4.2) and so not developing rescripting skills (focused code 9.2).

"if I were to ever to have a situation again this is what I would do [rescript] so I started to understand it was more about ok that happened then but now this is what I could do (...) and I have the ability to do that (...) and right now I'm learning how to, to do that" (P5)

"when I remember something then as soon as I think I'm in danger then after that I just change it, change it to I'm free now, I had the power, I did this to them" (P3)

"It's my mind ... so if I allow my mind to go back to the original part of it, I mess things up, I wouldn't be able to know what I'm talking to you now, I go back to the old me and I start depressing myself with things that don't make sense, I close myself in that small building in the flat, I don't, I don't bathe, I don't like that ... so I've been given an opportunity to look at something different, to look at things differently from a different angle and it's working for me" (P7)

3. The importance of the therapeutic structure.

3.1. Timing of ImRs in the treatment process. Generally participants felt that it was effective to utilise ImRs in the latter stages of treatment, in line with their treatment experience. They discussed a feeling of readiness for ImRs following the use of other techniques and a sense of a natural progression moving through the treatment process.

"it was the right time that we started to do that [use ImRs], because there were the other techniques before, coping and what have you" (P1)

"we had done the reliving bits and all that then it just seemed like a natural progression to go into, you know, rescripting the image, to try and change the way my mind was thinking" (P2)

In line with this, most participants felt that, although distressing, it was important to complete reliving before rescripting. Different reasons were given for the importance of this, such as, wanting to remember the event before changing it, feeling the need to have a complete memory to create a different ending and using the traumatic memory as a guide for rescripting.

"I think for me having it at the the latter end of it was better (...) I couldn't of just gone in and gone oh yep that's the memory, let's change it" (P2)

"the relivings has just sort of opened out [the compacted trauma memory] and actually that's allowed you know me to retrieve a lot more useful information that's then fed in to the rescript" (P10)

One participant described attempting rescripting and subsequently not feeling as if it was the right time and needing more reliving sessions first, resulting in a sense of failure (linked to focused codes 2.7 and 9.5), emphasising the importance of undergoing ImRs at the right time in treatment. They also highlighted the importance of giving enough time to the technique itself, *"pacing" (P10)* it correctly.

"I think you can do it quickly but I don't necessarily think it would be as effective or have that kind of deep sort of resonance (...) it does feel important to allow the time for the emotional connection to happen with the rescripts actually rather than just sort of, a sort of a sticking plaster of a new narrative" (P10)

3.2. Timing of the rescript in the memory. Some participants would have liked the rescript to occur earlier in the memory, to experience support from the rescript throughout. Some participants felt the rescript occurring just before the worst moment was beneficial, so that it felt relevant. Some participants wanted the rescript to begin after the traumatic event. Two participants highlighted the need for contrast between experiencing the negative trauma and then later the positive rescript, to enhance the effects of the rescript.

"I probably would have liked him [the rescript] to come in a little bit earlier, before it all it did go wrong, you know if he was there just to walk me along, you know, walk in the room, or just being there" (P1)

"just before the worst bit really [rescripting occurred], yea, I think it was [helpful to rescript at that point], because if I had rescripted any earlier it wouldn't have felt as though it was relevant" (P2)

"*when you have danger and then you come onto the completely opposite side to, it's better to have different thing, to do it first [reliving the traumatic memory] and then [rescripting]" (P3)*

3.3. Viewing ImRs as part of a treatment package. Four participants discussed how they viewed ImRs as one facet in part of a larger treatment package, "*it's a good one to have in your bag of tricks to try" (P2).* It was felt that other therapeutic techniques were also necessary, rather than ImRs as a stand-alone technique, as different techniques enhanced the effectiveness of each other.

"I think that there has to be a point of talking it through in a logical way, cognitive kind of way, but I don't think you would ever really resolve anything with just that, you'd then need that other [ImRs]" (P5)

One participant viewed the concept of 'rescripting' as more than just ImRs, but rescripting with information also, referring to cognitive restructuring, *"the rescripting*

is other things that we've worked on as well" (P1). They felt that the imagery rescripting could then incorporate cognitive work to strengthen both techniques.

"by bringing <name of rescript> in and talking through <cognitive updates about the traumatic event> it is rewriting it and you know he isn't that beast of a man or what have you (P1)

One participant discussed the importance of looking beyond the traumatic memory in treatment, to the individual as a whole.

"It's not just oh let's fix that memory, it's like let's deal with that memory but let's also deal with the person, so that that person then feels confident to go out into the world and do things maybe a little bit differently and I wonder if that's really important because even when you deal with that memory, I don't believe that it's all oh fixed now, I think there has to still be in the future trigger points that could re-trigger symptoms even if they're less so, so if you deal with the person they're then able to deal with those trigger points" (P5)

"there's all sorts of things that you as a person bring to that and take away from it and so you can't just be about rescripting" (P5)

4. The importance of the therapist.

4.1. Trust in the therapist. As with other therapeutic techniques, the therapeutic relationship, establishing trust and creating a safe environment were discussed as important for the effectiveness of ImRs. It was suggested that

establishing trust is especially important before working with traumatic memories, *"you need to build up trust with the therapist before you jump straight in to kind of the more memory focused things" (P10)*. Particularly, with a technique such as ImRs, which may initially make less 'sense'.

"I also really trusted <therapist> so I think that's a huge part of the whole process to work with someone that you really feel you can trust (...) I don't think you could do it with just anybody, you'd have to build up that trust with somebody" (P5)

"I had to trust her and accept and appreciate what she is doing but if someone is, doesn't want to open up and say "ok I'm getting treatment, this is part of the treatment", it might not make sense" (P7)

4.2. Level of support and guidance with rescripting. Participants varied in the amount of support and guidance they required with the ImRs technique. Generally participants saw ImRs as a joint endeavour with the therapist, with one participant describing the process largely with the *"we" (P4)* pronoun. Participants relied on the therapist's support to decide when in the treatment process to complete ImRs and on which moments to rescript. The feeling of safety created by the therapist and the formality of the therapeutic environment facilitated ImRs. One participant suggested that increased support with deciding on the rescript is particularly important for childhood memories.

"I suppose where the traumas are more early trauma, and the sort of meanings are going to and the sort of sense when you're going through the reliving is quite a young

sense because of course you're doing it from that young point of view, I think in those cases it may need more sort of guidance and support" (P10).

However, some participants needed the therapist's support to such an extent they did not feel confident to rehearse the rescript or consider further rescripts outside of therapeutic sessions (linked to focused code 2.7 and theoretical code 9).

"It felt errm positive after I had finished it but I I felt very, I felt very difficult, very difficult to keep going back to it on my own" (P2)

"I couldn't use the <rescript> or think about myself alone to do something like that at home" (P4)

4.3. Using the therapist's presence in the rescript. Two participants explicitly mentioned having the therapist present in the rescript and found this to be beneficial, describing feeling less alone and more supported. One participant found it helpful for the therapist to model behaviour in the rescript, such as being assertive and standing up for them, which enabled them to begin to do this for themselves. Also linked with this was finding it helpful for the therapist to lead the rescript and make decisions regarding what to change, for example, speaking to the perpetrators and taking the individual away from the traumatic scene. One of these participants specifically discussed that they were rescripting a childhood memory, for which the literature suggests the benefits of utilising the therapist as a supportive presence in the rescript (Arntz, 2011), *"as a kid you can't stand up to adults but if there is an adult there helping you [you can]" (P6)*

"I never had anyone there, and to have someone stand up for you sort of and say what he said um and address things that needed addressing you know and to take me away from the situation (...) to have someone that thinks that much of you to take you out of that situation straight off is er, is er, is, is quite you know something special I suppose" (P6)

"I couldn't say the things that he could say so he very much modelled and then kind of scaffolded me so you know through practice to be able to do that myself" (P5)

5. Creating an effective rescript.

5.1. Level of agency in choosing the rescript. Generally, most participants wanted to choose the change occurring in the rescript, contrasting to the therapist being in the rescript and making changes (focused code 4.3), perhaps influenced by whether the trauma occurred in childhood or adulthood. One participant advised that individuals should be given the chance to choose, *"do the ending however they want, (...) let them decide how they want to" (P3).*

Interestingly, the same participant who had utilised the therapist in the rescript initially also said that the rescript that was the most powerful and strongly associated with the traumatic memory was the one they had autonomously decided upon; it felt like it fitted and solved a problem.

"you know you get that sort of, that moment of when you get an idea that comes, not just to do with this, just in life, the way the brain works, that if you have that kind of eureka moment or you have an idea to solve a problem and that and you get that

sense of ahh! I think if, if the rescripting is associated with that kind of, where it's really come from you and your own creativity or something that really matters to you then I think that somehow that then gets really strongly associated with that memory" (P5).

Another participant suggested that it was important to have agency in choosing the rescript as the therapist was not there at the time of the traumatic event, so only they could choose exactly how they would have liked the event to have been. In line with this, multiple participants discussed the importance of choosing rescripts with personal meaning to them. One participant discussed the rescript needing *"emotional logic" (P10)*, something it is likely only they could understand.

"she wasn't there when it happened so she wouldn't understand ... the smell ... the flies (long pause) so it was, I went in a certain kind of ... different world and brought what I thought ... was cleansing and and (long pause) and true to my inner soul how I would have liked it to be" (P7)

5.2. Optimal vividness. Participants generally experienced the rescript as vivid, which was helpful, "*the more vivid the better I would say" (P9)*. Participants described using multiple senses to create a vivid rescript, such as: touch, *"I could almost feel his fur" (P1)*; sight, *"you know what colour the sky is" (P6)*; smell; and taste, *"try to also imagine the smell of the food and texture of it and the different tastes" (P9)*. It was suggested that a vivid rescript aided effectiveness through creating new and vivid emotions and feelings, such as safety. One participant

suggested that over time the rescript became more vivid than the original traumatic memory.

"that made it much more helpful I suppose, to use more than one sense" (P9)

"at some point the rescript becomes more vivid than the, I mean the sensations of the rescript become more um vivid than the one of the original, of course I can remember it but it doesn't actually cause the same sensations anymore" (P9)

One participant suggested that the more vivid the rescript, the more cognitive resources it utilised, reducing the impact of the traumatic memory.

"I think if you use more that one sense, it takes up more of (…) your brain power or something (laughs) you know what I mean and you get more and more into it and it takes you furth, more away from this original … um what you want to get away from" (P9)

However one participant did not find the rescript to be particularly vivid, but still found it to be effective.

5.3. Optimal perspective. Generally participants used both field and observer perspectives in the rescript, but found field perspective to be more beneficial, "*it was both … but the one I like most, the one when I am participating myself" (P7)*. It was suggested that it was more difficult to create a rescript from field perspective, and

perhaps a progression was needed from observer to field. One participant wanted to observe traumatic events before progressing and making changes.

"I think I tried to put myself in the sort of first person part of it but I couldn't really, I had to be looking down" (P2)

"it was good to see what was going on and observe the bad stuff and then realise the mistakes and progress from there so (...) I think they overlap but they overlap very well so first of all you're observing what's going on and then obviously you become part of the setting" (P6)

Participants had different reasons for preferring to view the rescript in field perspective. One participant found it more intense. Two participants suggested it resulted in a feeling of increased control in the rescript and one also described needing to be the one to make the changes in field perspective to alleviate guilt they felt from actions taken at the time of the traumatic event. Another participant felt field perspective enabled them to utilise all their senses in the rescript.

" to do the change, so that I change whatever that is happening with being me and the action that is taking place (...) because I am the one suffering (long pause) and I am the one who did what happened" (P7)

"I think the field perspective is really helpful (...) it ties into the physiological, the sensory, and to the emotional in a way that that sort of observer perspective doesn't really" (P10)

6. Felt sense change mechanism. All participants, except for one for whom ImRs had been less successful, experienced a change in felt sense, which often addressed emotional needs that were not met at the time of the traumatic event. One participant summarised this in suggesting ImRs worked by *"bringing about that kind of emotional shift within the memories" (P10).*

6.1. Changing emotions. Participants found key emotional states changed due to the rescript, including decreasing fear, releasing anger and alleviating guilt. One participant also experienced an increase in sadness that the rescript and what it represented had not been available at the time of the trauma. Another participant accessed emotions such as grief and forgiveness through rescripting.

"if you can find a way of repressing that heavy yoke on your shoulder [guilt]…I think it would the best thing that could happen to an individual" (P7)

"I mean it's a bit like, you know when you're very very angry and you punch a punching bag or something yea, I mean it's not physical but it's a, you know, mental way, it's a sort of an equivalent, it helps you get rid of that aggression (laughs) and even though you don't do anything but the sensation is … very similar" (P9)

"it was emotional, I, just er, cried but it was a mixture of relief that it is…ended and sadness that she [the rescript] was not there before" (P8)

One participant suggested that if their focus was on the new images, they would replace the negative emotions of the original memory, *"for example this anger or for*

example this void where you feel dead and it [the rescript] sort of fills that space because you can't have both at the same time" (P9).

6.2. Changing feeling states. Participants also described widely varied experiences of feeling states changing. For example, participants felt more protected, safer, less vulnerable and less alone in the rescript. Participants also described an increase in comfort, compassion and sympathy. A sense of being liberated, free and lifted was discussed. Participants also felt an increase in power, control and strength. One participant found it important to incorporate humour into the rescripts. One participant also described a decreasing in feeling *"dead" (P9)*, with this being one of the most difficult felt senses to change.

"I almost feel that it wasn't you know, they weren't going to do anything because he was there and he would step in if what have you, so that's a complete going from completely vulnerable to I've got you know him there" (P1)

"I was desperate for compassion and I couldn't see it in anyone, (…) there was no sympathy from anybody even though I was in that state, I couldn't walk, I couldn't talk, I felt like oh everyone hate me and um but … now, so that was very important to find someone in those situations, even though I rescripted it, find someone who is with me, I am not alone" (P8)

"getting the power to our side, like err getting the benefits onto our side like erm the strength you have after, how they had and how I have now" (P3)

However, one participant suggested that it was difficult to imagine a compassionate image with no personal experiences of compassion to draw upon.

"maybe it was reason why I couldn't find that image um ... because er I couldn't remember when um, being cared and (she starts to cry) and er ... I just couldn't remember any people or toys I have got, comfort me or make me happy" (P8)

Interestingly, a change in cognitions was only occasionally mentioned and was usually linked to a change in felt sense. For example, two participants discussed a slight decrease in blaming themselves and then linked this to felt sense change, such as not feeling at fault and not feeling so pathetic.

"I think that was one of the things that was holding me, sort of imprisoning me to the past is that I kind of blamed myself (...) so I think, I feel a lot, I sort of ... more ... I've resolved a lot of that and don't feel that um ... everything's my fault" (P5)

6.3. Completing behavioural urges. Participants also discussed completing behavioural action urges that were not possible at the time of the traumatic event. For example, gaining revenge and punishing the perpetrators, destroying items that had caused the most distress, completing appropriate cultural practices after someone had died and escaping the traumatic scene. Meeting these needs appeared to also change emotions and contribute to alleviating distress.

"it makes sense, because in my culture, when someone dies, he should be buried" (P7)

"I freed myself, put them into a corner, showed them the gun and I was freeing everyone who was facing the same thing as me and I was running to save my life" (P3)

6.4. Generalising feeling and behaviour change to general life. Five participants discussed that the feeling change experienced in the rescript generalised to life more broadly, for example, a decrease in anger, fear and guilt and an increase in compassion towards themselves.

"connected to that memory or to things related somehow to it [anger has decreased], maybe not just to this particular memory because often there are lots of other things that are somehow related to it" (P9)

"I needed something to help me understand…how I would live the rest of my life, the little time that I'm left with, I can't carry on living with that heavy burden [of guilt] when there is another way of looking at things" (P9)

"I think it has beyond that just more into my life really, I mean I'm feeling much more generally compassionate towards myself than I was when I first started" (P10)

Furthermore, participants found the rescript changed their behaviour more generally, such as, being able to be alone more and asking family for help and support. When asked about the feeling of being alone now occurring in life one participant said *"I can deal with it a lot easier, um quite a few times now I've found myself er well I walk*

me dog and that, you know I choose to be on me own because I choose to think, whereas before I'd, I'd have to have a distraction" (P6).

"it's changed me outlook, I know, I know what I'm capable of, I know, you know, how strong a person I am or can be (...) I know what I've done in the past and (...) it just seems to be I can realise when I'm making them mistakes so you can move forward" (P6)

7. Memory change mechanism. Participants experienced change to memory representations during an ImRs session in different ways. Firstly, feeling as if the original memory was permanently changed, and secondly, experiencing a new memory being created. Change to the original memory could be conceptualised as the trauma memory feeling as if it had been rewritten during an ImRs session. Inevitably, memory change during an ImRs session was closely linked to the accessibility of the memory following a session (theoretical code 8).

7.1. Changing the original traumatic memory. Two participants described an experience of the original traumatic memory feeling as if it was *"rewritten" (P5)* or permanently changed, *"it complete changed the ending of that memory" (P5)*. These participants found that the rescript was automatically accessed following a rescripting session (focused code 8.1).

"it almost did feel like I had rewritten that bit like I had actually changed it (...) I've carried that around with me for so long and it just felt like it just, that part of it, just left" (P5)

"you could probably say it's replaced it but not in a deluded kind of way" (P5)

"rewriting, that's what I think she will be there even though it didn't happen but in my memory she will exist in that moment" (P8)

7.2. Creating an alternative better memory. Alternatively, the majority of participants discussed their sense of a new memory being created during ImRs, with two memories then existing: the original traumatic memory (although this often felt less distressing) and the new more positive rescript. The effectiveness of ImRs then depended on the accessibility of the rescript, which if accessed would alleviate distress (theoretical code 8).

"Two memories [exist now], one with the original ending and one with the imagined" (P3)

"he [therapist] could give me a new memory, which appealed, to the old one so I'd rather have a new one or try and think of a new one" (P6)

"I was stepping on the old one, I was stepping on it creating a new one" (P7)

7.3. A change point in the memory. Two participants described an experience of a change in the memory between the original traumatic memory and the rescript. One participant described this as a *"break"* and a *"cut off" (P9)* and suggested this sensation was similar to the *"higgledy-piggledy" (P9)* nature of flashbacks where at

the most distressing and emotional moments breaks in the memory occur. Another participant experienced the rescript like *"flicking through channels" (P10).*

"all of a sudden like a cut-off and then I can sort of choose to do it and sometimes it comes out automatically more, but sometimes it's like, it feels like there's a little break but it might just go on" (P9)

"something in your brain notices there is a break somewhere, there's something that doesn't flow from, yea flow on" (P9)

"there was a really interesting almost like a kind of flicking through channels or something, you know there was kind of a momentary thing of the original memory there and then very quickly it kind of came in with the rescript" (P10)

Post ImRs Session

8. Long-term accessibility of the rescript. As previously mentioned, the accessibility of the rescript was closely linked to the memory change that had occurred during the session (theoretical code 7). It was more common for participants to feel they needed to intentionally access the rescript, however, it did also occur automatically for some. Participants found that the same rescript was sometimes automatically accessed and sometimes intentionally accessed. Furthermore, the same participants also experienced both automatic and intentional accessing of the rescript, dependant on the memory.

"those two are together [the trauma memory and the rescript], it is not just oh I'm going to be positive and think of this other, it's like oh those two just go together now (...) or some of them I have to kind of actively remember the rescript (...) there's just some that are just much stronger for whatever reason" (P5).

8.1. Automatically accessing the rescript. Six participants described the rescript being automatically accessed, without having to intentionally retrieve it, and that this could occur when they were feeling particularly fearful or stuck. However, as mentioned, some participants for whom the rescripts came to mind automatically described also having to intentionally access the rescript at other times.

"When I'm [by] myself like um the power [rescript] comes sometimes, it's when I'm really stuck like then it comes itself you know because I had it like many times and then it's something like maybe it's coming to you without you knowing" (P4)

"rather than the intrusion from the memory coming back in that situation, what I found was that the rescript was coming in" (P10)

"Either can happen, they either come automatically or sometimes there's sort of a moment, you know, when there's sort of a moment and you manage to do that" (P9)

However, the two participants who described an experience of the rescript feeling like it had changed elements of the original traumatic memory (focused code 7.1) found that the rescript was consistently automatically accessed. One participant in particular expressed that certain rescripts were always there when the traumatic memory was

retrieved, as they had a "*better association" (P5)*. This participant clarified that although the facts of the memory remained, the rescripted ending was always present.

"the most powerful one is that one I described to you where I just had that real revelation, I now hold that, like that is now really strongly associated with that memory so whenever I think, if that was to pop into my head I would always think of that ending" (P5)

Importantly, it should be noted that when a rescript occurred automatically it was not possible to clearly ascertain what had occurred to the underlying memory representations during the ImRs session. For example, it is possible that the original traumatic memory had changed or that a new memory had been created that was always more accessible, linked with a better association.

8.2. Intentionally accessing the rescript. Nearly all participants discussed having to intentionally access the rescript when the traumatic memory was triggered, *"some of them I have to kind of actively remember the rescript" (P5).*

"I think about the traumatic ones first and then I choose to bring in the other memory, the rescripted one where (…) it's like a safety net" (P6)

"it's kind of like it's swimming around in my head and if I can grab it, it, then it's better that I have a better ending" (P2)

Participants discussed tuning in to and focusing on the new rescript, with the informed knowledge that not doing this, would be detrimental for their well-being, *"it's almost like a safe haven and I know that if I can get to that that the rest of it will stop" (P2).* One participant described their thought processes behind choosing the rescript, over the traumatic memory, to feel less distressed.

"you know what you are going to do if you touch a burning plate [the traumatic memory] so that's ok don't touch the burning, you know what it is, so why do you have to force your hand to touch the plate" (P7)

Some participants suggested that the original traumatic memory is still present, but now they have an option of accessing something less distressing, *"your bad memories never go, you can never change them, but at the same time you can think of a newer one" (P6).*

Participants also discussed that in addition to individual factors that affect accessing the rescript (e.g., mood, motivation, setting) the rescript itself had to be available, to be able to be accessed. The participants that discussed this generally found whether the rescript was available could be outside their control.

"It can vary really because as I say sometimes he will go away and I won't be able to get him [the rescript]" (P1)

"It has to arrive, I can't force it (…) it just there, it just appears in my mind" (P2)

8.3. Change in accessibility and strength of the rescript over time. Overall participants found that the rescripts became more accessible over time. Even participants who had recently completed an ImRs session described a change over a limited time. Rehearsing the rescript was found to increase accessibility (focused code 9.1).

"in the beginning I think I would, I would bring her [the rescript] in there but now she's like, she's there and I just need to realise that she's there, just yea … that's what I feel like, from now she will be there, like I already put her into that situation with me" (P8)

"I mean more recently it seems, I think it has happened with all of them [accessed more automatically], it's started to happen with all of them. In the beginning when I started using it, all I can tell you is that it was just happening less" (P9)

Linked to this, participants described the power and impact of the rescript increasing over time, which they could foresee continuing.

"It's something new, it hasn't, it hasn't (long pause) it hasn't matured enough to overshadow the whole road but I am enjoying it so I want it, I want it to carry on like that" (P7)

"I think more recently, the rescript has felt much stronger (…) I think that shifts over time" (P10)

9. Enhancing on-going use of ImRs.

9.1. Rehearsing the rescript. Participants discussed rehearsing the rescript already created in sessions, which appeared to be beneficial for the effectiveness of ImRs. Varied reasons were given for the importance of rehearsal, such as repeating the rescript increasing its strength, believability, vividness, the ease of access (theoretical code 8) and its impact. One participant described having the mind-set that practice is essential and motivation to practise was important to alleviate distress (focused code 2.5).

"you'd need to just practise it and practise it, in order to really sort of believe that's what's happened" (P1)

"the more often, the more you do it, at least on average, I mean it doesn't always work the same, the more effective it becomes" (P9)

"I think about it everyday so the memory becomes, becomes second nature" (P6)

One participant, who had completed ImRs the longest ago, shared that it was very difficult to rehearse the rescript outside of sessions and so now could not remember it clearly. Another participant described the difficulty in rehearsing as it felt different to do so at home, than in the supported therapeutic environment. Rehearsing the rescript could be linked to the amount of support and guidance an individual needed from the therapist in completing the technique (focused code 4.2)

"*I would try [to rehearse the rescript], but it was very difficult (…) I did try though, I tried really hard to, you know, go a different way and sometimes I did and sometimes I didn't" (P2)*

9.2. Developing rescripting skills. A slightly different concept discussed was participants developing the skills to rescript autonomously. That is, rather than just rehearsing the same rescript already created, some participants began to change rescripted memories further and/or rescript new memories themselves, outside of treatment sessions. One participant shared that it was important to do this because new threats/needs could arise in an already rescripted memory at a later time. One participant suggested that it took time to develop the skills to do this autonomously. There was a wide variation in developing skills, from participants who felt unable to do this to those who repeatedly did so, *"all the time, now I've got it [the skill]" (P7).*

"having done it over and over again and all this, it does make it easier, you have to sort of train yourself somehow to do it" (P9)

"I would sometimes change what I came up with in the session and like modify it so it helps to then reinforce it as well as a memory" (P5)

"you start to make up something about some other ones you know, you haven't touched on yet, yea, that's what I did as well, I start to sometimes use, make different ones up when I had flashbacks about other incidents and things like that (…) this took a long time until I started to do this" (P9)

9.3. Using rescripting aids. Seven of the 10 participants utilised aids, which increased rescripting effectiveness, for example drawings, images on mobile phones and physical objects. These were created both in session and at home and were used to help create rescripts, to cue visualisation of the rescripts, and one participant found them to be 'grounding'. These were found to be beneficial in continuing to utilise the rescripts long-term. One participant discussed how it was helpful to create pictures of the rescript for homework.

"I drew him, so he's quite real to me and would have him sort of dotted about the house or wherever just to feel a bit safer" (P1)

"Visualising, because it was in the head and then I was putting it in paper so see what was happening" (P7)

9.4. Using the rescripted image more broadly. Interestingly, three participants discussed using the rescripted image more generally, for example, as a separate compassionate image that could be brought into therapy sessions, other areas of life, and even be sent to comfort others.

"I've brought him in to my thoughts about when there's been other stuff going on in life ... erm ... an example I can give you is that recently my erm <individual> has been diagnosed with <…> so I sent him to him [the rescript] in my head, just to give him a bit of a comfort…so in that sense I'm using him for every day things as well (P1)

Another participant utilised the rescripted image, as separate from the memory as someone to trust, talk to, and understand her.

"It's like I have a new um friend who I can, I used to talk to myself a lot but now I'm not like talking just to myself, I can talk to her and I feel better about it (...) she's, she's like single like me and she has no-one and she's genuinely interested in my life and what's going on with me (P8)

Another participant had shared their rescripted image with friends and family to enable them to utilise it as a tool to lift their mood.

"I've told everybody like my family about it, like even on the phone, (...) and everybody's talking about <rescript> (...) they would just start talking, using these characters and talking about them as if they were alive and that also sort of helped me to calm down, outside of that rescripting thing (P9)

However, one participant experienced using the rescript as a compassionate image resulted in feeling the need to protect and defend the image within traumatic memories. This resulted in decreased effectiveness of that image in certain memories.

"there were things that I didn't want him to see so I couldn't bring him into my memory (...) because it was too awful for him to see" (P1)

9.5. Attitude towards the ImRs technique post ImRs. Participants' attitudes to rescripting following rescripting a memory were largely positive, for example

viewing the rescript as a lifeline and treasuring the rescripts. Following the ImRs process one participant talked about choosing to think of the rescript to protect the positive gains from treatment.

"you feel like when you're thrown in the water and you just want to come out and if you had, there was something you try, stick on it, you just try" (P4)

"I go to a different plane and I treasure them (long pause) I treasure them" (P7)

"I have had treatment … and I don't want to destroy it (…) I can't keep on reliving those incidences because I have a life to lead now" (P7)

Importantly for on-going rescripting sessions, two participants described positive attitudes increasing when early rescripts were successful. Conversely, one participant suggested that when rescripting did not work the first time this triggered feelings of failure for them.

"So that was very powerful [rescripting success] and I think so then sort of on the back of that experience I then was able to trust the process of what we were doing" (P5)

"having had the experience of doing the rescripting with the first memory, I knew and felt more confident actually that the approach would work in the second" (P10)

A Model of the Effectiveness Factors and Mechanisms of Action of ImRs

Overview. This study aimed to explore the potential mechanisms of action and factors that moderated the effectiveness of the ImRs technique and generate a theoretical model to increase understanding. The following model, based on participants' accounts, is a diagrammatic representation of concepts that could be considered potential mechanisms of action, represented by cogs (theoretical codes 6, 7 and focused codes 2.6 and 2.7) and effectiveness factors, represented by squares (theoretical codes 1, 2 [focused codes 2.1 - 2.5] 3, 4, 5, 8, 9). Arrows demonstrate the direction of influence. The effectiveness factors are divided into temporal order of pre, during and post an ImRs session. A simplified model is presented in the results (Figure 2) and a more detailed model in the Appendices (Appendix 14).

Mechanisms of action. Potential mechanisms of action, represented by cogs, included a change in felt sense (theoretical code 6) and a change in memory representations (theoretical code 7) as the two main mechanisms of action. Metacognitive insight (focused code 2.6) and self-efficacy (focused code 2.7) were also proposed as potential mechanisms of action, although less evidence for these emerged from the data.

Effectiveness factors. Factors that moderated the effectiveness of ImRs, represented by squares, began with those relevant before the rescripting session commences. These included, 'factors preceding ImRs' (theoretical code 1), including the nature of the trauma memory (focused code 1.1), attitudes towards treatment and change (focused code 1.2) and attitudes towards the ImRs technique specifically (focused code 1.3).

Factors that moderated the effectiveness of ImRs at the time of the rescripting session included 'individual differences' (theoretical code 2), such as imagery ability (focused code 2.1), ability to believe in the rescript (focused code 2.2), an individual's mood (focused code 2.3), their level of dissociation (focused code 2.4) and their level of motivation (focused code 2.5). Further effectiveness moderators at this time were linked to the structure of therapy and where ImRs fell within that, 'the importance of the therapeutic structure' (theoretical code 3). This included the timing of ImRs within the treatment process (focused code 3.1), when the rescript began within the original traumatic memory (focused code 3.2) and combining ImRs with other therapeutic techniques (focused code 3.3). Factors related to the therapist also moderated the effectiveness of ImRs, 'the importance of the therapist' (theoretical code 4). This included the level of trust participants had in them at the time of the rescripting session (focused code 4.1), the level of support and guidance received during the ImRs sessions (focused code 4.2) and utilising the therapist's presence in the rescript (focused code 4.3). Finally, aspects of the rescript itself were found to moderate effectiveness, 'creating an effective rescript' (theoretical code 5). This included levels of agency in choosing the rescript (focused code 5.1), optimal vividness (focused code 5.2) and optimal perspective (focused code 5.3).

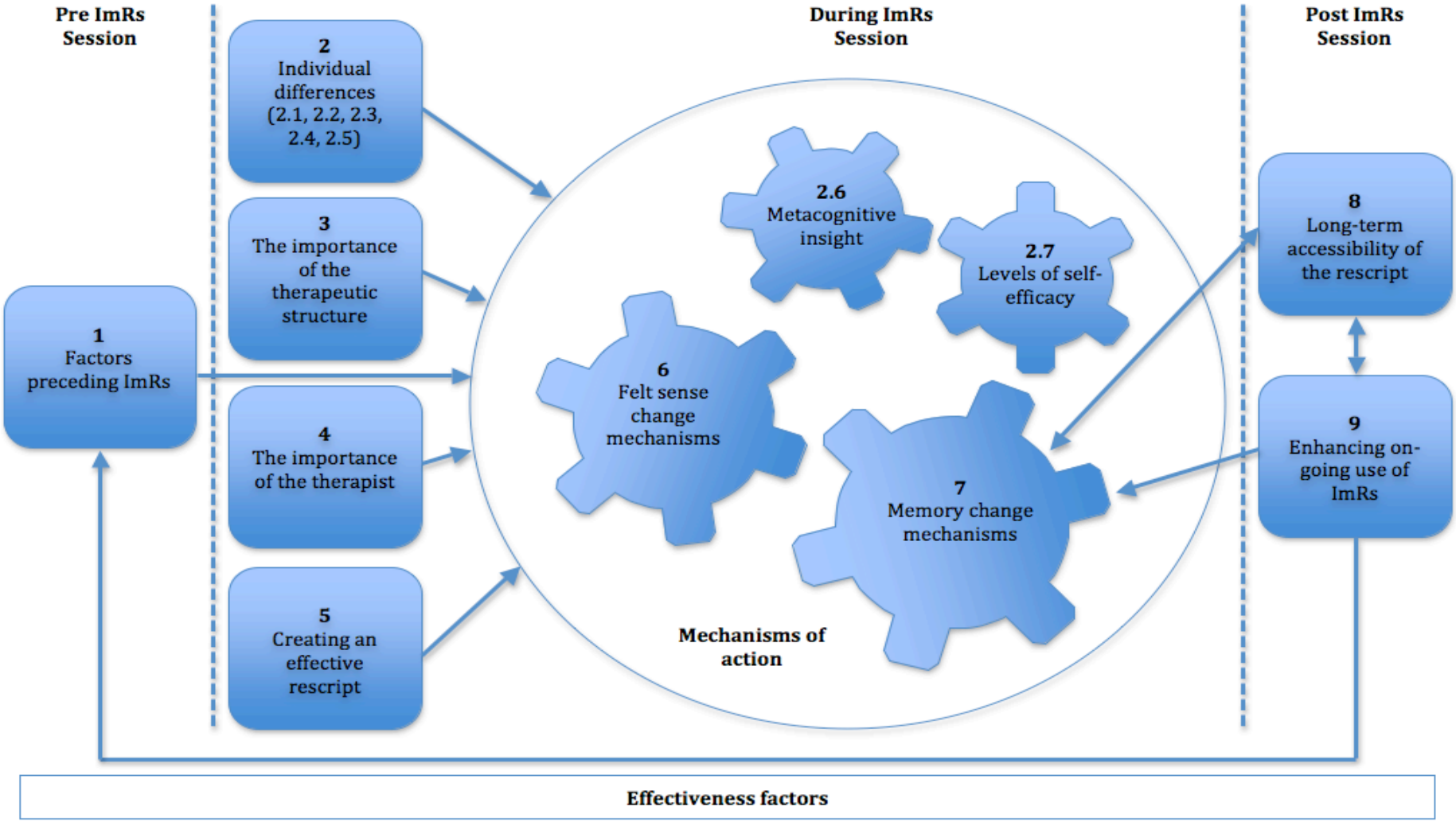
Factors that moderated the effectiveness of ImRs after a rescripting session included 'long-term accessibility of the rescript' (theoretical code 8), which included automatically accessing the rescript (focused code 8.1), intentionally accessing the rescript (focused code 8.2) and a change in accessibility and strength of the rescript over time (focused code 8.3). This theoretical code was a result of memory change during rescripting which influenced later accessibility. However, this theoretical code

also had a bidirectional relationship with memory change, as accessing the rescript following creation, through rehearsal (focused code 9.1), promoted on-going memory change. The arrow extending directly to memory change represents that participants linked this theoretical code to this mechanism of action specifically. Participants suggested that 'enhancing on-going use of rescripting' (theoretical code 9), including rehearsing the rescript (focused code 9.1), developing skills (focused code 9.2) and using aids (focused code 9.3), increased the effectiveness of ImRs over time. Again, the arrow extending directly to memory change represents that participants linked this theoretical code to this mechanism of action specifically. Some participants found that utilising the rescripted image more broadly, for example outside of the traumatic memory, was beneficial and alleviated distress (focused code 9.4).

Importantly, a feedback loop was suggested which related to future rescripts, rather than the rescript just created. For example if participants developed rescripting skills (focused code 9.2), this increased their self-efficacy with the technique (focused code 2.7), and increased the likelihood of them rescripting again in the future, due to having positive attitudes towards ImRs (focused code 1.3). Similarly, feeling positive about the rescripts generated and experiencing less distress because of them (focused code 9.5) increased the effectiveness of the next rescript, again by improving attitudes before the next rescripting session (focused code 1.3). This feedback loop demonstrated that ImRs should be considered an iterative process, with the effectiveness of one rescript affecting the next, and so on. It is also highly likely that the effectiveness of one rescript will link to theoretical codes present at the time of rescripting directly, such as 'individual differences' (theoretical code 2) and 'creating

an effective rescript' (theoretical code 5) (see Appendix 14). However it was felt there were insufficient data generated regarding this to include within the model.

Figure 2.
A model demonstrating the potential mechanisms of action and effectiveness factors of ImRs.



Chapter 4: Discussion

Whilst research demonstrating the efficacy of ImRs for PTSD is accumulating (Arntz, 2012), there is still a lack of research regarding its mechanisms of action or factors that moderate its effectiveness. The aims of this study, therefore, were to explore individuals' experiences of ImRs in the treatment of PTSD, to determine factors that influenced its effectiveness, and consider potential mechanisms of action, relative to what is suggested by existing theory. A model is proposed (Figure 2) aiming to increase the theoretical understanding of ImRs, and so in turn, increase clinical effectiveness.

Overview of Findings

Nine theoretical codes were generated which included both potential mechanisms of action and factors that moderated the effectiveness of ImRs. The theoretical codes suggested as potential mechanisms of action were 'memory change mechanisms' (theoretical code 7), 'felt sense change mechanisms' (theoretical code 6) and the focused codes of 'metacognitive insight' (focused code 2.6) and 'level of self-efficacy' (focused code 2.7). Effectiveness factors were grouped into an approximate temporal order, including factors present before an ImRs session, at the point of an ImRs session, and after an ImRs session, although it is acknowledged that there will inevitably be overlap between these stages. These factors included: 'factors preceding ImRs' (theoretical code 1), 'individual differences' (focused codes 2.1 - 2.5), 'the importance of therapeutic structure' (theoretical code 3), 'the importance of the therapist' (theoretical code 4), 'creating an effective rescript' (theoretical code 5), 'long-term accessibility of the rescript' (theoretical code 8) and 'enhancing on-going

use of ImRs' (theoretical code 9). It should be considered that the concept of effectiveness factors and mechanisms of action were part of the study rationale, not participants' suggestions, therefore determining which factors came under which category was subject to the researcher's interpretation of the data.

Research Questions

What are the potential fundamental mechanisms of action of ImRs?

Memory change mechanism (theoretical code 7). All participants reported experiencing memory change of some form due to ImRs. This was considered an underlying mechanism of action, however was closely linked to the later accessibility of the memory representation (theoretical code 8). The majority of participants felt that during ImRs a new, less distressing memory had been created, resulting in the sense of two memories existing, the original traumatic memory and the rescripted memory (focused code 7.2). This is in line with the dual representation theory of memory (Brewin et al., 1996; Brewin et al., 2010). Brewin et al. (2010) proposed that during ImRs, the C-rep of the intrusive memory/image is retrieved, the content of the associated S-reps accessed, and then contextualised with the C-rep. This process creates a new, elaborated C-rep, which includes both negative, and positive and novel information. If this is successful, when this new C-rep is retrieved positive emotions and sensations will be retrieved from S-memory, alleviating distress. Participants' experiences of accessibility of the rescript were particularly relevant in relation to the competition between two memory representations.

Alternatively, two participants felt that the original traumatic memory itself had changed due to ImRs, rather than a new, alternative memory created (focused code

7.1). For example, one participant discussed the trauma memory being *"rewritten" (P5)* or permanently changed. If change to the original memory representation had occurred, this is in line with theories suggesting ImRs works through 'UCS-revaluation', that is, a change in meaning of the original US, the traumatic event (Arntz, 2011; Arntz, 2012; Arntz & Weertman, 1999). Arntz (2014) suggested that if the meaning has changed, a reminder would result in the new memory representation being accessed, along with decreased distress, as was the case with some participants. This fits with Lane et al.'s (2015) proposal that therapeutic change occurs by "activating old memories and their associated emotions, and introducing new emotional experiences in therapy enabling new emotional elements to be incorporated into that memory trace via reconsolidation" (p.3). Ecker (2015) highlighted that for reconsolidation to occur, not only does the memory representation need to be activated, but a mismatch of prediction error experience must also exist. It is possible that a rescript could act as that mismatch. However, a debate regarding reconsolidation is on-going, as recent research with humans demonstrated that after retrieving a memory, reconsolidation of new learning did not occur (Hardwicke, Tagi, & Shanks, 2016). It is clear that further research is needed, as if ImRs works through reconsolidation, this could result in change that endures multiple contexts, possibly decreasing the chance of relapse.

However, it is not straightforward to determine the underlying change to memory representations. For example, it should be considered that MTT (Nadel & Moscovitch, 1997; Moscovitch & Nadel, 1999) would suggest that even if the original traumatic memory has been changed, many other traces of this memory remain. While Lane et al. (2015) suggested that it is conceivable that following

reconsolidation the original memory and associated emotions could no longer be retrievable, Arntz (2012) proposed that the facts of the original event would remain. This raises the question of whether this could feel like two memories to participants.

Felt sense change mechanism (theoretical code 6). Nearly all participants experienced a change to their felt sense through ImRs. This linked to the ideas of an interacting cognitive subsystems model (Teasdale, 1997a; 1997b; Teasdale & Barnard, 1993), which proposes two levels of meaning of information: 1) specific propositional and 2) generic implicational. The theory proposes that content at the generic implicational level does not map onto language and includes themes related to an individual's world, body, and mind, summarised as 'felt sense'. Therefore, intellectual (specific propositional) and emotional (generic implicational) beliefs need different types of experience to promote change (Bennett-Levy, 2003). Indeed, Teasdale and Barnard (1993) suggested that using guided imagery after trauma is in line with changing implicational codes. Others have also discussed this idea of a felt sense, with Gendlin (1981) describing it as an internal bodily awareness or sense of meaning. Interestingly, participants in this study generally did not experience ImRs to have changed their cognitions, rather their emotions. It has previously been suggested that ImRs could be more effective than other CBT approaches in addressing beliefs resistant to rational reasoning, rather those experienced on a feeling level (Cooper et al., 2007).

Participants experienced changes to key emotions due to ImRs (focused code 6.1). One participant described releasing their anger through the rescript, which is in line with the suggestion that rescripting satisfies rather than suppresses anger (Arntz,

2014). Another participant felt *"liberated" (P7)* from a long-standing sense of guilt. This finding fits with research demonstrating ImRs to result in better outcomes for emotions such as anger, hostility and guilt, than IE alone (Arntz et al., 2007). Participants also experienced sadness and grief, for example, due to the knowledge that what the rescript represents was absent during the trauma. Arntz (2014) suggested that following ImRs a mourning process is natural and healthy and should be validated and supported by the therapist. These varied changes to participants emotions make sense when considering research demonstrating the strong effect that imagery has on emotions (Holmes et al., 2008; Holmes & Mathews, 2010).

Participants also experienced their feeling states changing, in varying ways (focused code 6.2). One example was participants experiencing an increased feeling of comfort and compassion through the rescripts. Creating compassionate rescripts has been demonstrated to be beneficial, in treatment for depression (Wheatley et al., 2007; Wheatley & Hackmann, 2011) and with childhood memories (Wild et al., 2008). It is likely that incorporating compassion into rescripts in PTSD treatment more generally will be beneficial, as PTSD can be characterised by critical thoughts and an inability to self-soothe (Lee, 2005). Research has demonstrated compassion work to be beneficial when treating PTSD, particularly with emotions such as shame (Lee, 2005; 2009). However, it has been suggested that not having compassionate examples to draw on can cause difficulties when creating a compassionate image (Gilbert & Procter, 2006). This was particularly relevant for one participant who could not recall being cared for as a child and therefore found creating a compassionate rescript difficult. This should be closely considered during ImRs sessions.

Participants also completed behavioural urges during rescripting that were not possible at the time of the trauma (focused code 6.3). This included gaining revenge and punishing perpetrators, destroying items that had caused the most distress, completing appropriate cultural practices after someone had died, and escaping the traumatic scene. Completing these behavioural urges appeared to alleviate emotional distress. Arntz (2014) suggested that it could be healing to express actions through imagery that were prohibited at the time of the trauma to ensure survival (Edwards, 2007). Arntz (2011) also proposed that ImRs is not about "what is logically and empirically true, but what the individual feels and needs" (p.479), and meeting these needs could result in cognitive and emotional processing (Arntz, 2011). An alternative view to explain the benefits of completing behavioural urges in ImRs is that to alleviate distress, an individual must pass through the immobility response occurring during trauma, to become mobile and functional again (Levine, 1997). This raises the question of whether this could be achieved through mental imagery, considering research demonstrating the overlap between perceiving and imagining (Ganis et al., 2004).

Change to metacognitive insight and level of self-efficacy (focused codes 2.6 and 2.7). Other potential mechanisms of action were an increase in metacognitive insight and self-efficacy (Bandura, 1977; Flavell, 1979). Some participants developed insight that control over their memories was possible by creating an alternative ending. Participants' belief in their ability to do so varied. Further benefits were evident if this ability extended from the traumatic memory being rescripted to other traumatic memories and distressing thought processes more generally.

Research has already highlighted the importance of metacognition and self-efficacy in PTSD treatment. A metacognitive approach has been developed, which focuses less on conventional reliving of the trauma and modifying cognitions, and more on promoting a more adaptive thinking and behavioural style (Wells, 2000; Wells & Sembi, 2004). This is in line with Brewin's (2006) suggestion that negative thinking does not need to be corrected, but disengaged from. Furthermore, Benight and Bandura (2004) suggested perceived self-efficacy of coping to be a key mediator of recovery following a traumatic event. They proposed 'thought control efficacy', linked to the idea that what is detrimental to emotional well-being is not the frequency of anxious cognitions but the inability to control them. Therefore, increasing control over trauma memories and thought processes through rescripting will alleviate distress. Similarly, Salter (2014) found that individuals who experienced a sense of control over their images felt less distressed. Participants in this study also found that they gained a sense of power and control within the rescripts (focused code 6.2), which could further contribute to positive beliefs about control. Research has shown that imagining mastery over threats builds coping self-efficacy (Bandura, Adams, Hardy, & Howells, 1980). Research has suggested that the sense of control gained through rescripting might then be utilised more broadly, resulting in further positive emotions and outcomes (Rusch et al., 2000). Importantly, one participant did find that this sense of control in the rescript extended to life more generally. This is a long-term beneficial outcome of ImRs and likely to be important to promote in therapy.

What factors create an effective rescript?

Pre ImRs session.

Factors preceding ImRs (theoretical code 1). Participants suggested that characteristics of the trauma memory, such as the time since the trauma, the level of distress, and the completeness of the memory, affected ImRs (focused code 1.1). Mixed findings exist regarding the effect of time since the trauma on treatment outcomes, with some research suggesting the longer ago the trauma, the worse the outcome (Duffy et al., 2007; Ehlers et al., 2013) and other research finding no effect (Ehlers et al., 2005). While the nature of the memory was not discussed in relation to a specific theory of memory change, animal research has demonstrated boundaries of reconsolidation (Dudai, 2006), whereby older and stronger memories are less amenable to reconsolidation (Eisenberg & Dudai, 2004; Suzuki et al., 2004). In line with this, Brewin (2015) suggested that effects of reconsolidation might not occur with memories that people have "recalled and perhaps ruminated over dozens if not hundreds of times" (p.21). However, to the author's knowledge, the longevity of the trauma memory has not yet been examined in relation to ImRs outcomes.

Participants also suggested that a positive attitude to treatment, change, and the ImRs technique itself increased ImRs effectiveness, which makes intuitive sense (focused codes 1.2 and 1.3). These findings fit with the long-standing theory of stages of change (Prochaska & DiClemente, 1983; 1986), demonstrating an association between readiness to change and therapeutic outcomes. Furthermore, ten Napel-Shultz et al. (2011) interviewed individuals with a diagnosis of PD regarding preparatory imagery techniques for ImRs. They found that participants felt unclear about the explanation of imagery work initially, which increased their anxieties. Salter

(2014) suggested that ImRs was less effective when individuals were reluctant to introduce change.

During ImRs session.

Individual differences (theoretical code 2). Participants discussed multiple individual differences that moderated the effectiveness of ImRs. A high level of ability in imagining the rescript was felt to increase effectiveness (focused code 2.1). In line with this, previous research has suggested a low visualisation ability to be a barrier to imagery techniques (ten Napel-Shultz et al., 2011). Research has shown trait differences in imagery ability (Reisberg, Pearson, & Kosslyn, 2003) and a clear link has been demonstrated between mental images and emotion (Holmes et al., 2008; Holmes and Matthews, 2010). It is possible, therefore, that those with high imagery abilities could experience stronger positive emotional experiences during ImRs.

Being able to believe in the rescript was also found to increase ImRs effectiveness (focused code 2.2). Previous research has suggested that if participants were unable to relate to a rescript because it was not believable, they were unlikely to experience a reduction in symptoms, although this was not examined statistically (Salter, 2014; Medin, 2015). This could be due to the emotional change in the rescript not being believed and therefore it not updating the original emotion experienced at the time of the trauma. Some participants found that they believed in a realistic rescript and others in a rescript not possible within the constraints of time and space. This fits with existing suggestions that therapists give individuals the choice of what the rescripts should include, with the possibility of using something completely surreal.

Low mood was found to compromise the effectiveness of ImRs (focused code 2.3) by diminishing an individual's ability to complete ImRs initially and to later access the rescript, which then led to further low mood. Variable effects have been found of low mood on PTSD treatment, with some research suggesting a detrimental effect (Duffy et al., 2007; Ehlers et al., 2013) and others not finding this (Ehlers et al., 2005). Ehlers et al. (2013) suggested that low mood may only moderate treatment outcomes if it is so severe that it affects activity levels and motivation to complete tasks between sessions, which might then need to be addressed prior to commencing ImRs.

A high level of dissociation was reported as decreasing the effectiveness of ImRs (focused code 2.4). Dissociation currently has no clear definition (Spitzer, Barnow, Freyberger, & Grabe, 2006) but has been conceptualised as an evolutionary based mechanism, adaptive at the time of the trauma (Schauer & Elbert, 2010). Arntz (2011) suggested that dissociation can be a barrier to ImRs by preventing information processing, for example, by preventing the fear network being activated and new information being incorporated (Foa & Kozack, 1986; Foa et al., 1989). However, it has been suggested that dissociation during ImRs tends to reduce over time (Arntz & Weermtan, 1999). Conversely, research has also shown that high levels of dissociation did not impede an exposure-based treatment for PTSD (Hagenaars, van Minnen, & Hoogduin, 2010). This is in line with one participant who did not find dissociation to be a problem when rescripting.

Importantly, participants also found that they needed a high level of motivation to change the ending, to believe the rescript, and to practise the rescript at home (focused code 2.5). Needing a high level of motivation was closely linked to attitudes

prior to ImRs (focused codes 1.2 and 1.3) but was particularly relevant during a rescripting session. Unsurprisingly, Salter (2014) also found that being motivated and engaged with ImRs increased effectiveness.

The importance of the therapeutic structure (theoretical code 3). Participants felt that conducting ImRs in the latter stages of treatment increased effectiveness, due to feeling more ready for the technique (focused code 3.1). Furthermore, they felt that ImRs should follow 'reliving' of the memory through IE. Participants felt 'reliving' was important to achieve a complete memory, to not deny reality, and to gain extra knowledge to use during ImRs. It is possible that completing IE first would decrease distress and promote a less fragmented memory (Hackmann, 2011), which could in turn increase ImRs effectiveness (focused code 1.1). Research has found IE, and IE and ImRs combined, were equally effective in reducing PTSD symptoms (Arntz et al., 2007). While this study did not demonstrate any extra benefit of ImRs on PTSD symptoms, no research has yet compared IE and ImRs, and ImRs alone. However, other research has demonstrated ImRs to be an effective stand-alone technique, without a specific IE component (Arntz et al., 2013; Raabe et al., 2015).

Linked to this, participants viewed ImRs as part of a treatment package, feeling therapeutic change occurred due to a combination of techniques, not solely ImRs (focused code 3.3). Some participants suggested that work with cognitions was also important and could also be used to enhance the rescript. Perhaps planning the rescript first, to target maladaptive cognitions and include previous cognitive work, could aid this (Ehlers & Clark, 2000), rather than a more 'in vivo' approach (Arntz & Weertman, 1999). However, to the author's knowledge, no research yet exists that

compares these two preparation approaches to rescripting. Also related to viewing ImRs as part of a larger set of techniques was one participant's sense that it was important to address the person as a whole and not just the memory. It is likely, particularly with more 'complicated' or 'complex' PTSD presentations, this may require more than just ImRs. However, it should be considered that these preferences were in line with participants' treatment. It is unlikely that they would be able to compare this with ImRs as a stand-alone technique, to decide upon a preference, without experiencing both.

Where the traumatic memory should begin to be changed, that is, when the rescript should begin, varied by individual preference (focused code 3.2). Some participants would have liked support from the rescript earlier, more in line with 'pre-emptive' rescripting ideas (Arntz et al., 2013; Arntz & Weertman, 1999). Some participants felt it was relevant to rescript just before the worst moment, in line with the 'warning signal' hypothesis (Ehlers et al., 2002). This hypothesis suggests that intrusions are from stimuli present moments before the moment with the largest emotional impact, for example, stimuli if experienced again would suggest impending danger. Finally, some participants reported needing to relive the worst moments before rescripting to achieve a contrast between bad and good, with the bad enhancing the good. Clearly, it is important for therapists to carefully formulate what would be most beneficial before commencing rescripting. There are multiple clinical factors to consider, such as sufficient memory activation, whether an individual can tolerate exposure to the memory, and possibly unexpected timing of the rescript, as this could promote reconsolidation (Ecker, 2015; Finnie & Nadar, 2012).

The importance of the therapist (theoretical code 4). Participants felt that a high level of trust in the therapist increased ImRs effectiveness (focused code 4.1). This is unsurprising considering a wealth of research highlighting the importance of the therapeutic relationship in increasing treatment effectiveness (Horvath & Luborsky, 1993; Gilbert & Leahy, 2007; Lambert & Barley, 2001). This is likely to be particularly relevant when working with PTSD, as the nature of the traumatic event may have led individuals to find it difficult to establish trust, and creating a safe environment to process traumatic memories is essential (Courtois, 2004). This suggests therefore that the timing of ImRs in treatment is important (focused code 3.1), as trust needs to be established before commencing the technique. Brewin et al. (2009) anecdotally suggested this to be important when using ImRs.

Participants varied in the amount of support and guidance they required for ImRs to be effective (focused code 4.2). As would be expected, participants wanted the therapist's support with rescripting, which increased effectiveness. Clinically therapists would support individuals outside of the memory in making decisions regarding what and when to rescript, and within the memory, with questions regarding the individual's senses, emotions, cognitions and needs (Arntz & Weertman, 1999). However, some participants suggested that they felt unable to complete ImRs outside of therapy sessions without guidance from the therapist, clearly linking to self-efficacy as a mechanism of action (focused code 2.7) and a decrease in ImRs effectiveness. This balance is something to consider clinically, aiming to both support the individual and facilitate the on-going use of ImRs outside of sessions.

Linked to this, some participants also felt supported by using the therapist in the rescript itself (focused code 4.3). Certain participants wanted the therapist to be present in the rescript and for them to take more of a leading role in making changes. Arntz (2012) suggested that whether the individual or a trusted other rescripts needs to be explored further and may depend on the type of person and type of memory. This is important to consider as Salter (2014) suggested that individuals who instigate change themselves have the greatest decrease in symptoms. One participant for whom the therapist acted as a force of change in the rescript specifically mentioned that they were rescripting a childhood memory. Research has suggested the importance of the therapist providing support and care in the rescript when rescripting childhood memories (Arntz, 2011). This is because following childhood experiences, certain individuals may be unable to be able to provide this care for themselves, due to the lack of adaptive schemas (Young, Klosko, & Weishaar, 2003). However, the therapist being present in the rescript and intervening has also been used with traumas occurring in adulthood (e.g., Arntz et al., 2013). Clarity regarding when it is most beneficial for the therapist to intervene in the rescript is required.

Creating an effective rescript (theoretical code 5). Particularly when rescripting traumatic events that occurred in adulthood, participants highlighted the importance of considering and choosing the change themselves (focused code 5.1). Arntz and Weertman (1999) found that individuals can "more easily discard the corrective actions of others" (p.724) and self-generated ideas have been suggested to be more believable than those generated by others (Nisbett & Ross, 1980). One participant discussed how the association between the original traumatic memory and the rescript increased if they created a rescript with personal meaning.

Participants generally found that the more vivid the rescript the more effective it was (focused code 5.2). There are multiple factors that could explain the importance of creating a vivid rescript. Firstly, research has shown that the more vivid an image the easier it is to recall (Cornoldi et al., 1992) and that the more something is recalled, the easier it is to do so in the future (Tversky & Khaneman, 1973). This is likely to create a more accessible image that wins retrieval competition over the traumatic memory (Brewin, 2006) or potentially a more powerful reconsolidated memory. Secondly, other therapeutic techniques, such as EMDR and the 'cognitive vaccine' (Holmes et al., 2009; 2010), propose that their effectiveness could rely on the limited capacity of working memory (Baddeley, 2000; 2003). Therapeutic techniques that use visuo-spatial working memory resources compete for resources with traumatic visuo-spatial images, thereby disrupting them. Indeed, tasks needing working memory resources have been shown to disrupt the vividness of negative autobiographical images (Andrade et al., 1997). Furthermore, vivid images have rich and detailed sensory representation in visuo-spatial and auditory working memory (Baddeley & Andrade, 1988). It is possible, therefore, that the more vivid the image, the more resources it uses, and the more it disrupts the traumatic memory. One participant suggested that if more than one sense was used, so was more *"brain power" (ID9)*, moving them away from the original trauma memory. The same participant found that over time the rescript became more vivid than the trauma memory. Multiple participants suggested that utilising as many senses as possible in the rescript increased a sense of vividness. This is in line with research suggesting that a vivid image "is one that comprises a rich array of quasi-sensory information" (Baddeley & Andrade, 1998). Using different senses in the rescript may be favourable as intrusive images in PTSD also include multiple senses (Ehlers & Steil, 1995). One participant suggested that if

flashbacks were predominantly of a touch sense, a rescript incorporating touch would be particularly beneficial.

Participants had varied experiences of the rescript being in field and observer perspective (focused code 5.3). Using a field perspective appeared to be preferred as it was more intense, participants felt more in control, and were enabled to be the one to make changes in the rescript. McIsaac and Eich (2004) found that traumatic memories viewed from a field perspective, as opposed to an observer perspective, included more emotional, physical and psychological reactions. Moreover, 89% of their participants who used an observer perspective commented that they did so to decrease the horror of the trauma. This suggests that during ImRs a field perspective allows individuals to activate the trauma memory, to enable emotional processing to occur (Rachman, 1980). Brewin et al. (2010) suggested that field and observer perspectives have different neural representations and suggested that an observer perspective makes it less likely an S-rep would be activated. Without this activation the S-rep will be unable to be processed. This poses the question therefore of whether new emotions or a shift in existing emotions are more keenly felt if a field perspective is adopted in the image.

Post ImRs session.

Long-term accessibility of the rescript (theoretical code 8). Following memory change during an ImRs session (theoretical code 7) participants described the subsequent accessibility of the rescript. This was a bidirectional relationship however, as the more participants reported accessing the rescripts (focused code 9.1), the more accessible and strong they became, thereby increasing memory change over time.

It is important to consider what participants' experiences of accessibility suggest regarding different theories of memory change. Many participants discussed having to retrieve the rescript intentionally and, if unsuccessful, experienced the trauma memory (although in a less distressing form). Generally, participants found that the rescripts were available to be intentionally accessed, although this was not always the case. Some participants found that the same rescript was sometimes automatically accessed and other times had to be intentionally retrieved. These experiences all suggest the existence of two memory representations, the original traumatic memory and the rescript, in line with the dual representation theory (Brewin et al., 1996; Brewin et al., 2010). The retrieval competition hypothesis (Brewin, 2006) suggests that as participants had to intentionally access the rescripts, they were not yet accessible enough to win retrieval competition over the trauma memory/original S-rep (Dibbets & Arntz, 2015), in the presence of cues that trigger the trauma memory (Hackmann, 2011). The possibility of retrieving rescripts over memories from the past could be linked to the overlapping neural mechanisms between remembering the past and imagining the future (Schacter, Addis, & Buckner, 2007). However, as previously mentioned, it is possible that even if a memory has been reconsolidated other memory traces exist and it is those that are being accessed (Nadel & Moscovitch, 1997, Moscovitch & Nadel, 1999).

The retrieval competition hypothesis (Brewin, 2006) suggests that therapeutic change occurs by ensuring negative representations are rarely retrieved, and if they are that they are quickly replaced with more positive representations, which should be assisted to win retrieval competition. Brewin et al. (2010) suggested that multiple re-scripting scenarios might have to be undergone to create a C-rep that can both neutralise

negative emotions from the trauma and be more accessible than the original S-rep. It is important, therefore, to consider the multiple factors that increase the accessibility of a memory representation, particularly as the old representations are likely to be well rehearsed (Wheatley & Hackmann, 2011). It has been suggested that one of the primary factors to consider is rehearsal (Brewin, 2006; Wheatley et al., 2007) (focused code 9.1). In addition, the memorability and positivity of the rescript could be important in increasing accessibility (Wheatley et al., 2007).

Alternatively, if the rescript was always automatically accessed and distress alleviated, as was the case for a small number of participants, it is more complicated to ascertain the underlying memory theory. For example, the memory representation may have been changed, resulting in the new changed meaning always being accessed (Arntz, 2012) (focused code 7.1). Alternatively, a new, less distressing memory may have been created that was then consistently more accessible (focused code 7.2) (Brewin et al., 1996; Brewin et al., 2010). Other research has also found this automatic accessibility following ImRs, with participants experiencing difficulties retrieving only the original traumatic memory, without the rescript, following ImRs (Rusch et al., 2000). Clearly, it is not straightforward to differentiate between retrieval competition and reconsolidation accounts of memory change, particularly if the factual representations of the traumatic event remain intact even when the meaning has fundamentally changed (Arntz, 2012). This study did suggest that a limited number of participants experienced change to the original memory, however, future research must clarify the underlying mechanisms of memory change further.

Enhancing continued use of ImRs (theoretical code 9). Participants highlighted the importance of rehearsing the rescript (focused code 9.1) to enable it to grow in accessibility and strength (focused code 8.3). As mentioned, a key factor in increasing accessibility of a memory representation is rehearsal (Brewin, 2006; Wheatley et al., 2007). Often in clinical sessions individuals are advised to listen back to the rescript between sessions (Smucker et al., 1995) and these results suggest that this should be encouraged. The positive effects of rehearsal suggest that the aim is to increase the accessibility of a new memory (Brewin, 2006), although rehearsal could also be beneficial in increasing accessibility of a reconsolidated memory. Linked with this was the finding that nearly all participants found using rescripting 'aids' beneficial, such as drawings and images on mobile phones of the rescript (focused code 9.3). Brewin (2006) proposed that memory representations with a stronger link to a retrieval cue are more likely to win retrieval competition. This suggests that therapists could consider creating retrieval cues with participants in sessions to promote later accessibility of the rescript.

Interestingly, participants also suggested the importance of gaining autonomous rescripting skills over time, to be able to make changes themselves outside of sessions (focused code 9.2). Some participants had begun to rescript autonomously and were finding it very beneficial. One participant shared that this was important as new threats/needs could arise in an already rescripted memory at a later time. Arntz (2012) highlighted the importance of ensuring all needs are met within the rescript, however, threats arising later should also be considered. Largely, ImRs protocols do not specify that individuals should be encouraged to autonomously complete rescripts between sessions. However, there are exceptions, such as a self-help workbook teaching

strategies to address nightmares, based on imagery rehearsal therapy (Krakow & Krakow, 2002). However, Krakow suggested that autonomously completing the imagery work might only be suitable for those who are less distressed and/or have had previous psychotherapy experience (Krakow, 2003). Future research should carefully consider whether developing autonomous rescripting skills would be beneficial or whether ImRs should largely be completed with therapist support. This is likely to be linked to multiple factors, including the individual's self-efficacy (focused code 2.7).

Participants also discussed using the rescripted image more broadly, separately from the originally rescripted memory (focused code 9.4). Participants appeared to be using the rescripts in a similar way to the concept of a 'perfect nurturer' (Lee, 2005). This technique involves imagining a compassionate and soothing image to promote the individual feeling compassion and warmth for themselves. Using the rescripts more widely was clearly very beneficial for participants. However, one participant felt the need to protect the rescript by not allowing the image into future traumatic memories, demonstrating a downside of creating a meaningful separate image.

Generally, participants felt positive about the rescripting process after completing it (focused code 9.5). Other research examining the experience of imagery techniques found that although initially participants had a more negative view of imagery techniques, through practising ImRs they understood the procedure, felt less fearful of it, and acknowledged its effectiveness (Arntz, 2011; ten Napel-Schutz et al., 2011). Importantly, participants suggested that their attitude to future rescripts improved once early rescripting was successful. It is important, therefore, to complete ImRs at the correct time for an individual within treatment, to avoid any sense of failure

ensuing (focused code 3.1). This highlights that ImRs should be considered an iterative process, whereby the success of one rescript leads into the next, and so on.

Can links between specific mechanisms of action and effectiveness factors be ascertained? Participants generally described effectiveness factors as affecting ImRs generally, without linking these to a specific mechanism of action. However, it was clear that some effectiveness factors directly affected specific mechanisms of action (Appendix 14). As demonstrated in Figure 2 'long-term accessibility of the rescript' (theoretical code 8) was a result of 'memory change mechanism' (theoretical code 7) but, through rehearsal, also moderated memory change over time. Participants also suggested that if they depended on a high level of support from the therapist (focused code 4.2) this could result in them feeling unable to rehearse the rescript (focused code 9.1) or develop skills to rescript (focused code 9.2) outside of sessions. This is, therefore, linked to participants' self-efficacy (focused code 2.7) in rescripting. While this study has gone some way to suggest possible mechanisms of action of ImRs, it is clear more research is needed, including to clarify which effectiveness factors specifically moderate which mechanisms of action.

Strengths

Originality. This is one of a limited number of studies that has examined the potential mechanisms of action and the effectiveness factors of the ImRs technique. Salter (2014) and Medin (2015) have done so, however these studies used a case series and 'dismantling' designs respectively. Furthermore, to the author's knowledge, the only two qualitative studies in the area examined preparatory imagery techniques for ImRs (ten Napel-Shultz et al., 2011) and ImRs linked to emotional

processing (Agbuis, 1996). This study therefore is the first qualitative study to examine the mechanisms of action and effectiveness factors of ImRs. Importantly, this is therefore the first model to be generated with the aim of furthering theoretical and clinical understanding (Figure 2). It is hoped that learning from individuals who have personally experienced ImRs will provide a rich and detailed understanding of the technique.

Sample heterogeneity. Another strength of the study was the heterogeneity of the sample. Participants were a mix of genders (40% male, 60% female), from Western and non-Western cultures, had experienced a different number of traumatic events, had experienced traumas of different durations, had varied amounts of time pass since the trauma, had experienced a widely varied number of treatment and ImRs sessions and were at different stages of the treatment process (40% discharged, 60% still in treatment). Although GT aims mainly for the model to be relevant to the sample and not representative of a population (Charmaz, 2014; Corbin & Strauss, 1990) conducting the interviews with such a diverse sample does increase the clinical generalisability of the findings. However, all participants had either experienced multiple or sustained traumatic events, or single events linked to other traumatic events in the past. This is likely to have resulted in a sample with more 'complicated' presentations of PTSD, including some participants who would meet criteria for 'complex' PTSD. It has been suggested that individuals with 'complex' PTSD, have been exposed to repeated or prolonged instances of interpersonal trauma, and in addition to PTSD symptoms, also have difficulties with self-regulatory capacities (Cloitre, Courtois, & Ford, 2012). This could have affected the nature of the traumatic memory (focused code 1.1) and resulted in participants having a higher than average

number of treatment sessions (NICE, 2005), which should be considered when interpreting the findings.

Limitations

Theoretical sufficiency and theoretical sampling. One of the major limitations of the study was not appearing to have reached data saturation, or sufficiency (Dey, 1999), in line with a GT methodology (Charmaz, 2014). Wiener (2007) suggested that data saturation is a judgement that takes into account situational factors surrounding the study, such as having a limited time period. Charmaz (2014) suggested that a small study with "modest claims" (p.214) might result in earlier data saturation; however, with broad research questions such as those in this study, it cannot be claimed that theoretical sufficiency has been obtained in the time available. To claim theoretical sufficiency has been reached, a study must have fully adopted theoretical sampling to determine whether new information is emerging (Charmaz, 2014). Theoretical sampling was considered where possible in this study, in relation to recruiting those with varied experiences of the effectiveness of ImRs and a range of time having elapsed since completing ImRs. However, given more time, there are multiple areas in which theoretical sampling could have been used to further saturate categories. For example, it would have been informative to recruit further participants who rescripted a childhood memory to ascertain if they indeed wanted a higher level of support and guidance in therapy (focused code 4.2) and a higher level of therapist presence in the rescript (focused code 4.3) and if this then resulted in lower levels of self-efficacy (focused code 2.7). This could then have been compared to those rescripting traumas occurring in adulthood. Furthermore, there were many areas where more interviews would have been beneficial, for example, further exploring

memory change more generally and the idea of a break or cut off point in the memory more specifically (focused code 7.3).

Quality standards. Quality standards for qualitative research were followed throughout the study (Elliot et al., 1999). However, there are limitations in line with these that should be considered when interpreting the results. Firstly, regarding 'owning your own perspective,' the researcher wrote a reflective research diary and memos throughout the research process (Appendix 6), to ensure subjectivity did not unduly influence the codes generated (Charmaz, 2014). However, conducting a literature review prior to the interviews increased the likelihood of prior knowledge influencing the results (Glaser & Strauss, 1967). Moreover, the researcher was working in a trauma service throughout the majority of the study, using ImRs clinically, and was receiving individual and peer supervision regarding ImRs weekly. Despite efforts to prevent existing knowledge and theory from influencing the generation of codes, it is possible that this occurred to some extent, particularly regarding memory change. Secondly, regarding 'providing credibility checks', 'coherence' and 'resonance with the reader' the researcher sent a summary of the results and the model to participants for feedback prior to the completion of the study. Unfortunately, no participants were able to feedback in time for that information to be incorporated, potentially affecting the quality of the results.

Study design considerations. There were multiple issues with the design of the study that may have influenced the results. Firstly, prior to completing the ImRs technique all participants had 'relived' the memory using IE. This is routine treatment in the service and was an inclusion criterion to ensure all participants had undergone

similar treatment prior to interview. However, due to this it is not possible to clearly ascertain how much therapeutic change was due to ImRs and how much due to other techniques. Secondly, participants' understanding of the mechanisms of action of ImRs was likely to depend somewhat on the rationale provided by therapists in the service. This did not appear to have affected the results to a detrimental extent, but should be considered when interpreting them.

Clinical Implications

Numerous clinical implications arose from the findings and a few key ideas will be considered here. Possible factors to consider in ImRs sessions are presented in Table 4, which could differ in future research with a different sample. Firstly, the majority of participants discussed the sense that two memories existed following ImRs, and they often needed to intentionally access the rescript. This suggests that it would be beneficial for therapists to consider making the rescript as accessible as possible, perhaps through considering vividness, perspective, memorability, positivity, and promoting rehearsal between sessions. Brewin (2006) suggested that therapists should explain the role played by unwanted memory representations and aid with strategies to limit their activation. Secondly, almost all participants discussed their felt sense changing due to rescripting, with less of a focus on cognitive change, although cognitions may well have changed as a result (Hackmann et al., 2011). This suggests that ImRs should focus on changing the emotion or feeling state associated with the traumatic event, rather than directly targeting maladaptive cognitions related to the trauma. Thirdly, some participants discussed finding the therapist being present in the rescript and deciding upon the change very helpful, whereas others valued deciding upon and creating the change themselves. It is likely that the therapist leading the

rescript is more beneficial when rescripting childhood memories (Arntz, 2011), but not enough interviews were possible within the time constraints to determine factors that affected this more clearly. Therefore, it is important for therapists to carefully formulate what is most beneficial for the individual before rescripting.

Table 4.
Possible considerations for therapists when using ImRs.

Possible considerations for therapists when using ImRs
Before an ImRs session
Take time to increase understanding of the rationale and promote positive attitudes to the ImRs technique
During an ImRs session
Aim to create a rescript that is believable to the individual
Consider the effects of an individual's mood on rescripting
Develop strategies to manage dissociation if necessary
Consider ways to increase motivation: to complete the technique, to believe the rescript and to practise at home
Promote the development of metacognitive insight in rescripting and more generally (potential mechanism of action)
Promote self-efficacy in rescripting and more generally (potential mechanism of action)
Use ImRs in the latter stages of treatment, following reliving
Formulate what would be the best time for the rescript to begin within the memory
Combine ImRs with other therapeutic techniques
Take time to build trust and a safe and supportive environment
Formulate the most appropriate level of support/guidance for the individual
Formulate whether a therapist presence in the rescript would be beneficial
Formulate whether the individual or the therapist should decide on the change
Create a vivid rescript
Promote a field perspective in the rescript
Promote change to an individual's felt sense through: changing key emotions, changing feeling states and completing behavioural urges (potential mechanism of action)
Promote this felt sense change in life more generally
Promote memory change (potential mechanism of action)
After an ImRs session
Promote on-going rehearsal to increase the accessibility of the rescript
Consider the development of rescripting 'skills'
Use rescripting aids: to create the rescript and to cue the rescript
Formulate whether it would be beneficial to use the rescripted image more broadly
Discuss and promote a positive attitude to ImRs following rescripting to encourage future rescripts

Future Research

Possible areas for future research have been considered and key areas will be discussed here. Firstly, as mentioned when discussing limitations, all participants had undergone other therapeutic techniques prior to rescripting. Therefore, it is not possible to gain an unconfounded account of change due solely to ImRs. This may be more relevant for examining mechanisms of action than effectiveness factors, for example, it may be difficult to determine what extent of memory change is due to ImRs. A further qualitative study with individuals who are undergoing ImRs as a stand-alone treatment for PTSD would be beneficial in removing confounding therapeutic factors (Arntz et al., 2013; Raabe et al., 2015). Secondly, participants suggested that developing autonomous rescripting skills was important for the effectiveness of ImRs. While many ImRs protocols suggest individuals should rehearse the rescript (at varying frequencies) (Smucker et al., 1995; Raabe et al., 2015), to the author's knowledge, less research has examined promoting the development of 'rescripting skills' (although see Krakow & Krakow, 2002). Future research could examine whether this would only be beneficial for certain individuals, the positives and negatives of doing so, how to best implement improving autonomous rescripting skills, and the longitudinal effects of doing this over time. Thirdly, participants discussed the effects of ImRs generalising to life more broadly. This included developing metacognitive insight and self-efficacy regarding changing a specific traumatic memory extending to thought processes more generally, and it was even alluded to that other aspects of life then felt more controllable. Similarly, participants discussed that the feeling experienced in the rescript was felt in life more generally, such as less anger and less guilt. Future research could examine how the effects of ImRs extend beyond the rescripted memory. Fourthly, as previously

mentioned it would be important to delineate further which effectiveness factors relate to which mechanisms of action specifically. Furthermore, the categorisation of mechanisms of action and effectiveness factors, while arising from the data, is inevitably affected by the researcher's subjectivity. Therefore, future research should further explore these concepts in ImRs to compare similarities and differences with this initial study.

Personal Reflections

Reflecting on the researcher's role is important throughout a GT study. Charmaz (2014) suggested, "reflexivity includes examining how the researcher's interests, positions and assumptions influenced his or her inquiry" (p.344). This occurred through regularly considering how my personal context may have impacted the data, through discussions with supervisors and peers and writing a reflective research diary (Appendix 6).

Throughout the interviewing process I was struck by how emotive discussing the ImRs technique was for participants, more so than the already emotional interviews I had anticipated. I also felt acutely aware that I was asking people to trust me with their most personal and distressing thoughts and feelings, having only just met me. At times this felt like a fragile situation and I tried hard to manage this, not wanting to push people too much but also remaining curious to learn more about their experiences. My experience of concurrently working in a trauma service meant it was easy to fall into a clinical rather than a research role. This may have led me to ask further questions about emotional distress and/or conversely avoid asking certain emotive questions, feeling very aware of the limited time in which to complete the

research interviews. I attempted to manage this through reflection in research supervision and consideration in my reflective research diary. Conversely, some clinical skills proved beneficial, such as an awareness of the importance of trust, an awareness of how best to manage dissociation, and having a detailed understanding of the ImRs technique. This knowledge may have helped participants feel more comfortable and able to share their experience. Furthermore, I felt that empathising, as I would in a clinical session, was respectful of participants' experiences (Charmaz, 2006).

Conducting a GT study for the first time felt overwhelming. The amount of data generated, from 10 90-minute interviews, felt extensive to someone inexperienced in this area. I constantly felt privileged to learn of peoples' experiences and during writing up the study I felt a weight of responsibility to maintain and express the varying views of participants. I frequently considered what their perspective on the write-up might be and hoped it would be acceptable to them. This may have lead to me being over-inclusive with the information, not yet feeling confident in my decisions of which codes to raise to higher categories. I managed this by cross-checking the codes with the research supervisors, a trainee working in a similar area, and ultimately asking the participants themselves.

Summary and Conclusions

In summary, nine theoretical codes and 34 focused codes emerged from the 10 interviews conducted. The results suggested potential mechanisms of action of ImRs to be change to an individual's memory representations, change to their felt sense and change to their metacognitive insight and self-efficacy. It was not possible to clearly

elucidate the underlying memory change. However, the majority of participants experienced a sense of two memories existing following ImRs, with some participants experiencing something closer to change to the original traumatic memory. Multiple factors that moderated the effectiveness of the technique were also determined, in stages before, during and after a rescripting session. These included the theoretical codes of 'factors preceding ImRs', 'individual differences', 'the importance of the therapeutic structure', 'the importance of the therapist', 'creating an effective rescript', 'long-term accessibility of the rescript' and 'enhancing on-going use of ImRs', with multiple focused codes within these. A model is presented (Figure 2) demonstrating the ImRs process, including these potential mechanisms of action and effectiveness factors. Furthermore, this includes a feedback loop demonstrating the iterative nature of the ImRs process, with factors present after one rescript feeding back in and affecting the next, and so on.

Research in this area is in its infancy and future research could consider examining the mechanisms of action and effectiveness factors of ImRs without the confounds of other therapeutic techniques, the implications of autonomous rescripting and the effects of rescripting more broadly in individuals' lives. Importantly, and more closely linked to the research questions, future research could build on this study to further determine the mechanisms of action and clarify the links between those and the suggested effectiveness factors. It is hoped that by learning from those who have personal experience of the technique this study can increase the theoretical understanding of ImRs and in turn, increase future clinical effectiveness.

References

Agbuis, C. M. (1996). *Imagery rescripting and incest: Therapist dialogue and contextual unique change in women clients with post-traumatic stress* (Unpublished doctoral dissertation). Loyola University of Chicago: Chicago, IL.

Agren, T., Engman, J., Frick, A., Björkstrand, J., Larsson, E.-M., Furmark, T., & Fredrikson, M. (2012). Disruption of reconsolidation erases a fear memory trace in the human amygdala. *Science*, *337*(6101), 1550-1552.

American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders (5th ed.)*. Washington, DC: American Psychiatric Publishing.

Andrade, J., Kavanagh, D., & Baddeley, A. (1997). Eye-movements and visual imagery: A working memory approach to the treatment of post-traumatic stress disorder. *British Journal of Clinical Psychology*, *36*(2), 209-223.

Arntz, A. (2011). Imagery rescripting for personality disorders. *Cognitive and Behavioral Practice*, *18*(4), 466-481.

Arntz, A. (2012). Imagery rescripting as a therapeutic technique: Review of clinical trials, basic studies, and research agenda. *Journal of Experimental Psychopathology*, *3*(2), 189-208.

Arntz, A. (2014). Imagery rescripting for post-traumatic stress disorder. In N. C. Thoma & D. McKay (Eds.), *Working with emotion in cognitive-behavioral therapy: Techniques for clinical practice* (pp. 203-216). New York, NY: Guilford Publications.

Arntz, A., Sofi, D., & van Breukelen, G. (2013). Imagery rescripting as treatment for complicated PTSD in refugees: A multiple baseline case series study. *Behaviour Research and Therapy*, *51*(6), 274-283.

Arntz, A., Tiesema, M., & Kindt, M. (2007). Treatment of PTSD: A comparison of imaginal exposure with and without imagery rescripting. *Journal of Behavior Therapy and Experimental Psychiatry*, *38*(4), 345-370.

Arntz, A., & Weertman, A. (1999). Treatment of childhood memories: Theory and practice. *Behaviour Research and Therapy*, *37*(8), 715-740.

Baddeley, A. D. (2000). The episodic buffer: a new component of working memory? *Trends in Cognitive Science, 4*(11), 417-423.

Baddeley, A. D. (2003). Working memory: looking back and looking forward. *Nature Reviews Neuroscience, 4*, 829-839.

Baddeley, A. D., & Andrade, J. (1998). Working memory and consciousness: An empirical approach. In M. A. Conway, S. E. Gathercole & C. Cornoldi (Eds.), *Theories of memory: Volume II* (pp. 1-24). Hove: The Psychology Press.

Baddeley, A. D., & Andrade, J. (2000). Working memory and the vividness of imagery. *Journal of Experimental Psychology: General*, *129*(1), 126-145.

Bandura, A. (1977). Self-efficacy: toward a unifying theory of behavioral change. *Psychological Review, 84*(2), 191-215.

Bandura, A., Adams, N. E., Hardy, A. B., & Howells, G. N. (1980). Tests of the generality of self-efficacy theory. *Cognitive Therapy and Research, 4*(1), 39-66.

Beck, A. T. (Ed.). (1979). *Cognitive therapy of depression*. New York, NY: Guilford press.

Beck, A. T., Steer, R. A., & Brown, G. K. (1996). *Manual for the Beck Depression Inventory-II*. San Antonio, TX: Psychological Corporation.

Belardinelli, M. O., Palmiero, M., Sestieri, C., Nardo, D., Di Matteo, R., Londei, A., ... Romani, G. L. (2009). An fMRI investigation on image generation in different sensory modalities: the influence of vividness. *Acta Psychologica, 132*(2), 190-200.

Benight, C. C., & Bandura, A. (2004). Social cognitive theory of posttraumatic recovery: The role of perceived self-efficacy. *Behaviour Research and Therapy, 42*(10), 1129-1148.

Bennett-Levy, J. (2003). Mechanisms of change in cognitive therapy: The case of automatic thought records and behavioural experiments. *Behavioural and Cognitive Psychotherapy, 31*(03), 261-277.

Birks, M., & Mills, J. (2011). *Grounded theory: A practical guide*. London: Sage Publications.

Bourne, C., Frasquilho, F., Roth, A. D., & Holmes, E. A. (2010). Is it mere distraction? Peri-traumatic verbal tasks can increase analogue flashbacks but reduce voluntary memory performance. *Journal of Behavior Therapy and Experimental Psychiatry*, *41*(3), 316-324.

Bouton, M. E. (1993). Context, time, and memory retrieval in the interference paradigms of Pavlovian learning. *Psychological Bulletin*, *114*(1), 80-99.

Bouton, M. E. (2002). Context, ambiguity, and unlearning: sources of relapse after behavioral extinction. *Biological Psychiatry, 52(10)*, 976-986.

Brewer, W. F. (1996). What is recollective memory? In D. C. Rubin (Ed.), *Remembering our past: Studies in autobiographical memory* (pp. 19-66). Cambridge: Cambridge University Press.

Brewin, C. R. (2006). Understanding cognitive behaviour therapy: A retrieval competition account. *Behaviour Research and Therapy*, *44*(6), 765-784.

Brewin, C. R. (2015). Reconsolidation versus retrieval competition: Rival hypotheses to explain memory change in psychotherapy. *Behavioral and Brain Sciences*, *38*, 21-22.

Brewin, C. R., Dalgleish, T., & Joseph, S. (1996). A dual representation theory of posttraumatic stress disorder. *Psychological Review*, *103*(4), 670-686.

Brewin, C. R., Gregory, J. D., Lipton, M., & Burgess, N. (2010). Intrusive images in psychological disorders: Characteristics, neural mechanisms, and treatment implications. *Psychological Review*, *117*(1), 210-232.

Brewin, C. R., & Holmes, E. A. (2003). Psychological theories of posttraumatic stress disorder. *Clinical Psychology Review*, *23*(3), 339-376.

Brewin, C. R., Wheatley, J., Patel, T., Fearon, P., Hackmann, A., Wells, A., … Myers, S. (2009). Imagery rescripting as a brief stand-alone treatment for depressed patients with intrusive memories. *Behaviour Research and Therapy*, *47*(7), 569-576.

Brunet, A., Poundja, J., Tremblay, J., Bui, E., Thomas, E., Orr, S. P., ... Pitman, R. K. (2011). Trauma reactivation under the influence of propranolol decreases posttraumatic stress symptoms and disorder: 3 open-label trials. *Journal of Clinical Psychopharmacology*, *31*(4), 547-550.

Bulmer, M. (1979). Concepts in the analysis of qualitative data. *The Sociological Review*, *27*(4), 651-677.

Charmaz, K. (1990). 'Discovering' chronic illness: Using grounded theory. *Social Science & Medicine*, *30*(11), 1161-1172.

Charmaz, K. (2000). Constructivist and objectivist grounded theory. In N. K. Denzin & Y. Lincoln (Eds.), *Handbook of Qualitative Research* (2nd ed.) (pp. 509–535). Thousand Oaks, CA: Sage Publications.

Charmaz, K. (2003). Grounded theory. In J. A. Smith (Ed.), *Qualitative psychology: A practical guide to research methods* (pp. 81-110). London: Sage Publications.

Charmaz, K. (2006). *Constructing grounded theory: A practical guide through qualitative analysis*. London: Sage Publications.

Charmaz, K. (2014). *Constructing grounded theory*. London: Sage Publications.

Cloitre, M., Courtois, C. A., & Ford, J. D. (2012). *The ISTSS Expert Consensus Treatment Guidelines for Complex PTSD in Adults*. Deerfield, IL: International Society for Traumatic Stress Studies.

Conrad, P. (1987). The experience of illness: recent and new directions. *Research in the Sociology of Health Care, 6,* 1-31.

Conway, M. A. (2001). Sensory–perceptual episodic memory and its context: autobiographical memory. *Philosophical Transactions of the Royal Society of London B: Biological Sciences*, *356*(1413), 1375-1384.

Conway, M. A., & Pleydell-Pearce, C. W. (1997). *On the construction of autobiographical memories: The self monitoring system and its neuroanatomical basis*.

Conway, M. A., & Pleydell-Pearce, C. W. (2000). The construction of autobiographical memories in the self-memory system. *Psychological Review*, *107*(2), 261-288.

Cooper, M. J., Todd, G., & Turner, H. (2007). The effects of using imagery to modify core emotional beliefs in bulimia nervosa: An experimental pilot study. *Journal of Cognitive Psychotherapy*, *21*(2), 117-122.

Corbin, J., & Strauss, A. (2008). *Basics of qualitative research: Techniques and procedures for developing grounded theory* (3rd ed.). Thousand Oaks, CA: Sage Publications.

Cornoldi, C., de Beni, R., Cavedon, A., & Mazzoni, G. (1992). How can a vivid image be described? Characteristics influencing vividness judgments and the relationship between vividness and memory. *Journal of Mental Imagery*, *16*(3-4), 89-107.

Courtois, C. A. (2004). Complex trauma, complex reactions: Assessment and treatment. *Psychotherapy: Theory, Research, Practice, Training, 41*(4), 412-425.

Dadds, M. R., Bovbjerg, D. H., Redd, W. H., & Cutmore, T. R. (1997). Imagery in human classical conditioning. *Psychological Bulletin*, *122*(1), 89-103.

Debiec, J., Bush, D. E., & LeDoux, J. E. (2011). Noradrenergic enhancement of reconsolidation in the amygdala impairs extinction of conditioned fear in rats - a possible mechanism for the persistence of traumatic memories in PTSD. *Depression and Anxiety*, *28*(3), 186-193.

Dey, I. (1999). *Grounding grounded theory: Guidelines for qualitative inquiry*. San Diego, CA: Academic Press.

Dibbets, P., & Arntz, A. (2015). Imagery rescripting: Is incorporation of the most aversive scenes necessary? *Memory, 24*(5), 683-695.

Dibbets, P., Poort, H., & Arntz, A. (2012). Adding imagery rescripting during extinction leads to less ABA renewal. *Journal of Behavior Therapy and Experimental Psychiatry*, *43*(1), 614-624.

Dudai, Y. (2004). The neurobiology of consolidations, or, how stable is the engram? *Annual Review of Psychology, 55*, 51-86.

Dudai, Y. (2006). Reconsolidation: the advantage of being refocused. *Current Opinion in Neurobiology*, *16*(2), 174-178.

Dudai, Y. (2009). Predicting not to predict too much: how the cellular machinery of memory anticipates the uncertain future. *Philosophical Transactions of the Royal Society of London B: Biological Sciences*, *364*(1521), 1255-1262.

Duffy, M., Gillespie, K., & Clark, D. M. (2007). Post-traumatic stress disorder in the context of terrorism and other civil conflict in Northern Ireland: randomised controlled trial. *BMJ, 334*(7604), 1147-1150.

Dyregrov, A., & Regel, S. (2012). Early interventions following exposure to traumatic events: Implications for practice from recent research. *Journal of Loss and Trauma*, *17*(3), 271-291.

Ecker, B. (2015). Memory reconsolidation understood and misunderstood. *International Journal of Neuropsychotherapy (IJNPT), 3*(1), 2-46.

Edwards, D. (2007). Restructuring implicational meaning through memory-based imagery: Some historical notes. *Journal of Behavior Therapy and Experimental Psychiatry*, *38*(4), 306-316.

Edwards, D. J. A. (2011). Invited essay: From ancient shamanic healing to 21st century psychotherapy: The central role of imagery methods in effecting psychological change. In A. Hackmann, J. Bennett- Levy, & E. Holmes, *Oxford guide to imagery in cognitive therapy*. Oxford: Oxford University Press.

Ehlers, A., & Clark, D. M. (2000). A cognitive model of posttraumatic stress disorder. *Behaviour Research and Therapy*, *38*(4), 319-345.

Ehlers, A., Clark, D. M., Hackmann, A., McManus, F., & Fennell, M. (2005). Cognitive therapy for post-traumatic stress disorder: Development and evaluation. *Behaviour Research and Therapy*, *43*(4), 413-431.

Ehlers, A., Grey, N., Wild, J., Stott, R., Liness, S., Deale, A., ... Manley, J. (2013). Implementation of cognitive therapy for PTSD in routine clinical care: Effectiveness and moderators of outcome in a consecutive sample. *Behaviour Research and Therapy, 51*(11), 742-752.

Ehlers, A., Hackmann, A., Steil, R., Clohessy, S., Wenninger, K., & Winter, H. (2002). The nature of intrusive memories after trauma: the warning signal hypothesis. *Behaviour Research and Therapy*, *40*(9), 995-1002.

Ehlers, A., & Steil, R. (1995). Maintenance of intrusive memories in posttraumatic stress disorder: A cognitive approach. *Behavioural and Cognitive Psychotherapy*, *23*(03), 217-249.

Eisenberg, M., & Dudai, Y. (2004). Reconsolidation of fresh, remote, and extinguished fear memory in Medaka: Old fears don't die. *European Journal of Neuroscience*, *20*(12), 3397-3403.

Elliott, R., Fischer, C. T., & Rennie, D. L. (1999). Evolving guidelines for publication of qualitative research studies in psychology and related fields. *British Journal of Clinical Psychology*, *38*(3), 215-229.

Finnie, P. S., & Nader, K. (2012). The role of metaplasticity mechanisms in regulating memory destabilization and reconsolidation. *Neuroscience & Biobehavioral Reviews, 36*(7), 1667-1707.

Flavell, J. H. (1979). Metacognition and cognitive monitoring: A new area of cognitive–developmental inquiry. *American Psychologist, 34*(10), 906-911.

Foa, E. B. (1995). *The Posttraumatic Diagnostic Scale (PDS) Manual*. Minneapolis, MN: National Computer Systems.

Foa, E. B., & Kozak, M. J. (1985). Treatment of anxiety disorders: Implications for psychopathology. In A. H. Tuma & J. D. Maser (Eds.), *Anxiety and the anxiety disorders* (pp. 451-452). Hillsdale, NJ: Erlbaum.

Foa, E. B., & Kozak, M. J. (1986). Emotional processing of fear: exposure to corrective information. *Psychological Bulletin*, *99*(1), 20-35.

Foa, E. B., & Riggs, D. S. (1993). Post-traumatic stress disorder in rape victims. *American Psychiatric Press Review of Psychiatry*, *12*, 273-303.

Foa, E. B., & Rothbaum, B. O. (1998). *Treating the trauma of rape: Cognitive behavioral therapy for PTSD*. New York, NY: Guilford Press.

Foa, E. B., Steketee, G., & Rothbaum, B. O. (1989). Behavioral/cognitive conceptualizations of post-traumatic stress disorder. *Behavior Therapy*, *20*(2), 155-176.

Frets, P. G., Kevenaar, C., & van der Heiden, C. (2014). Imagery rescripting as a stand-alone treatment for patients with social phobia: A case series. *Journal of Behavior Therapy and Experimental Psychiatry*, *45*(1), 160-169.

Ganis, G., Thompson, W. L., & Kosslyn, S. M. (2004). Brain areas underlying visual mental imagery and visual perception: An fMRI study. *Cognitive Brain Research*, *20*(2), 226-241.

Gendlin, E. T. (1981). *Focusing* (rev. ed.). New York: Bantam.

Gilbert, P. (2005). Compassion and cruelty: A biopsychosocial approach. In P. Gilbert (Ed.), *Compassion: Conceptualisations, research, and use in psychotherapy* (pp. 9-74). London: Brunner-Routledge.

Gilbert, P., & Leahy, R. L. (Eds.). (2007). *The therapeutic relationship in the cognitive behavioral psychotherapies*. London: Routledge.

Gilbert, P., & Procter, S. (2006). Compassionate mind training for people with high shame and self-criticism: Overview and pilot study of a group therapy approach. *Clinical Psychology & Psychotherapy, 13*(6), 353-379.

Glaser, B. G. (1978). *Theoretical sensitivity: Advances in the methodology of grounded theory*. San Francisco, CA: Sociology Press.

Glaser, B. G. (1992). *Basics of grounded theory analysis*. Mill Valley, CA: Sociology Press.

Glaser, B. G, & Strauss, A. L. (1967). *The discovery of grounded theory: Strategies for qualitative research*. Chicago, IL: Aldine.

Golkar, A., Bellander, M., Olsson, A., & Ohman, A. (2012). Are fear memories erasable?-reconsolidation of learned fear with fear-relevant and fear-irrelevant stimuli. *Frontiers in Behavioral Neuroscience, 6*(80), 1-10.

Gonzalez-Prendes, A. A., & Resko, S. M. (2012). Cognitive-behavioral theory. In S. Ringel & J. R. Brandell (Eds.), *Trauma: Contemporary directions in theory, practice, and research* (pp. 14-40). Thousand Oaks, CA: Sage Publications.

Grey, D. N., & Holmes, E. A. (2008). 'Hotspots' in trauma memories in the treatment of post-traumatic stress disorder: A replication. *Memory*, *16*(7), 788-796.

Grey, N., Holmes, E., & Brewin, C. R. (2001). Peritraumatic emotional 'hot spots' in memory. *Behavioural and Cognitive Psychotherapy*, *29*(03), 367-372.

Grey, N., Young, K., & Holmes, E. (2002). Cognitive restructuring within reliving: A treatment for peritraumatic emotional 'hotspots' in posttraumatic stress disorder. *Behavioural and Cognitive Psychotherapy*, *30*(01), 37-56.

Griffin, M. G., Resick, P. A., Waldrop, A. E., & Mechanic, M. B. (2003). Participation in trauma research: Is there evidence of harm? *Journal of Traumatic Stress, 16*(3), 221-227.

Grunert, B. K., Weis, J. M., Smucker, M. R., & Christianson, H. F. (2007). Imagery rescripting and reprocessing therapy after failed prolonged exposure for post-traumatic stress disorder following industrial injury. *Journal of Behavior Therapy and Experimental Psychiatry*, *38*(4), 317-328.

Grunert, B. K., Smucker, M. R., Weis, J. M., & Rusch, M. D. (2003). When prolonged exposure fails: Adding an imagery-based cognitive restructuring component in the treatment of industrial accident victims suffering from PTSD. *Cognitive and Behavioral Practice*, *10*(4), 333-346.

Hackmann, A. (1998). Working with images in clinical psychology. *Comprehensive Clinical Psychology*, *6*(14), 301-318.

Hackmann, A. (2011). Imagery rescripting in posttraumatic stress disorder. *Cognitive and Behavioral Practice*, *18*(4), 424-432.

Hackmann, A., Bennett-Levy, J., & Holmes, E. A. (2011). *Oxford guide to imagery in cognitive therapy*. Oxford: Oxford University Press.

Hackmann, A., Ehlers, A., Speckens, A., & Clark, D. M. (2004). Characteristics and content of intrusive memories in PTSD and their changes with treatment. *Journal of Traumatic Stress*, *17*(3), 231-240.

Hagenaars, M. A., & Arntz, A. (2012). Reduced intrusion development after post-trauma imagery rescripting; an experimental study. *Journal of Behavior Therapy and Experimental Psychiatry*, *43*(2), 808-814.

Hagenaars, M. A., van Minnen, A., & Hoogduin, K. A. (2010). The impact of dissociation and depression on the efficacy of prolonged exposure treatment for PTSD. *Behaviour Research and Therapy, 48*(1), 19-27.

Halligan, S. L., Michael, T., Clark, D. M., & Ehlers, A. (2003). Posttraumatic stress disorder following assault: The role of cognitive processing, trauma memory, and appraisals. *Journal of Consulting and Clinical Psychology*, *71*(3), 419-431.

Hardwicke, T. E., Taqi, M., & Shanks, D. R. (2016). Postretrieval new learning does not reliably induce human memory updating via reconsolidation. *Proceedings of the National Academy of Sciences*, *113*(19), 5206-5211.

Harper, D. (2013). Reflections on qualitative research in clinical psychology training. *Clinical Psychology Forum, 243*, 20-23.

Herholz, S. C., Halpern, A. R., & Zatorre, R. J. (2012). Neuronal correlates of perception, imagery, and memory for familiar tunes. *Journal of Cognitive Neuroscience, 24*(6), 1382-1397.

Holmes, E. A., Arntz, A., & Smucker, M. R. (2007). Imagery rescripting in cognitive behaviour therapy: Images, treatment techniques and outcomes. *Journal of Behavior Therapy and Experimental Psychiatry*, *38*(4), 297-305.

Holmes, E. A., Brewin, C. R., & Hennessy, R. G. (2004). Trauma films, information processing, and intrusive memory development. *Journal of Experimental Psychology: General*, *133*(1), 3-22.

Holmes, E. A., Grey, N., & Young, K. A. D. (2005). Intrusive images and 'hotspots' of trauma memories in posttraumatic stress disorder: An exploratory investigation of emotions and cognitive themes. *Journal of Behavior Therapy and Experimental Psychiatry*, *36*(1), 3-17.

Holmes, E. A., James, E. L., Coode-Bate, T., & Deeprose, C. (2009). Can playing the computer game 'tetris' reduce the build-up of flashbacks for trauma? A proposal from cognitive science. *PLoS ONE*, *4*(1), e4153.

Holmes, E. A., James, E. L., Kilford, E. J., & Deeprose, C. (2010). Key steps in developing a cognitive vaccine against traumatic flashbacks: Visuospatial tetris versus verbal pub quiz. *PLoS ONE*, *5*(11), e13706.

Holmes, E. A., & Mathews, A. (2005). Mental imagery and emotion: A special relationship? *Emotion, 5*(4), 489-497.

Holmes, E. A., & Mathews, A. (2010). Mental imagery in emotion and emotional disorders. *Clinical Psychology Review*, *30*(3), 349-362.

Holmes, E. A., Mathews, A., Mackintosh, B., & Dalgleish, T. (2008). The causal effect of mental imagery on emotion assessed using picture-word cues. *Emotion*, *8*(3), 395-409.

Horowitz, M. J. (1976). *Stress response syndromes*. New York, NY: Aronson.

Horowitz, M. J. (1986). Stress-Response syndromes: A review of posttraumatic and adjustment disorders. *Psychiatric Services*, *37*(3), 241-249.

Hout, M., Muris, P., Salemink, E., & Kindt, M. (2001). Autobiographical memories become less vivid and emotional after eye movements. *British Journal of Clinical Psychology*, *40*(2), 121-130.

Horvath, A. O., & Luborsky, L. (1993). The role of the therapeutic alliance in psychotherapy. *Journal of Consulting and Clinical Psychology, 61*(4), 561-573.

Hugh-Jones, S., & Gibson, S. (2012). Collecting your data. In C. Sullivan, S. Gibson & S. C. E. Riley (Eds.), *Doing your qualitative psychology project* (pp. 101-126). London: Sage Publications.

Hunt, M., Bylsma, L., Brock, J., Fenton, M., Goldberg, A., Miller, R., … Urgelles, J. (2006). The role of imagery in the maintenance and treatment of snake fear. *Journal of Behavior Therapy and Experimental Psychiatry*, *37*(4), 283-298.

Janoff-Bulman, R. (1992). *Shattered assumptions: towards a new psychology of trauma*. New York, NY: Free Press.

Jaycox, L. H., & Foa, E. B. (1996). Obstacles in implementing exposure therapy for PTSD: Case discussions and practical solutions. *Clinical Psychology & Psychotherapy*, *3*(3), 176-184.

Ji, J. L., Heyes, S. B., MacLeod, C., & Holmes, E. A. (2016). Emotional mental imagery as simulation of reality: Fear and beyond. A tribute to Peter Lang. *Behavior Therapy*. Advance online publication. doi:10.1016/j.beth.2015.11.004

Karp, D. A. (2009). Learning how to speak of sadness. In A. J. Puddephatt, W. Shaffir & S. W. Kleinknecht (Eds.), *Ethnographies revisited: Constructing theory in the field* (pp. 37-47). New York, NY: Routledge.

Kavanagh, D. J., Freese, S., Andrade, J., & May, J. (2001). Effects of visuospatial tasks on desensitization to emotive memories. *British Journal of Clinical Psychology*, *40*(3), 267-280.

Keane, T. M., Zimering, R. T., & Caddell, R. T. (1985). A behavioral formulation of PTSD in Vietnam veterans. *Behavior Therapist, 8*(1), 9-12.

Kim, S.-E., Kim, J.-W., Kim, J.-J., Jeong, B. S., Choi, E. A., Jeong, Y.-G., … Ki, S. W. (2007). The neural mechanism of imagining facial affective expression. *Brain Research*, *1145*, 128-137.

Kindt, M., Buck, N., Arntz, A., & Soeter, M. (2007). Perceptual and conceptual processing as predictors of treatment outcome in PTSD. *Journal of Behavior Therapy and Experimental Psychiatry*, *38*(4), 491-506.

Kindt, M., & Soeter, M. (2013). Reconsolidation in a human fear conditioning study: A test of extinction as updating mechanism. *Biological Psychology*, *92*(1), 43-50.

Kindt, M., Soeter, M., & Vervliet, B. (2009). Beyond extinction: Erasing human fear responses and preventing the return of fear. *Nature Neuroscience*, *12*(3), 256-258.

Kindt, M., van den Hout, M., Arntz, A., & Drost, J. (2008). The influence of data-driven versus conceptually-driven processing on the development of PTSD-like symptoms. *Journal of Behavior Therapy and Experimental Psychiatry*, *39*(4), 546-557.

Kosslyn, S. M. (1994). *Image and brain*. Cambridge, MA: Massachusetts Institute of Technology.

Kosslyn, S. M., Ganis, G., & Thompson, W. L. (2001). Neural foundations of imagery. *Nature Reviews Neuroscience*, *2*(9), 635-642.

Krakow, B. (2003). Imagery rehearsal therapy for chronic posttraumatic nightmares: A mind's eye view. In R. I. Rosner, W. J. Lyddon & A. Freeman (Eds.), *Cognitive Therapy and Dreams* (pp. 89-112). New York, NY: Springer Publishing Company.

Krakow, B., & Krakow, J. (2002). *Turning nightmares into dreams*. Albuquerque, NM: The New Sleepy Times.

Krakow, B., & Zadra, A. (2006). Clinical management of chronic nightmares: Imagery rehearsal therapy. *Behavioral Sleep Medicine*, *4*(1), 45-70.

Lambert, M. J., & Barley, D. E. (2001). Research summary on the therapeutic relationship and psychotherapy outcome. *Psychotherapy: Theory, research, practice, training, 38*(4), 357-361.

Lane, R. D., Ryan, L., Nadel, L., & Greenberg, L. (2015). Memory reconsolidation, emotional arousal, and the process of change in psychotherapy: New insights from brain science. *Behavioral and Brain Sciences*, *38*, e1.

Lang, P. J. (1977). Imagery in therapy: An information processing analysis of fear. *Behavior Therapy*, *8*(5), 862-886.

Lang, P. J. (1979). A Bio-Informational Theory of Emotional Imagery. *Psychophysiology*, *16*(6), 495-512.

Larkin, M., & Thompson, A. R. (2012). Interpretative phenomenological analysis in mental health and psychotherapy research. In A. R. Thompson & D. Harper (Eds.), *Qualitative research methods in mental health and psychotherapy: A guide for students and practitioners (*pp. 99-116). Hove: John Wiley and Sons.

Lee, D. A. (2005). The perfect nurturer: A model to develop a compassionate mind within the context of cognitive therapy. In P. Gilbert (Ed.), *Compassion: Conceptualisations, research and use in psychotherapy*. London: Brunner-Routledge.

Lee, D. A. (2009). Compassion-focused cognitive therapy for shame-based trauma memories and flashbacks in post-traumatic stress disorder. In N. Grey (Ed.), *A casebook of cognitive therapy for traumatic stress reactions* (pp. 230-246). Hove: Routledge.

Lee, D. A., Scragg, P., & Turner, S. (2001). The role of shame and guilt in traumatic events: A clinical model of shame-based and guilt-based PTSD. *British Journal of Medical Psychology*, *74*(4), 451-466.

Levine, P. A. (1997). *Waking the tiger: Healing trauma: The innate capacity to transform overwhelming experiences*. Berkeley, CA: North Atlantic Books.

Lewis, D. J. (1979). Psychobiology of active and inactive memory. *Psychological Bulletin*, *86*(5), 1054-1083.

Long, M. E., Davis, J. L., Springer, J. R., Elhai, J. D., Rhudy, J. L., Teng, E. J., & Frueh, B. C. (2011). The role of cognitions in imagery rescripting for posttraumatic nightmares. *Journal of Clinical Psychology, 67(10)*, 1008-1016.

Long, M. E., & Quevillon, R. (2009). Imagery rescripting in the treatment of posttraumatic stress disorder. *Journal of Cognitive Psychotherapy*, *23*(1), 67-76.

Maren, S. (2011). Seeking a spotless mind: Extinction, deconsolidation, and erasure of fear memory. *Neuron*, *70*(5), 830-845.

Martin, M., & Williams, R. (1990). Imagery and emotion: Clinical and experimental approaches. In P. J. Hampson, D. F. Marks, & J. T. E. Richardson (Eds.), *Imagery: Current developments* (pp. 268–306). London: Routledge.

Mayou, R. A., Ehlers, A., & Hobbs, M. (2000). Psychological debriefing for road traffic accident victims. *The British Journal of Psychiatry*, *176*(6), 589-593.

McGaugh, J. L. (2000). Memory - a century of consolidation. *Science, 287*(5451), 248-251.

McIsaac, H. K., & Eich, E. (2004). Vantage point in traumatic memory. *Psychological Science, 15*(4), 248-253.

McLellan, E., MacQueen, K. M., & Neidig, J. L. (2003). Beyond the qualitative interview: Data preparation and transcription. *Field Methods*, *15*(1), 63-84.

McNally, R. J., Bryant, R. A., & Ehlers, A. (2003). Does early psychological intervention promote recovery from posttraumatic stress? *Psychological Science in the Public Interest*, *4*(2), 45-79.

Medin, E. (2015). Treatment of survivor guilt after trauma using imagery rescripting (Unpublished doctoral dissertation). Royal Holloway, University of London: London.

Michael, T., Ehlers, A., Halligan, S. L., & Clark, D. M. (2005). Unwanted memories of assault: What intrusion characteristics are associated with PTSD? *Behaviour Research and Therapy*, *43*(5), 613-628.

Morse, J. M. (2011). Molding qualitative health research. *Qualitative Health Research, 21*(8), 1019-1021.

Morse, J. M., Stern, P. N., Corbin, J., Bowers, B., Clarke, A. E., & Charmaz, K. (2009). *Developing grounded theory: The second generation (developing qualitative inquiry)*. Walnut Creek, CA: Left Coast Press.

Moscovitch, M., & Nadel, L. (1999) Multiple-trace theory and semantic dementia: Response to K. S. Graham. *Trends in Cognitive Sciences, 3*(3), 87-89.

Mowrer, O. H. (1960). *Learning theory and behavior*. New York, NY: Wiley.

Murray, J., Ehlers, A., & Mayou, R. A. (2002). Dissociation and post-traumatic stress disorder: Two prospective studies of road traffic accident survivors. *The British Journal of Psychiatry*, *180*(4), 363-368.

Nadel, L., & Moscovitch, M. (1997). Memory consolidation, retrograde amnesia and the hippocampal complex. *Current Opinion in Neurobiology, 7*(2), 217-227.

Nadel, L., Samsonovich, A., Ryan, L., & Moscovitch, M. (2000). Multiple trace theory of human memory: Computational, neuroimaging, and neuropsychological results. *Hippocampus, 10*(4), 352-368.

Nader, K., Schafe, G. E., & LeDoux, J. E. (2000). Reply - Reconsolidation: The labile nature of consolidation theory. *Nature Reviews Neuroscience*, *1*(3), 216-219.

National Institute for Health and Clinical Excellence (NICE) (2005). Post-traumatic stress disorder (PTSD). The management of PTSD in adults and children in primary and Secondary Care. *NICE clinical guideline 26*. Retrieved from http://guidance.nice.org.uk/CG26

Nigro, G., & Neisser, U. (1983). Point of view in personal memories. *Cognitive Psychology, 15*(4), 467-482.

Nisbett, R. E., & Ross, L. (1980). *Human inference: Strategies and shortcomings of social judgment*. Englewood Cliffs, NJ: Prentice-Hall.

Ohanian, V. (2002). Imagery rescripting within cognitive behavior therapy for bulimia nervosa: An illustrative case report. *International Journal of Eating Disorders, 31*(3), 352-357.

Öhman, A., & Mineka, S. (2001). Fears, phobias, and preparedness: Toward an evolved module of fear and fear learning. *Psychological Review*, *108*(3), 483-522.

Pearson, D. G., Deeprose, C., Wallace-Hadrill, S. M. A., Heyes, S. B., & Holmes, E. A. (2013). Assessing mental imagery in clinical psychology: A review of imagery measures and a guiding framework. *Clinical Psychology Review*, *33*(1), 1-23.

Pearson, J., Naselaris, T., Holmes, E. A., & Kosslyn, S. M. (2015). Mental imagery: Functional mechanisms and clinical applications. *Trends in Cognitive Sciences*, *19*(10), 590-602.

Perls, F. S. (1973). *The Gestalt approach and eye-witness to therapy*. New York, NY: Bantam Books.

Prochaska, J. O., & DiClemente, C. C. (1983). Stages and processes of self-change of smoking: Toward an integrative model of change. *Journal of Consulting and Clinical Psychology, 51*, 390-395.

Prochaska, J. O., & DiClemente, C. C. (1986). Toward a comprehensive model of change. In W. R. Miller & N. Heather (Eds.), *Treating addictive behaviors: Processes of change* (pp. 3-27). New York, NY: Plenum Press.

Raabe, S., Ehring, T., Marquenie, L., Olff, M., & Kindt, M. (2015). Imagery rescripting as stand-alone treatment for posttraumatic stress disorder related to childhood abuse. *Journal of Behavior Therapy and Experimental Psychiatry*, *48*, 170-176.

Rachman, S. (1980). Emotional processing. *Behaviour Research and Therapy, 18*, 51-60.

Reimer, S. G., & Moscovitch, D. A. (2015). The impact of imagery rescripting on memory appraisals and core beliefs in social anxiety disorder. *Behaviour Research and Therapy*, *75*, 48-59.

Reisberg, D., Pearson, D. G., & Kosslyn, S. M. (2003). Intuitions and introspections about imagery: The role of imagery experience in shaping an investigator's theoretical views. *Applied Cognitive Psychology, 17*(2), 147-160.

Rescorla, R. A. (2001). Experimental extinction. In R. R. Mowrer & S. B. Klein (Eds.), *Handbook of Contemporary Learning Theories* (pp. 119-154). Mahwah, NJ: Erlbaum.

Richards, D., & Lovell, K. (1999). Behavioural and cognitive behavioural interventions in the treatment of PTSD. In W. Yule (Ed.), *Post-traumatic stress disorders: Concepts and therapy* (pp. 239-266). Chichester: Wiley.

Roediger, H. L. (1990). Implicit memory: retention without remembering. *American Psychologist, 45*(9), 1043-1056.

Roediger, H. L., & McDermott, K. B. (1993). Implicit memory in normal human subjects. *Handbook of Neuropsychology, 8*, 63-63.

Rusch, M. D., Grunert, B. K., Mendelsohn, R. A., & Smucker, M. R. (2000). Imagery rescripting for recurrent, distressing images. *Cognitive and Behavioral Practice*, *7*(2), 173-182.

Salter, C. (2014). Imagery Re-Scripting for PTSD: Session Content and its Relation to Symptom Improvement (Unpublished doctoral dissertation). Royal Holloway, University of London: London.

Schacter, D. L., Addis, D. R., & Buckner, R. L. (2007). Remembering the past to imagine the future: The prospective brain. *Nature Reviews Neuroscience, 8*(9), 657-661.

Schauer, M., & Elbert, T. (2010). Dissociation following traumatic stress etiology and treatment. *Zeitschrift für Psychologie - Journal of Psychology, 218,* 109-127.

Schiller, D., Monfils, M.-H., Raio, C. M., Johnson, D. C., LeDoux, J. E., & Phelps, E. A. (2010). Preventing the return of fear in humans using reconsolidation update mechanisms. *Nature*, *463*(7277), 49-53.

Schiller, D., & Phelps, E. A. (2011). Does reconsolidation occur in humans. *Frontiers in Behavioral Neuroscience*, *5*(24), 1-12.

Seebauer, L., Frob, S., Dubaschny, L., Schonberger, M., & Jacob, G. A. (2014). Is it dangerous to fantasize revenge in imagery exercises? An experimental study. *Journal of Behavior Therapy and Experimental Psychiatry*, *45*(1), 20-25.

Segal, S., & Fusella, V. (1969). Effects of imaging on signal-to-noise ratio, with varying signal conditions. *British Journal of Psychology*, *60*(4), 459-464.

Smith, J. A., Flowers, P., & Osborn, M. (1997). Interpretative phenomenological analysis and the psychology of health and illness. In L. Yardley (Ed.), *Material discourses of health and illness* (pp. 68–91). London: Routledge.

Smucker, M. R. (1997). Post traumatic stress disorder. In R. L. Leahy (Ed.), *Practicing cognitive therapy* (pp. 193–220). Northvale, NJ: Jason Aronson.

Smucker, M. R., & Dancu, C. (2005). *Cognitive-behavioural treatment for adult survivors of childhood trauma: Imagery rescripting and reprocessing*. Lanham, MD: Rowman & Littlefield.

Smucker, M. R., Dancu, C., Foa, E. B., & Niederee, J. L. (1995). Imagery rescripting: A new treatment for survivors of childhood sexual abuse suffering from posttraumatic stress. *Journal of Cognitive Psychotherapy*, *9*(1), 3-17.

Smucker, M., & Niederee, J. (1995). Treating incest-related PTSD and pathogenic schemas through imaginal exposure and rescripting. *Cognitive and Behavioral Practice, 2*(1), 63-92.

Spitzer, C., Barnow, S., Freyberger, H. J., & Grabe, H. J. (2006). Recent developments in the theory of dissociation. *World Psychiatry, 5*(2), 82-86.

Squire, L. R., & Alvarez, P. (1995). Retrograde amnesia and memory consolidation: A neurobiological perspective. *Current opinion in neurobiology, 5*(2), 169-177.

Squire, L. R., & Davis, H. P. (1981). The pharmacology of memory: A neurobiological perspective. *Annual Review of Pharmacology and Toxicology, 21*(1), 323-356.

Stopa, L., & Jenkins, A. (2007). Images of the self in social anxiety: Effects on the retrieval of autobiographical memories. *Journal of Behavior Therapy and Experimental Psychiatry*, *38*(4), 459-473.

Strauss, A., & Corbin, J. (1990). *Basics of qualitative research: Grounded theory procedures and techniques*. Newbury Park, CA: Sage Publications.

Strauss, A., & Corbin, J. (1998). *Basics of qualitative research: Grounded theory procedures and techniques* (2nd ed.). Thousand Oaks, CA: Sage Publications.

Stuart, A. D. P., Holmes, E. A., & Brewin, C. R. (2006). The influence of a visuospatial grounding task on intrusive images of a traumatic film. *Behaviour Research and Therapy*, *44*(4), 611-619.

Suzuki, A., Josselyn, S. A., Frankland, P. W., Masushige, S., Silva, A. J., & Kida, S. (2004). Memory reconsolidation and extinction have distinct temporal and biochemical signatures. *The Journal of Neuroscience, 24*(20), 4787-4795.

Teasdale, J. D. (1997a). The relationship between cognition and emotion: The mind-in-place in mood disorders. In D. M. Clark & C. G. Fairburn (Eds.), *The science and practice of cognitive behaviour therapy* (pp. 67–93). Oxford: Oxford University Press.

Teasdale, J. D. (1997b).The transformation of meaning: The interacting cognitive subsystems approach. In M. Power & C. R. Brewin (Eds.), *Meaning in psychological therapies: Integrating theory and practice* (pp. 141–156). New York, NY: Wiley.

Teasdale, J. D., & Barnard, P. J. (1993). *Affect, cognition and change: Remodelling depressive thought*. Hove: Lawrence Erlbaum.

ten Napel-Schutz, M. C., Abma, T. A., Bamelis, L., & Arntz, A. (2011). Personality disorder patients' perspectives on the introduction of imagery within schema therapy: A qualitative study of patients' experiences. *Cognitive and Behavioral Practice, 18*(4), 482-490.

Tronson, N. C., & Taylor, J. R. (2007). Molecular mechanisms of memory reconsolidation. *Nature Reviews Neuroscience*, *8*(4), 262-275.

Tversky, A., & Kahneman, D. (1973). Availability: A heuristic for judging frequency and probability. *Cognitive Psychology*, *5*(2), 207-232.

Veale, D., Page, N., Woodward, E., & Salkovskis, P. (2015). Imagery rescripting for obsessive compulsive disorder: A single case experimental design in 12 cases. *Journal of Behavior Therapy and Experimental Psychiatry*, *49*, 230-236.

Watson, J. B., & Rayner, R. (1920). Conditioned emotional reactions. *Journal of Experimental Psychology, 3*(1), 1-14.

Weertman, A., & Arntz, A. (2007). Effectiveness of treatment of childhood memories in cognitive therapy for personality disorders: A controlled study contrasting methods focusing on the present and methods focusing on childhood memories. *Behaviour Research and Therapy*, *45*(9), 2133-2143.

Wells, A. (2000). *Emotional Disorders and Metacognition: Innovative cognitive therapy*. Chichester: John Wiley and Sons.

Wells, A., & Sembi, S. (2004). Metacognitive therapy for PTSD: A preliminary investigation of a new brief treatment. *Journal of Behavior Therapy and Experimental Psychiatry*, *35*(4), 307-318.

Wheatley, J., Brewin, C. R., Patel, T., Hackmann, A., Wells, A., Fisher, P., & Myers, S. (2007). 'I'll believe it when I can see it': Imagery rescripting of intrusive sensory memories in depression. *Journal of Behavior Therapy and Experimental Psychiatry*, *38*(4), 371-385.

Wheatley, J., & Hackmann, A. (2011). Using imagery rescripting to treat major depression: Theory and practice. *Cognitive and Behavioral Practice*, *18*(4), 444-453.

Wiener, C. L. (2007). Making teams work in conducting grounded theory. In A. Bryant & K. Charmaz (Eds.), *Handbook of grounded theory* (pp. 293-310). London: Sage Publications.

Wild, J., Hackmann, A., & Clark, D. M. (2007). When the present visits the past: Updating traumatic memories in social phobia. *Journal of Behavior Therapy and Experimental Psychiatry*, *38*(4), 386-401.

Wild, J., Hackmann, A., & Clark, D. M. (2008). Rescripting early memories linked to negative images in social phobia: A pilot study. *Behavior Therapy*, *39*(1), 47-56.

Willig, C. (2001). Grounded theory. In C. Willig (Ed.), *Introducing qualitative research in psychology: Adventures in theory and method* (pp. 32-48). Buckingham: Open University Press.

Wolpe, J. (1958). *Psychotherapy by reciprocal inhibition*. Stanford, CA: Stanford University Press.

Wolpe, J. (1995). Reciprocal inhibition: Major agent of behavior change. In W. O'Donohue & L. Krasner (Eds.), *Theories of behavior therapy: Exploring behavior change* (pp. 23-57). Washington, DC: American Psychological Association.

Young, J. E., Klosko, J. S., & Weishaar, M. E. (2003). *Schema therapy: A practitioner's guide*. New York, NY: Guilford Press.

Appendices

Appendix 1. Ethical approval from NHS Research Ethics Committee (REC): Favourable opinion with conditions.

NHS
Health Research Authority
National Research Ethics Service

North West - Preston Research Ethics Committee
Barlow House
3rd Floor
4 Minshull Street
Manchester
M1 3DZ

Telephone: 01616257818
Fax:

29 September 2015

Ms Zoe Chessell
Department of Clinical Psychology, John Bowyer Building
Royal Holloway, University of London
Egham Hill, Egham, Surrey
TW20 0EX

Dear Ms Chessell

Study title:	**Imagery Rescripting (ImRs): Mechanisms of Action in Treatment for Post Traumatic Stress Disorder (PTSD)**
REC reference:	**15/NW/0796**
Protocol number:	**N/A**
IRAS project ID:	**184367**

The Proportionate Review Sub-committee of the North West - Preston Research Ethics Committee reviewed the above application on 25 September 2015.

We plan to publish your research summary wording for the above study on the HRA website, together with your contact details. Publication will be no earlier than three months from the date of this favourable opinion letter. The expectation is that this information will be published for all studies that receive an ethical opinion but should you wish to provide a substitute contact point, wish to make a request to defer, or require further information, please contact the REC Manager Mrs Carol Ebenezer, nrescommittee.northwest-preston@nhs.net. Under very limited circumstances (e.g. for student research which has received an unfavourable opinion), it may be possible to grant an exemption to the publication of the study.

Ethical opinion

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.

Conditions of the favourable opinion

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

study.

a. The Committee would like to see the Participant Information Sheet revised to
   i) Include a contact point with telephone number for complaints for someone independent of the research team e.g. PALS or equivalent
   ii) Make the question headings bold
b. The Committee would like to see the Consent Form revised to
   i) Include the regulatory clause "I understand that data collected from the study may be looked at by regulatory authorities or by persons from the Trust where it is relevant to my taking part in this research. I give permission for these individuals to have access to this information"
   ii) Include a line for the signature of the person taking consent.

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.

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.

Registration of Clinical Trials

All clinical trials (defined as the first four categories on the IRAS filter page) must be registered on a publically accessible database. This should be before the first participant is recruited but no later than 6 weeks after recruitment of the first participant.

There is no requirement to separately notify the REC but you should do so at the earliest opportunity e.g. when submitting an amendment. We will audit the registration details as part of the annual progress reporting process.

To ensure transparency in research, we strongly recommend that all research is registered but for non-clinical trials this is not currently mandatory.

If a sponsor wishes to request a deferral for study registration within the required timeframe, they should contact hra.studyregistration@nhs.net. The expectation is that all clinical trials will

be registered, however, in exceptional circumstances non registration may be permissible with prior agreement from the HRA. Guidance on where to register is provided on the HRA website.

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).

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").

The members had no ethical issues with this application but requested minor changes to the Participant Information Sheet and Consent Form as described in the decision above.

Approved documents

The documents reviewed and approved were:

Document	*Version*	*Date*
Evidence of Sponsor insurance or indemnity (non NHS Sponsors only) [2015 - 2016 RSA Professional Indemnity TWIMC letter, Version One, 18.09.15]	One	18 September 2015
GP/consultant information sheets or letters [Letter to participant's GP, Version One, 18.09.15]	One	18 September 2015
Interview schedules or topic guides for participants [part of response to critique]		18 September 2015
Other [Information about participants, Version One, 18.09.15]	One	18 September 2015
[redacted]	One	18 September 2015
REC Application Form [REC_Form_21092015]		21 September 2015
Referee's report or other scientific critique report [Provisional Approval Granted, Version One, 18.09.15]	One	18 September 2015
Referee's report or other scientific critique report [Responses to Provisional Approval, Version One, 18.09.15]	One	18 September 2015
Referee's report or other scientific critique report [Full Approval Granted, Version One, 18.09.15]	One	18 September 2015
Research protocol or project proposal [Study Protocol, Version One, 18.09.15]	One	18 September 2015
Summary CV for Chief Investigator (CI) [Zoe Chessell's CV, Version One, 18.09.15]	One	18 September 2015
Summary CV for supervisor (student research) [Gary Brown's Short CV, Version One, 18.09.15]	One	18 September 2015

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

User Feedback

The Health Research Authority is continually striving to provide a high quality service to all applicants and sponsors. You are invited to give your view of the service you have received and the application procedure. If you wish to make your views known please use the feedback form available on the HRA website: http://www.hra.nhs.uk/about-the-hra/governance/quality-assurance/

HRA Training

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

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

15/NW/0796	**Please quote this number on all correspondence**

Yours sincerely

pp.

Dr Patricia Wilkinson
Chair

Email: nrescommittee.northwest-preston@nhs.net

Enclosures: *List of names and professions of members who took part in the review*

"After ethical review – guidance for researchers"

Copy to: *Ms Sharon Clutterbuck*

[redacted]

Appendix 2. Ethical approval from NHS REC: Full approval granted.

NHS
Health Research Authority
National Research Ethics Service

North West - Preston Research Ethics Committee
Barlow House
3rd Floor
4 Minshull Street
Manchester
M1 3DZ

Telephone: 01616257818
Fax:

05 October 2015

Ms Zoe Chessell
Department of Clinical Psychology, John Bowyer Building
Royal Holloway, University of London
Egham Hill, Egham, Surrey
TW20 0EX

Dear Ms Chessell

Study title: **Imagery Rescripting (ImRs): Mechanisms of Action in Treatment for Post Traumatic Stress Disorder (PTSD)**
REC reference: **15/NW/0796**
Protocol number: **N/A**
IRAS project ID: **184367**

Thank you for your response. I can confirm the REC has received the documents listed below and that these comply with the approval conditions detailed in our letter dated 29 September 2015

Documents received

The documents received were as follows:

Approved documents

The final list of approved documentation for the study is therefore as follows:

Document	*Version*	*Date*
Evidence of Sponsor insurance or indemnity (non NHS Sponsors only) [2015 - 2016 RSA Professional Indemnity TWIMC letter, Version One, 18.09.15]	One	18 September 2015
GP/consultant information sheets or letters [Letter to participant's GP, Version One, 18.09.15]	One	18 September 2015
Interview schedules or topic guides for participants [part of response to critique]		18 September 2015
Other [Information about participants, Version One, 18.09.15]	One	18 September 2015

[redacted]	One	18 September 2015
Participant consent form [Consent Form for participants, Version Two, 02.10.15]	Two	02 October 2015
Participant information sheet (PIS) [Information sheet for participants, Version Two, 02.10.15]	Two	02 October 2015
REC Application Form [REC_Form_21092015]		21 September 2015
Referee's report or other scientific critique report [Provisional Approval Granted, Version One, 18.09.15]	One	18 September 2015
Referee's report or other scientific critique report [Responses to Provisional Approval, Version One, 18.09.15]	One	18 September 2015
Referee's report or other scientific critique report [Full Approval Granted, Version One, 18.09.15]	One	18 September 2015
Research protocol or project proposal [Study Protocol, Version One, 18.09.15]	One	18 September 2015
Summary CV for Chief Investigator (CI) [Zoe Chessell's CV, Version One, 18.09.15]	One	18 September 2015
Summary CV for supervisor (student research) [Gary Brown's Short CV, Version One, 18.09.15]	One	18 September 2015

You should ensure that the sponsor has a copy of the final documentation for the study. It is the sponsor's responsibility to ensure that the documentation is made available to R&D offices at all participating sites.

15/NW/0796 **Please quote this number on all correspondence**

Yours sincerely

Carol Ebenezer
REC Manager

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

Copy to: *Ms Zoe Chessell*
Ms Sharon Clutterbuck
[redacted]

Appendix 3. Ethical approval from the local Research and Development department: Full approval granted.

[redacted]

[redacted]

Ms Zoe Chessell
Department of Clinical Psychology
Royal Holloway, University of London
John Bowyer Building
Egham Hill
Surrey TW20 0EX

18 November 2015

Dear Ms Chessell,

Research Title:	**Imagery Rescripting (ImRs): Mechanisms of Action in Treatment for Post Traumatic Stress Disorder (PTSD)**
Principal Investigator:	**Ms Zoe Chessell**
Project reference:	**PF639**
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) (eg. 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 [redacted] 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.

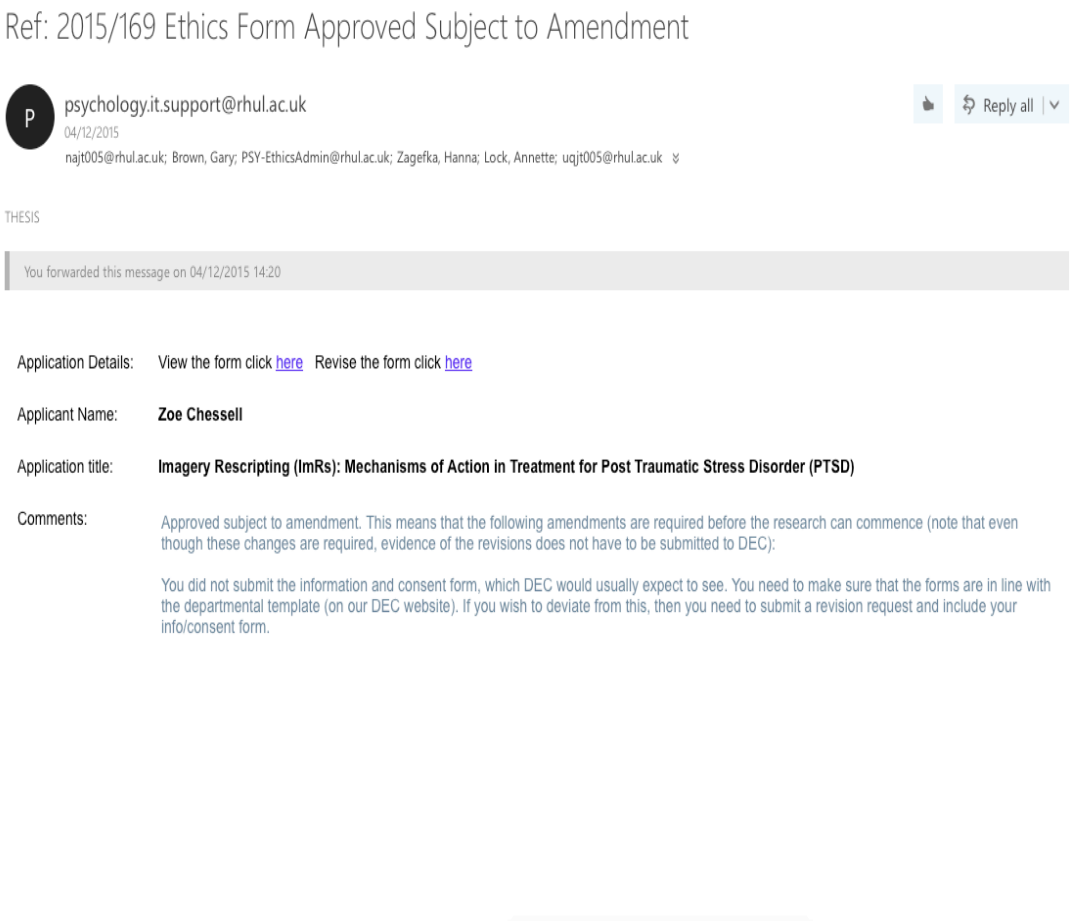
Please note, however, that this list is by no means exhaustive and remains subject to change in response to new relevant statutory policy and guidance. If you have any queries regarding [redacted]

Yours sincerely,

[redacted]

Research & Development Director
On behalf of the Research & Development Committee.

Appendix 4. Ethical approval from Royal Holloway University of London: Full approval granted subject to amendment.



Ref: 2015/169 Ethics Form Approved Subject to Amendment

P psychology.it.support@rhul.ac.uk

04/12/2015

najt005@rhul.ac.uk; Brown, Gary; PSY-EthicsAdmin@rhul.ac.uk; Zagefka, Hanna; Lock, Annette; uqjt005@rhul.ac.uk

Reply all

THESIS

You forwarded this message on 04/12/2015 14:20

Application Details:	View the form click here Revise the form click here
Applicant Name:	**Zoe Chessell**
Application title:	**Imagery Rescripting (ImRs): Mechanisms of Action in Treatment for Post Traumatic Stress Disorder (PTSD)**
Comments:	Approved subject to amendment. This means that the following amendments are required before the research can commence (note that even though these changes are required, evidence of the revisions does not have to be submitted to DEC): You did not submit the information and consent form, which DEC would usually expect to see. You need to make sure that the forms are in line with the departmental template (on our DEC website). If you wish to deviate from this, then you need to submit a revision request and include your info/consent form.

Appendix 5. Information sheet for participants.

[redacted]

Department of Psychology
Royal Holloway, University of London, Egham, Surrey TW20 0EX, UK

Information Sheet

Imagery Rescripting (ImRs): Mechanisms of Action in Treatment for Post Traumatic Stress Disorder (PTSD)

My name is Zoe Chessell and I am a trainee Clinical Psychologist at Royal Holloway, University of London. I am carrying out research exploring peoples' experience of a type of treatment for Post Traumatic Stress Disorder (PTSD) called Imagery Rescripting (ImRs). The study is part of my training in clinical psychology and is being supervised by Dr Gary Brown (Senior Lecturer at Royal Holloway, University of London) and [redacted] We would like to invite you to participate in this research project but before you decide it is important to understand why the research is being carried out and what your participation will involve.

What is the purpose of the study?

The purpose is to gain an understanding of peoples' experience of ImRs as part of their treatment for PTSD and why they think it is a helpful, or unhelpful, technique. A model will then be developed that aims to explain the 'mechanisms of action' of ImRs - why the technique works or does not work when treating PTSD. It is hoped that this will increase understanding of ImRs and help clinicians to use it in the most effective way.

Why have I been asked to take part?

We are inviting around 8-12 people to take part for whom ImRs (a minimum of one session) has been part of their treatment for PTSD at T[redacted] People will either still be being seen at the [redacted]

What will the study involve?

With your consent a clinician from the [redacted] has given me your details and I have rung to speak to you and then sent you this information sheet. I will call you again within a few days and if you would like to take part we will arrange a time to meet for an interview at the [redacted] The interview will last approximately 90 minutes and I will ask you questions about your experiences of ImRs in your treatment for PTSD and what you think made it a helpful or unhelpful technique. The interview will be recorded on a digital audio recorder, to enable the interview to be analysed. If you would not be travelling to t[redacted] on this day anyway you will receive compensation for your travel costs. We would also like to inform your General Practitioner that you are taking part in the research. **You are under no obligation to take part in the interview at any time.**

If you would like to there is the option for me to contact you at a later date to send you the theory developed through these interviews to receive your feedback. I will send this by email and you can either email me or we can speak on the phone regarding this. **You are under no obligation to take part in this part of the study.**

What are the possible risks and benefits of taking part?

Risks: During the interview you might be asked questions which result in you talking about the traumatic event that occurred, which could be distressing for some people. You can stop the interview at any time, choose not to answer any questions, and there will be time at the end of the interview to discuss how you are feeling. If necessary I will ensure to put you in touch with appropriate support.

Benefits: You may find it positive to have time to think about your treatment for PTSD. Your involvement may also give you satisfaction knowing that you have contributed to research that will increase understanding of ImRs and therefore potentially improve the future effectiveness of treatment for PTSD.

What if you are concerned about my responses?
If the information discussed during the interview suggests that you are experiencing emotional distress, I will suggest you speak to a clinician at the [redacted] or your GP. If the information discussed during the interview suggests that you are at risk of harming yourself or others then I have to discuss this with a clinician at the [redacted] nd your GP and/or other appropriate services.

Who will have access to my information?
The interview will be typed up and stored securely and confidentially and the audio recording will be deleted. Only my supervisors and myself will have access to the interviews.

I will ask your consent for your clinician to provide me with the following information: your gender, your date of birth, your ethnicity, how many sessions of ImRs you completed, how long it has been since your last session of ImRs, if you have experienced single or multiple traumas, how many of these have resulted in PTSD symptoms, the time since the trauma occurred, if you have had any previous psychological treatment for PTSD and if your clinician was a qualified or trainee psychologist. I will also ask for your scores on questionnaires you completed throughout your treatment. **It is ok to say you would not like parts/all of this information to be shared.**

The research will be written up as a thesis, as part of my doctorate in Clinical Psychology, and potentially published in a scientific journal. **Quotes from the interviews and the information you and your clinician provided me with will be used however no identifiable information will ever be used – you will always be anonymous.** The study data will be stored securely at Royal Holloway University for a maximum of five years after publication in a scientific journal and then be securely destroyed.

Do I have to take part?
You do not have to take part in this study and you can also take part but not answer every question. If you decide to take part **you may withdraw at any time without having to give a reason. Your decision about whether to take part will not affect your access to services now or in the future.**

What should I do if I would like to find out more?
I will call you again within a few days to ask if you would like to take part and you can ask me questions then. If you would like to discuss any aspect of the research with my supervisors you can contact them by email: Dr Gary Brown at Gary.Brown@rhul.ac.uk and/or [redacted]

What if I want to make a complaint?
If you would like a make a complaint about the research please do contact the Patient Advice and Liaison Services (PALS) [redacted] They are separate from the research team.

Can I know the results?
If you would like to be sent a summary of the results by post following completion of the study in July 2016 please let me know at the time of the interview and indicate this on the consent form.

Please keep this information for reference. Please feel free to ask any questions before you complete the consent form, which we will do before the interview. This study has been reviewed and approved by the Psychology Department internal ethics committee at Royal Holloway, University of London and by the NHS ethics committee. **Thank you for taking the time to read this information.**

Appendix 6. Extracts from research diary and memos.

Research diary extracts

15th and 16th of December 2015:

I just attended a two-day training on ImRs with Arnoud Arntz with my team on placement. It was a really interesting two days, I feel lucky to have been there. It has made me more enthusiastic about the thesis and finding out more about the technique. However, I'm concerned now about how this knowledge could affect my thinking at all stages of the study: creating the interview schedule, during the interviews and at the coding stage. The amount of prior knowledge I have is quite different to Glaser and Strauss' (1967) original ideas of how to conduct a GT study. My research supervisor suggested I read some of Harper's (2013) thoughts on this, particularly 'concerns about the role of theory'. Harper suggested that if a researcher's reading around an area is narrow there is the danger that analysis will be superficial. He suggested the important thing is to identify assumptions and trace the effects of these on the data. This was reassuring in regards to the idea of comparing the results to existing theories. Still, I should keep this in mind throughout the process and continue to discuss this in research supervision. How can I make sure I do not focus on these theories over other ideas? What are the best ways to guard against this influencing the results – reflect, make diary entries, re-check codes myself, cross-check codes with others?

29th of January 2016:

I completed the first interview with P1 today. It feels great to have finally started the interviews and it was reassuring the interview schedule felt appropriate – length, type of questions and the questions making sense. I am worried though that sometimes P1 seemed to be answering about TF-CBT more generally and not specifically about ImRs. This made me wonder if it is really possible to separate the two, particularly regarding what has created memory change? Perhaps a limitation of the study then is the confound that comes with all participants having undergone TF-CBT treatment before ImRs. Should future research replicate this study with those who have had only ImRs (like Arntz et al., 2013)? Would this demonstrate similar or different findings?

Something else that I'm left thinking about is P1 feeling they needed to protect the rescript – I had not considered this before. Can rescripted images become 'detached' from the memory being rescripted and become more of a compassionate/nurturing figure? This could have many positives (being used more generally to alleviate distress and feel soothed) but also negatives too (the image develops feelings and then needs to be looked after rather than looking after the person in the memory). Explore this further with future participants?

Also, this interview has made me consider the terminology I'm using more carefully. Interestingly, P1 viewed 'rescripting' as cognitive restructuring/updating techniques as well, which makes sense, and we had an interesting conversation about 'knowledge rescripting' and 'imagery rescripting'. After all, 'rescripting' is a term created and used by therapists and I realised that I had been narrowly viewing 'rescripting' as ImRs only. I need to consider this carefully in future interviews, perhaps a clearer

definition of 'imagery rescripting' is needed? My research supervisor suggested to guard against being too prescriptive, but will people be left confused?

Possible future areas to explore: Should questions regarding believability of the rescript be emphasised? Should questions regarding protecting the rescript be included? Should questions regarding effect on mood if cannot bring rescript to mind be included?

Later note: Feedback on the interview suggested that a clearer definition of ImRs would be helpful. I had been ensuring this was clear at the beginning of the interviews since interviewing P1, however I will continue to make this clear. I do not feel that participants have been confused regarding what I am asking about however, so hopefully not detrimental to the results.

18th of February 2016:

I have just completed the interview with P3 and I continue to be struck by how emotive the interviews are turning out to be. P3 showed me various physical health issues due to the traumatic event and I am feeling quite emotional. I think I need to make it even clearer that I'm asking about the technique not the traumatic event itself and reiterate that we can complete the interview without participants telling me about the trauma. Is this possible for people though? I should also continue to reiterate that they can stop at any time, not answer any questions, and speak with therapists afterwards if necessary. I need to ensure I'm not falling into a clinical rather than a research role during the interviews, particularly when participants are distressed. These role boundaries can feel difficult to hold.

Transcribing this interview (same day): I need to be careful of the language I'm using when discussing what happens to the original traumatic memory representation. It is easy when thinking quickly in the interviews to use leading questions referring to "two memories" or "changing the memory", for example, "do you think that that's replaced, so the original memory has changed and been replaced a little bit or does it feel like there are two memories, the different ending and the old memory?" (P3, line 519). This may be where my prior knowledge of theory is coming in to the interviews and I need to be careful of this.

20th of March 2016 (changes to the interview schedule):

Many participants are speaking of it feeling like there are two memories. However the original memory does feel less bad – is this due to rescripting though? Should we change the interview schedule to reflect this? For example, if participants do talk about two memories I could ask "when you are reminded of the traumatic event, which memory is stronger, the original or the rescripted?" It is difficult to ask questions to clearly ascertain underlying theories of memory however. Also it is interesting that the question "has there been a change in meaning of the original event for you?" is confusing for people/they do not like this question. Perhaps meaning is encapsulated in emotion change for participants generally – emotional meaning? I should talk to my research supervisors about removing this question as it does not add anything.

Memo extracts

25th of February 2016: Raising initial codes to focused codes - Is practice needed?

It strikes me that some participants are able to use rescripting outside of sessions to: 1) rehearse the rescript and even 2) rescript new/change existing rescripts, both of which are increasing the effectiveness of ImRs. However some participants have been very clear they are unable to do this alone. It appears that practising rescripting outside of sessions (in various ways) increases effectiveness. So this raises the question, what are the factors that increase or decrease the likelihood of someone practising? Confidence, belief in ability (self-efficacy?), reliance on the therapist, previous successes, therapist's instructions, nature of the trauma? Rehearsing the rescripts is perhaps less of a surprising finding that people actually rescripting autonomously outside of sessions. Is there research on rescripting autonomously? This makes me think of the saying "give a man a fish and you feed him for a day, teach a man to fish and you feed him for a lifetime". This fits with the CBT idea of homework. Could a rescripting diary be used? People could practise the one created in sessions, record, discuss, try again. Or even rescript something new. Is this advisable without the therapist there? Conversely, how does this fit with the idea that ImRs can make a powerful change to memories within one session? Has research ever examined the effects of practice on ImRs longitudinally?

These ideas seem to be coming up within interviews and across interviews. Perhaps possible focused codes to be raised therefore are - 'rehearsing the rescript' and 'developing rescripting skills'?

11th of March 2016: Theoretical codes – Memory change mechanism of action

Change to memory representations definitely feels like a theoretical code - it is central to peoples' experiences, creates change in the process, and aids theoretical consideration. However, I have been thinking a lot whether the underlying mechanisms of memory change can actually be delineated in this study. I had an interesting conversation today with another trainee doing research in the same area about this. If a new memory had been created or if the old memory had been reconsolidated participants are likely to still be able to retrieve the old memory (Arntz, 2012). What would multiple trace theory say about this?

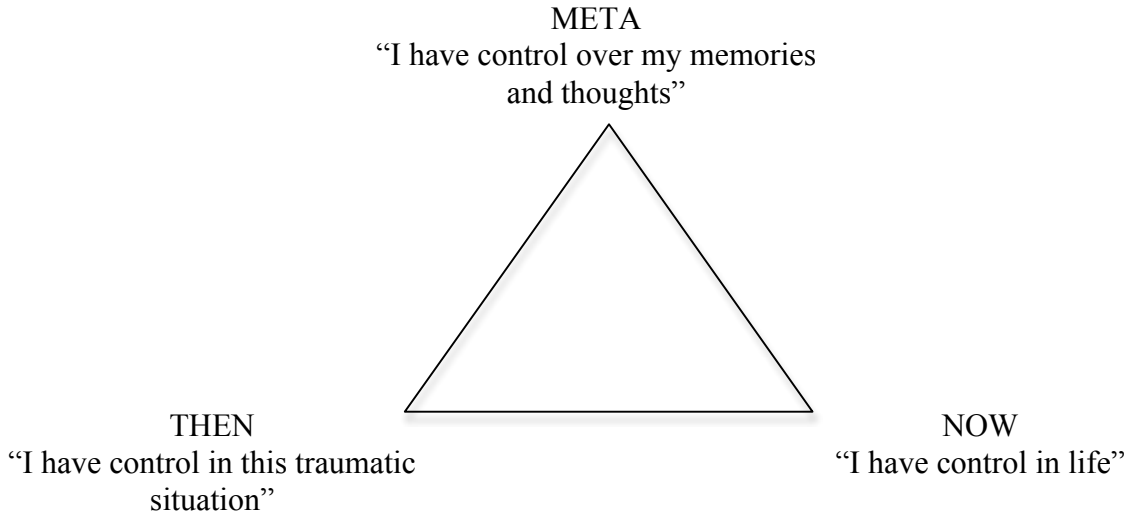
So, I need to stick closely to participants' experiences. Many participants feel as if there are two competing memories, which feels more in line with Brewin's ideas, although I must remember it is not necessarily evidence for this. P5 definitely described a change to the original memory/rewriting/a part had gone/creating a new storyline, which felt like a different experience. It's also easy to assume if a rescript comes automatically with the memory, the memory has been changed. However this could just be a consistently more automatic rescript? Could two memories become merged over time?

Therefore, I think a theoretical code should address memory change and within that there should be a focused code about change to the original memory and one about creating a new memory to capture participants' experiences.

8th of April 2016: Raising initial codes to focused codes – Metacognition?

An idea that felt important in research supervision today was metacognition. This has been discussed in the interviews but is perhaps harder to 'spot' as participants are not explicit about this, a new sense of control over memories just comes through how they describe things. I need to be more alert to this and raise this as a focused code if the data supports it?

An interesting idea discussed in supervision was the different levels of metacognition. Is it possible that metacognitively gaining control over the memories is linked to gaining control in the rescript itself and linked to gaining control in life more generally? I wonder if this has/will come through more in future interviews? The time constraints placed on the study make me concerned codes would occur if there was more time to saturate the categories fully. I will report what is evident from the interviews conducted and mention this in the discussion.



Appendix 7. Initial interview schedule.

Interview Schedule Draft

Introduction

- Introduction

"This interview is about the technique of imagery rescripting and how it might work and not about the traumatic event itself, so the success of the interview does not depend on me knowing about the trauma, so you do not need to disclose anything about this if you do not want to. However if you feel you would like to share this with me as we go through the interview you can, but it is not necessary."

- Confidentiality

- Limits

- Consent form

- Discuss
- Both sign

- Any questions?

Preamble

- *"Throughout this interview I will be asking you questions about a specific part of your treatment for post-traumatic stress disorder called imagery rescripting. This is the part of your therapy where you changed and rewrote the memory by imagining ways to make it turn out differently and/or feel less upsetting."*
- *"Did you have a name for this part? Or shall we call it imagery rescripting?"* (Use participant's language throughout).

1

Experience of Imagery Rescripting

1) **If you wanted to describe the imagery rescripting technique to someone who was about to go through it, what would you say to them?**

PROMPTS:

- Can you tell me more about that?

2) **Please take a moment to think about your experience of the imagery rescripting technique. Could you describe for me the different steps/stages of imagery rescripting in the order that you experienced them?**

PROMPTS:

- The introduction/rationale
- Getting started
- Deciding what to re-script
- The process
- Putting it into practice (e.g. using the image outside of sessions)
- Therapeutic relationship
- Contrast to previous therapeutic techniques (psycho-education, reliving, experiments).

3) **Did you find imagery rescripting to be beneficial? If so, what felt like the most beneficial part for you?**

PROMPTS:

- What made this feel beneficial?

4) **Did you find imagery rescripting challenging? If so, what felt like the most challenging part for you?**

PROMPTS:

- What made this feel challenging?
- Was it possible to overcome this challenge?

Mechanisms of Action of Imagery Rescripting

5) If you were to explain to someone how imagery rescripting works - what accounts for any effect it has - in your own words, what would you say?

PROMPTS:
- Can you tell me more about that?
- How did you think it had that effect?
- Did rescripting one memory have an effect on any other memories?

Memory

"Many people currently experiencing PTSD describe the memory of the trauma coming back to them unpredictably. For example, unexpectedly during the day, or in nightmares when they are asleep, and/or in flashbacks."
- Make sure participants are familiar with the term flashbacks and if not *"which is when it feels like the traumatic event is happening again in the here and now".*
- *"Remember you don't have to tell me about the traumatic memory if you don't want to."*

6) What was your experience of the traumatic memory coming back to you in this way before imagery rescripting? Do you ever still experience the original traumatic memory now? If so, how?

7) Do you still recall the original traumatic memory in the same way as before imagery rescripting or in a different way (naturalistically)?

PROMPTS:
- (If the original traumatic memory is not naturally recalled) Are you able to recall it with effort?

8) Does it feel like the original traumatic memory is still present but you think of the rescripted memory instead? How easy/hard is that to do? Is this a choice?

9) Does it feel like the original traumatic memory has been partly or fully replaced by the rescripted memory?

Thoughts and Feelings

"As well as changes in memory, another outcome of treatment for PTSD can be changes in the way people think and in the way they feel."

13) Have you noticed any changes in your thoughts and feelings (self/others/the world) due to imagery rescripting? If so, in what way have they changed?

14) Has there been a change in meaning of the original traumatic event for you? If so, what has the meaning changed from and to?

15) Did imagery rescripting address any (emotional) needs that you felt were not addressed at the time of the trauma? If so, could you tell more about this?

Process of Imagery Rescripting

16) Do you remember how you and your therapist decided what to rescript? Was this approach to deciding helpful? Were there any aspects that were unhelpful?

PROMPTS:

- Do you remember if it was you or your therapist that led the rescripting process? Did … feel helpful? Did … feel unhelpful in any way?
- Do you remember if your therapist acted as a supportive/reassuring presence within the actual rescript? Did … feel helpful? Did … feel unhelpful in any way?

- Do you remember if you/your therapist chose something realistic or surprising in the rescript? Did … feel helpful? Did … feel unhelpful in any way?
- Do you remember if other people/figures came into the rescript? Did … feel helpful? Did … feel unhelpful in any way?

17) Do you remember at what point in the original trauma memory the rescripted image began (for example, before the traumatic event happened, during the traumatic event or after the traumatic event)? Was … helpful? Was … unhelpful in any way? How did you decide that this point would be the most helpful place?

18) Do you remember the type and level of emotions you experienced during the imagery rescripting? Did it feel helpful to experience … and … level of emotion? Did it feel unhelpful in any way?

PROMPTS:

- Did you feel the same emotions that you felt at the time of the trauma?
- Did you feel new/different emotions (such as mastery and compassion)?
- Did you feel both emotions that you felt at the time of the trauma and new/different emotions?
- Did you experience any dissociation (define for participants)? Did this affect the rescripting process in any way? If so, how?

19) Do you remember how vivid/clear the image in the rescript was? Did it feel helpful for the rescript to be … vivid/clear? Did it feel unhelpful in any way?

20) Do you remember if you viewed the rescript like you were the person in the scenario (field perspective) or as if you were observing the scenario (observer perspective)? Or did you move between the two? Did … feel helpful? Did it feel unhelpful in any way?

Effectiveness of Imagery Rescripting

21) Having completed rescripting what happens now when you are reminded of the event?

PROMPTS:

- What did you find helpful about imagery rescripting in terms of your symptoms of PTSD?
- What did you find helpful about imagery rescripting in terms of your life more generally?

22) If you were telling someone about to start imagery rescripting how to get the most out of the technique so it was a success, what would you say?

Ending Questions

23) Summarise (what I have covered – memory, thoughts and feelings). **Is there anything that we have left out that is important to tell me about how imagery rescripting works? Are you sure?**

"The reason I am talking to you today is to find out about the things that professionals using imagery rescripting might have missed, so it's important to hear if you feel we haven't talked about something significant."

Appendix 8. Adapted interview schedule with changes highlighted in red.

Interview Schedule

Introduction

- Introduction

- "This interview is about the technique of imagery rescripting and how it might work and not about the traumatic event itself, so the success of the interview does not depend on me knowing about the trauma, so you do not need to disclose anything about this if you do not want to. However if you feel you would like to share this with me as we go through the interview you can, but it is not necessary."

- "However for some of the questions it is likely that you may be reminded of the traumatic event. Remember that you do not have to answer any questions and you can stop the interview at any time. If you are feeling distressed how do you think I would know? Is there anything I can do to help ease your distress if this occurs?"

- Confidentiality

- Limits

- Consent form

- Discuss
- Both sign

- Any questions?

Preamble

- "Throughout this interview I will be asking you questions about a specific part of your treatment for post-traumatic stress disorder called imagery rescripting. This is the part of your therapy where you changed and rewrote the memory by imagining ways to make it turn out differently and/or feel less upsetting."

- "Did you have a name for this part, where you rescripted with your imagination? Or shall we call it imagery rescripting?" (Use participant's language throughout).

- "Treatment for PTSD usually starts with conversations about PTSD, for example symptoms and information about traumatic memories. Can you remember talking through this in your sessions? Can you remember what you did next? Next?

1

Experience of Imagery Rescripting

1) **If you wanted to describe the imagery rescripting technique to someone who was about to go through it, what would you say to them?**

PROMPTS:

- Can you tell me more about that?

2) **Please take a moment to think about your experience of the imagery rescripting technique. Could you describe for me the different steps/stages of imagery rescripting in the order that you experienced them?**

PROMPTS:

- The introduction/rationale
- Getting started
- Deciding what to re-script
- The process
- Putting it into practice (e.g. using the image outside of sessions)
- Therapeutic relationship
- Contrast to previous therapeutic techniques (psycho-education, reliving, experiments).

3) **Did you find imagery rescripting to be beneficial? If so, what felt like the most beneficial part for you?**

PROMPTS:

- What made this feel beneficial?

4) **Did you find imagery rescripting challenging? If so, what felt like the most challenging part for you?**

PROMPTS:

- What made this feel challenging?
- Was it possible to overcome this challenge?

Mechanisms of Action of Imagery Rescripting

5) If you were to explain to someone how imagery rescripting works - what accounts for any effect it has - in your own words, what would you say?

PROMPTS:
- Can you tell me more about that?
- How did you think it had that effect?
- Did rescripting one memory have an effect on any other memories?

Memory

- *"Many people currently experiencing PTSD describe the memory of the trauma coming back to them unpredictably. For example, unexpectedly during the day, or in nightmares when they are asleep, and/or in flashbacks."*
- Make sure participants are familiar with the term flashbacks and if not *"which is when it feels like the traumatic event is happening again in the here and now".*
- *"Remember you don't have to tell me about the traumatic memory if you don't want to."*

6) What was your experience of the traumatic memory coming back to you in this way before imagery rescripting? Do you ever still experience the original traumatic memory now? If so, how?

7) Do you still recall the original traumatic memory in the same way as before imagery rescripting or in a different way (naturalistically)?

PROMPTS:
- (If the original traumatic memory is not naturally recalled) Are you able to recall it with effort?

8) Does it feel like the original traumatic memory is still present but you think of the rescripted memory instead? How easy/hard is that to do? Is this a choice?

9) Does it feel like the original traumatic memory has been partly or fully replaced by the rescripted memory?

When you are reminded of the traumatic event, which memory is stronger, the original memory or the rescripted memory?

PROMPTS:

- Which comes to mind first, or do they occur at the same time?
- Are they distinct/separate or do they merge into each other?
- Do you need to "rewind" replay the memory to "get it right"?

Thoughts and Feelings

- *"As well as changes in memory, another outcome of treatment for PTSD can be changes in the way people think and in the way they feel."*

13) Have you noticed any changes in your thoughts and feelings (self/others/the world) due to imagery rescripting? If so, in what way have they changed?

QUESTION 14) REMOVED

15) Did imagery rescripting address any (emotional) needs that you felt were not addressed at the time of the trauma? If so, could you tell more about this?

Process of Imagery Rescripting

16) Do you remember how you and your therapist decided what to rescript?
Was this approach to deciding helpful? Were there any aspects that were unhelpful?

PROMPTS:

- Do you remember if it was you or your therapist that led the rescripting process? Did … feel helpful? Did … feel unhelpful in any way?
- Do you remember if your therapist acted as a supportive/reassuring presence within the actual rescript? Did … feel helpful? Did … feel unhelpful in any way?

- Do you remember if you/your therapist chose something realistic or surprising in the rescript? Did … feel helpful? Did … feel unhelpful in any way? How important was it that the image was something that was realistic or believable?
- Do you remember if other people/figures came into the rescript? Did … feel helpful? Did … feel unhelpful in any way?

17) Do you remember at what point in the original trauma memory the rescripted image began (for example, before the traumatic event happened, during the traumatic event or after the traumatic event)? Was … helpful? Was … unhelpful in any way? How did you decide that this point would be the most helpful place?

18) Do you remember the type and level of emotions you experienced during the imagery rescripting? Did it feel helpful to experience … and … level of emotion? Did it feel unhelpful in any way?

PROMPTS:
- Did you feel the same emotions that you felt at the time of the trauma?
- Did you feel new/different emotions (such as mastery and compassion)?
- Did you feel both emotions that you felt at the time of the trauma and new/different emotions?
- Did you experience any dissociation (define for participants)? Did this affect the rescripting process in any way? If so, how?

19) Do you remember how vivid/clear the image in the rescript was? Did it feel helpful for the rescript to be … vivid/clear? Did it feel unhelpful in any way?

20) Do you remember if you viewed the rescript like you were the person in the scenario (field perspective) or as if you were observing the scenario (observer perspective)? Or did you move between the two? Did … feel helpful? Did it feel unhelpful in any way?

Effectiveness of Imagery Rescripting

21) Having completed rescripting what happens now when you are reminded of the event?

PROMPTS:
- What did you find helpful about imagery rescripting in terms of your symptoms of PTSD?
- What did you find helpful about imagery rescripting in terms of your life more generally?

22) If you were telling someone about to start imagery rescripting how to get the most out of the technique so it was a success, what would you say?

Ending Questions

23) Summarise (what I have covered – memory, thoughts and feelings). **Is there anything that we have left out that is important to tell me about how imagery rescripting works? Are you sure?**

- *"The reason I am talking to you today is to find out about the things that professionals using imagery rescripting might have missed, so it's important to hear if you feel we haven't talked about something significant."*

Anything else?

Appendix 9. Consent form for participants.

[redacted]

Department of Psychology
Royal Holloway, University of London, Egham, Surrey TW20 0EX, UK

Consent form

ID number:

Imagery Rescripting (ImRs): Mechanisms of Action in Treatment for Post Traumatic Stress Disorder (PTSD)

You have been asked to participate in a study exploring peoples' experience of Imagery Rescripting (ImRs) for Post Traumatic Stress Disorder (PTSD) and why they think it is a helpful, or unhelpful, technique. This research is being carried out by Zoe Chessell (Trainee Clinical Psychologist), supervised by Dr Gary Brown (Senior Lecturer at Royal Holloway, University of London) and [redacted] Please take the time to answer the following questions. There will also be time to complete the consent form before the interview.

Have you (please circle yes or no):

• Read and understood the information sheet about the study?	Yes	No
• Had an opportunity to ask questions?	Yes	No
• Received satisfactory answers to your questions?	Yes	No
• Understood that you are free to withdraw from the study at any time, without giving a reason, and without it affecting your care?	Yes	No

Do you give your clinician permission to provide Zoe with the following information:

• Gender	Yes	No
• Date of birth	Yes	No
• Ethnicity	Yes	No
• How many sessions of ImRs completed	Yes	No
• How long since your last session of ImRs	Yes	No
• If you have experienced single or multiple trauma(s)	Yes	No
• How many of these traumas have resulted in PTSD symptoms	Yes	No
• The time since the trauma occurred	Yes	No
• If you have had any previous psychological treatment for PTSD	Yes	No
• If your clinician was a qualified or trainee psychologist	Yes	No
• Scores on questionnaires regarding PTSD	Yes	No

Do you give permission for the interview to be audio recorded?	Yes	No
Do you give permission for quotes from the interviews to be used anonymously in the final report and possible publication?	Yes	No

Do you give permission for the information you provided Zoe at the beginning of the interview and that your clinician has provided to be reported anonymously in the final report and possible publication?	Yes	No
Do you give permission for your GP to be informed that you are participating in the study?	Yes	No
Do you give Zoe permission to retain your contact details until the end of the study, until it is no longer necessary to contact you?	Yes	No
Would you like to receive a summary of the final results by post?	Yes	No
I understand that data collected from the study may be looked at by regulatory authorities or by persons from the Trust where it is relevant to my taking part in this research. I give permission for these individuals to have access to this information:	Yes	No
Do you agree to take part in the study?	**Yes**	**No**
Would you like to be sent a theory about mechanisms of action in ImRs by email and then give your feedback to Zoe by email or on the phone?	Yes	No

Name in block letters: _____

Signature of participant:_____

Date: _____

Signature of person taking consent:_____

Date: _____

NB: This consent form will be stored separately from the anonymous information you provide.

Appendix 10. Information collected from therapists about participants.

[redacted]

For treating clinician to collect from clinical records (with consent):

Name:

Date of birth:

Gender:

Ethnicity:

How many sessions do you remember having that used the ImRs technique:

Approximately how long has it been since the last session you had using the ImRs technique:

Single, multiple or sustained trauma:

If multiple traumas, approximately how many traumas have resulted in symptoms of PTSD:

Time since index trauma (that the PCL-5 was completed regarding):

Any previous psychological treatment for PTSD (what type of treatment and when):

How many treatment sessions attended at time of interview:

Treated by a core, CPD or trainee clinician:

Appendix 11. Summary of results and model sent to participants for feedback.

A Summary of the Study Findings and a Model of the Effectiveness Factors and Mechanisms of Action of Imagery Rescripting (ImRs)

Thank you again for taking the time to be part of this study. As you know, this study was about the part of your treatment where you used your imagination to change the traumatic memory by imagining ways to make it turn out differently and/or feel less upsetting. When we met for an interview you kindly agreed to be sent some information and a model about imagery rescripting, please do see this information below. I would be very interested to hear your thoughts and opinions, including anything that does not make sense or does not feel right. Thank you very much in advance.

The Study

This study aimed to explore the factors related to the effectiveness of imagery rescripting - the things before, during, and after a rescripting session that make it more or less likely to work and help in decreasing distress (for example, trusting your therapist). The study also aimed to explore the possible mechanisms of action of imagery rescripting - the fundamental, underlying things that create change (for example, change to memory). The effectiveness factors are likely to affect these mechanisms of action.

After we met for an interview, I wrote up what we discussed word for word and then looked through this information to create 'initial codes'. These codes are short summaries of what we discussed in the interviews, aiming to show the ideas and themes. The next stage was grouping these together, by seeing if there were 'initial

codes' that occurred a lot and/or ones that were particularly important for people. These were called 'focused codes'. The final stage was thinking about how the 'focused codes' could be grouped to create a model. This resulted in the 'theoretical codes'.

In the table below you can see the 'theoretical codes' and 'focused codes'. When something is considered a mechanism of action this is mentioned in brackets and everything else is considered an effectiveness factor.

Table One.

Theoretical Codes	Focused Codes
Pre ImRs session	
1. Factors preceding ImRs	1.1. Nature of the trauma memory
	1.2. Attitude towards treatment and change pre ImRs
	1.3. Attitude towards the ImRs technique pre ImRs
During ImRs session	
2. Individual differences	2.1. Importance of general imagery ability
	2.2. Ability to believe in the rescript
	2.3. Effect of mood
	2.4. Level of dissociation
	2.5. Level of motivation
	2.6. Metacognitive insight (mechanism of action)
	2.7. Level of self-efficacy (mechanism of action)
3. The importance of the therapeutic structure	3.1. Timing of ImRs in the treatment process

	3.2. Timing of the rescript in the memory
	3.3. Viewing ImRs as part of a treatment package
4. The importance of the therapist	4.1. Trust in the therapist
	4.2. Level of support and guidance with rescripting
	4.3. Using the therapist's presence in the rescript
5. Creating an effective rescript	5.1. Level of agency in choosing the rescript
	5.2. Optimal vividness
	5.3. Optimal perspective
6. Felt sense change mechanism (mechanism of action)	6.1. Changing emotions
	6.2. Changing feeling states
	6.3. Completing behavioural urges
	6.4. Generalising feeling and behaviour change to general life
7. Memory change mechanism (mechanism of action)	7.1. Changing the original traumatic memory
	7.2. Creating an alternative better memory

	7.3. A change point in the memory
Post ImRs Session	
8. Long term accessibility of the rescript	8.1. Automatically accessing the rescript
	8.2. Intentionally accessing the rescript
	8.3. Change in accessibility and strength of the rescript over time
9. Enhancing on-going use of ImRs	9.1. Rehearsing the rescript
	9.2. Developing rescripting skills
	9.3. Using rescripting aids
	9.4. Using the rescripted image more broadly
	9.5. Attitude towards the ImRs technique post ImRs

Possible mechanisms of action

The possible mechanisms of action (the fundamental, underlying things that create change) that were identified through the interviews were:

- **Change to memory representations (theoretical code 7)**. Most people found that rescripting felt like creating an alternative, more positive memory. However a few people discussed it feeling like the original memory was changed. Some people mentioned a point in the memory where it felt like it changed from the original memory to the rescript.
- **Change to an individual's felt sense (feelings) (theoretical code 6).** People described their feelings changing due to rescripting. This could be changing emotions, like decreasing fear and releasing anger. This could be a feeling state changing, like feeling less vulnerable and having more power. This could be doing things that someone was not able to at the time, like running away. Some people felt this extended to feeling differently in life more generally, like feeling less angry.
- **Change to metacognitive insight (focused code 2.6).** Metacognitive insight is developing the idea that memories and thoughts can be controlled somewhat, using the imagery rescripting technique. If a person developed the idea that memories and thoughts could be controlled this could be part of why rescripting works.
- **Change to self-efficacy (focused code 2.7).** Self-efficacy is whether an person feels like they are able to control their memories and thoughts. If a person felt able to control their memories and thoughts more than before this could be part of why rescripting works.

Possible effectiveness factors

The possible effectiveness factors (what makes imagery rescripting more or less likely to work) discussed in the interviews were grouped into factors related to before an imagery rescripting session, present at the point of an imagery rescripting session and after an imagery rescripting sessions. These were:

Before an imagery rescripting session:

- **'Factors preceding ImRs' (theoretical code 1)**. Some people found that a memory for an event that occurred more recently, a memory that was less distressing and a more complete memory increased the effectiveness of imagery rescripting. It was also suggested that having a positive attitude to treatment generally and the imagery rescripting technique specifically also increased effectiveness of imagery rescripting.

During an imagery rescripting session:

- **'Individual differences' (theoretical code 2).** High imagery ability, high ability to believe in the rescript, less low mood, low levels of dissociation and high levels of motivation generally resulted in a more effective rescript.
- **'The importance of the therapeutic structure' (theoretical code 3).** Using imagery rescripting in the later stages of the treatment process and combining it with other techniques increased effectiveness. The most effective point at which to change the original memory varied by personal preference.
- **'The importance of the therapist' (theoretical code four)**. A high level of trust in the therapist at the time of rescripting increased effectiveness. The most effective level of support and guidance and using the therapist in the rescript

varied by personal preference. A few people suggested that relying on a high level of support and guidance from the therapist could decrease self-efficacy (belief in their ability) to continue using the technique outside of sessions. Using the therapist in the rescript seemed particularly useful for when rescripting memories from childhood.

- **'Creating an effective rescript' (theoretical code 5)**. High levels of vividness and using a field perspective (viewing the rescript as if you were you, not observing it) were found to increase effectiveness. Generally a high level of choice in creating the rescript increased effectiveness, with the exception of when rescripting childhood memories, where people found the therapist making decisions to be useful.

After imagery rescripting:

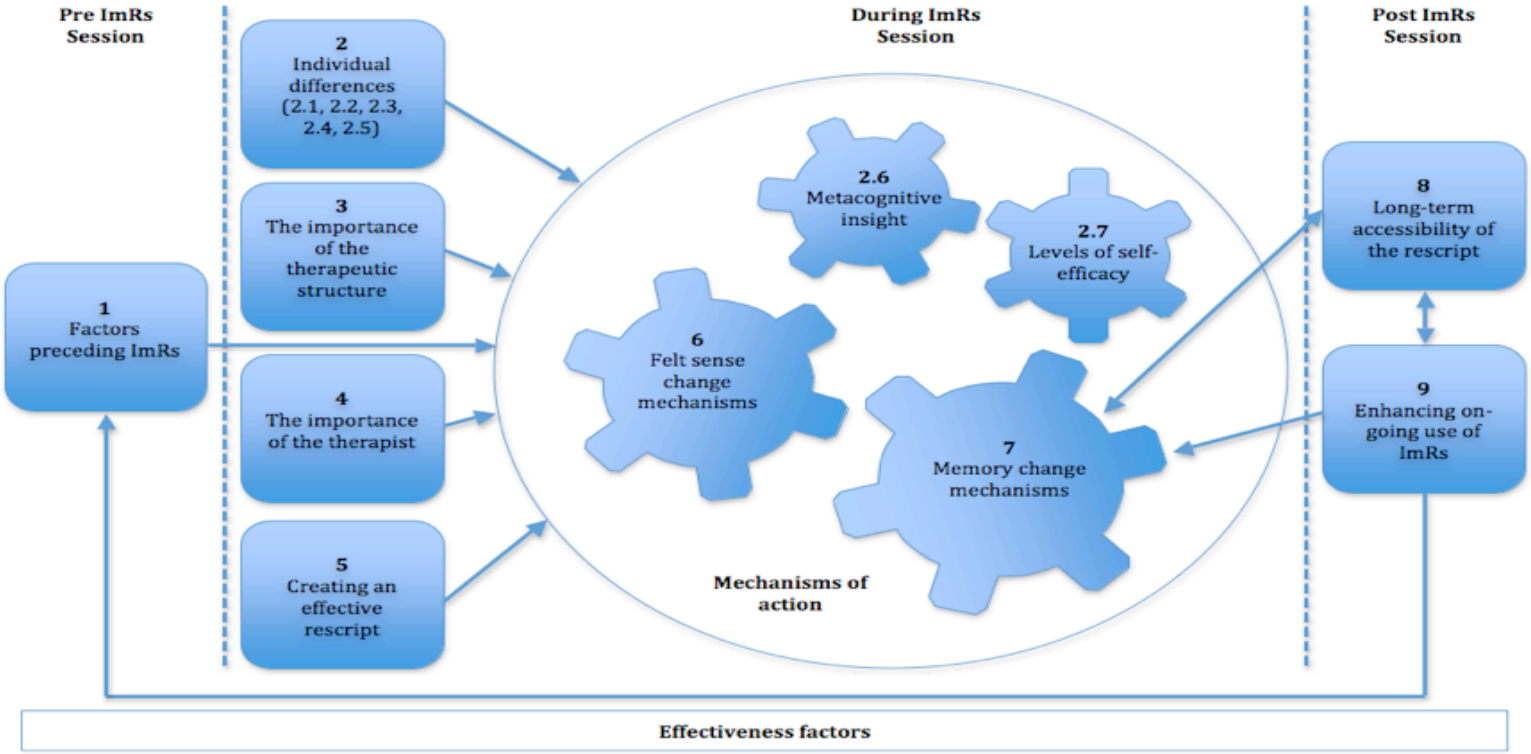
- **'Long term accessibility of the rescript' (theoretical code 8)**. Firstly, change to memory during the imagery rescripting session influenced later accessibility of the rescript. Secondly, people felt the more they accessed the memory the more effective the rescript was, increasing effectiveness over time. Generally people had to intentionally access the rescript, but sometimes it came automatically. Some people felt that the accessibility and strength of the rescript kept increasing over time.

- **'On-going use of rescripting' (theoretical code 9)**. People found that rehearsing the rescript, developing skills and using rescripting aids (images, drawings, photos) increased effectiveness. Some people found that using the rescripted

image more widely, for example as a comforting image outside of the memory, was beneficial. Furthermore, a feedback loop was discussed where a positive attitude to rescripting after completing it increased the effectiveness of the next rescript created.

The diagram below shows these findings. The cog shapes represent the mechanisms of action and the square shapes represent the effectiveness factors. The arrows show the direction of influence.

Diagram One.


Pre ImRs Session
During ImRs Session
Post ImRs Session
1 Factors preceding ImRs
2 Individual differences (2.1, 2.2, 2.3, 2.4, 2.5)
3 The importance of the therapeutic structure
4 The importance of the therapist
5 Creating an effective rescript
2.6 Metacognitive insight
2.7 Levels of self-efficacy
6 Felt sense change mechanisms
7 Memory change mechanisms
Mechanisms of action
8 Long-term accessibility of the rescript
9 Enhancing on-going use of ImRs
Effectiveness factors

Appendix 12. Template of letter to participant's General Practitioner.

[redacted]

Department of Clinical Psychology, John Bowyer Building
Royal Holloway, University of London
Egham
Surrey
TW20 0EX

CONFIDENTIAL
GP ADDRESS

DATE

Dear Dr ...

Imagery Rescripting (ImRs): Mechanisms of Action in Treatment for Post Traumatic Stress Disorder (PTSD)
Chief Investigator: Zoe Chessell (Trainee Clinical Psychologist)
[redacted]

I am writing to inform you that ..., who is a patient under your care, has chosen to take part in research in the fulfilment of my doctorate of Clinical Psychology at Royal Holloway, University of London. My supervisors for this research are Dr Gary Brown (Senior Lecturer at Royal Holloway, University of London) and [redacted]

The purpose of the study is to gain an understanding of peoples' experience of undergoing a technique called Imagery Rescripting (ImRs) as part of their treatment for Post Traumatic Stress Disorder (PTSD) and why they think it is a helpful, or unhelpful, technique. A model will then be developed that aims to explain the 'mechanisms of action' of ImRs – that is, why the technique works or doesn't work when treating PTSD. It is hoped that this will then support clinicians to understand ImRs better and use it in the most effective way in the future. This will be undertaken by conducting approximately 90 minute interviews with participants at the [redacted] which will then be analysed.

If you have any questions or would like any further information I would be happy to speak to you regarding the research. Please either contact 01784 414012 and leave a message for Zoe Chessell and I will get back to you at the soonest possible opportunity or alternatively my email address is zoe.chessell.2013@live.rhul.ac.uk. Should you wish to speak to my supervisors, please contact Dr Gary Brown at Gary.Brown@rhul.ac.uk and/or [redacted].

This research has been approved by an NHS ethics committee, a local ethics committee and Royal Holloway University ethics committee.

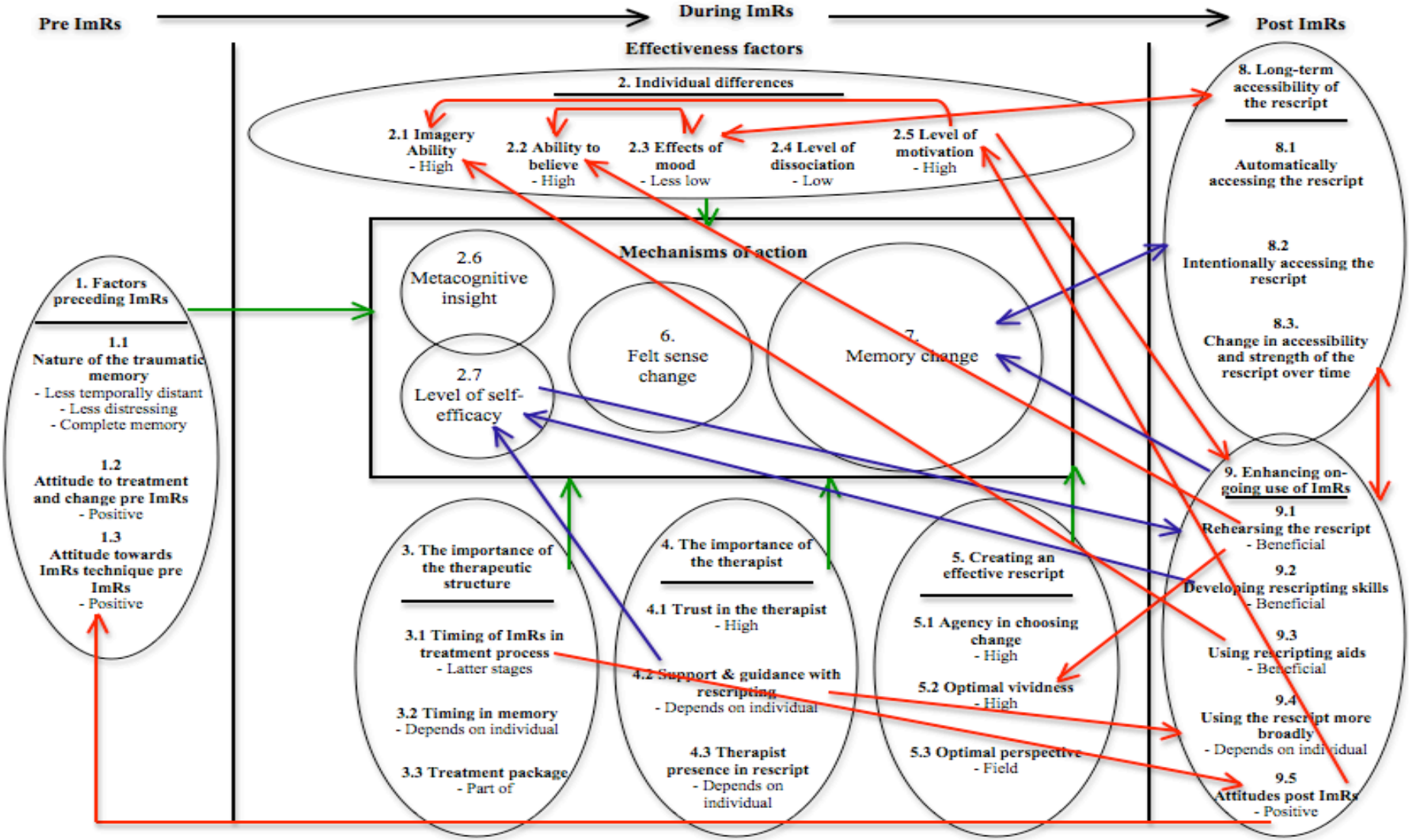
Yours sincerely,

Zoe Chessell
Trainee Clinical Psychologist

Appendix 13. Extract of a transcript and initial and focused codes.

Removed from the final electronic copy to maintain confidentiality.

Appendix 14. Detailed model of the effectiveness factors and mechanisms of action of ImRs.



Description of the detailed model:

A simplified model is presented in the results (Figure 2) and a more detailed model presented here (Appendix 14). This model specifies the direction within each focused code that increased the effectiveness of ImRs (e.g., focused code 2.1, when participants had high levels of imagery ability this increased effectiveness). This model demonstrates that theoretical codes were linked to the effectiveness of ImRs generally, without specifying a mechanism of action (see green arrows). However participants also felt that certain theoretical codes linked to specific mechanisms of action (e.g., theoretical codes 8 and 9 linking to memory change) (see blue arrows). Participants also suggested specific focused codes linked to specific mechanisms of action (e.g., focused codes 4.2 and 9.2 linking to self-efficacy) (see blue arrows). Furthermore, self-efficacy was also found to influence on-going use of ImRs (theoretical code 9) (see blue arrow). Importantly, this model also demonstrated relationships between effectiveness factors (see red arrows). This was outside the scope of the discussion of this study, however these relationships could be viewed as 'mini formulations' to consider during ImRs sessions. It should be noted that these relationships may have been discussed by one participant only and should be interpreted with this in mind.

Appendix 15. Table demonstrating the prevalence of codes in relation to each participant

Theoretical Codes	Focused codes	Participants									
		P1	P2	P3	P4	P5	P6	P7	P8	P9	P10
Pre ImRs Session											
1. Factors preceding ImRs	1.1. Nature of the trauma memory		✓	✓							✓
	1.2. Attitude towards treatment and change pre ImRs	✓				✓	✓	✓			
	1.3. Attitude towards the ImRs technique pre ImRs		✓	✓	✓	✓	✓	✓	✓	✓	✓
During ImRs Session											
2. Individual differences	2.1. Importance of general imagery ability					✓	✓			✓	
	2.2. Ability to believe in the rescript	✓	✓		✓	✓	✓	✓	✓	✓	✓
	2.3. Effect of mood	✓	✓	✓	✓		✓			✓	
	2.4. Level of dissociation			✓		✓		✓			
	2.5. Level of motivation	✓	✓	✓	✓	✓	✓				✓
	2.6. Metacognitive insight (mechanism of action)			✓		✓		✓			✓
	2.7. Level of self-efficacy (mechanism of action)			✓	✓	✓		✓			✓
3. The importance of the therapeutic structure	3.1. Timing of ImRs in the treatment process	✓	✓	✓							✓

	3.2. Timing of the rescript in the memory	✓	✓	✓			✓	✓	✓		
	3.3. Viewing ImRs as part of a treatment package	✓	✓			✓					✓
4. The importance of the therapist	4.1. Trust in the therapist					✓	✓	✓		✓	✓
	4.2. Level of support and guidance with rescripting	✓	✓		✓	✓		✓		✓	✓
	4.3. Using the therapist's presence in the rescript					✓	✓				
5. Creating an effective rescript	5.1. Level of agency in choosing the rescript			✓		✓	✓	✓	✓	✓	✓
	5.2. Optimal vividness	✓		✓			✓	✓		✓	✓
	5.3. Optimal perspective		✓	✓			✓	✓		✓	✓
6. Felt sense change mechanism	6.1. Changing emotions	✓			✓			✓	✓	✓	✓
	6.2. Changing feeling states	✓		✓	✓	✓	✓	✓	✓	✓	✓
	6.3. Completing behavioural urges	✓		✓	✓			✓		✓	
	6.4. Generalising feeling and behaviour change to general life						✓	✓	✓	✓	✓
7. Memory change mechanism	7.1. Changing the original traumatic memory					✓			✓		
	7.2. Creating an alternative better memory	✓	✓	✓	✓	✓	✓	✓		✓	✓

	7.3. A change point in the memory									✓	✓
Post ImRs Session											
8. Long-term accessibility of the rescript	8.1. Automatically accessing the rescript	✓			✓	✓			✓	✓	✓
	8.2. Intentionally accessing the rescript	✓		✓	✓	✓	✓	✓		✓	✓
	8.3. Change in accessibility and strength of the rescript over time		✓				✓	✓	✓	✓	✓
9. Enhancing on-going use of ImRs	9.1. Rehearsing the rescript	✓	✓	✓	✓	✓	✓		✓	✓	
	9.2. Developing rescripting skills		✓	✓	✓	✓		✓	✓	✓	
	9.3. Using rescripting aids	✓		✓		✓	✓	✓	✓	✓	
	9.4. Using the rescripted image more broadly	✓							✓	✓	
	9.5. Attitude towards the ImRs technique post ImRs				✓	✓	✓	✓			✓