

Single-Session Imagery Rescripting for Social Anxiety Disorder:

Efficacy and Mechanisms.

by

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Author's Declaration

I hereby declare that I am the sole author of this thesis.

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Abstract

Cognitive theories of social anxiety propose that negative mental imagery plays a central role in the maintenance of the disorder. Research has indicated that the content of such mental imagery represents negative core beliefs and derives from specific formative, negative autobiographical events. This dissertation examines the efficacy and mechanisms of imagery rescripting (IR), a novel intervention for social anxiety that works with the content of the negative autobiographical event to transform embedded meaning and corresponding affect. A total of 27 participants with a clinical diagnosis of SAD completed diagnostic assessment and a semi-structured interview designed to identify recurrent images, corresponding autobiographical memories, and the personal meaning these represent to the individual. Then, participants were randomly assigned either to waitlist or a single session of IR. Results from between- and within-group analyses indicated superiority of IR to waitlist as evidenced by significant changes in conjunction with IR from pre- to post-intervention in symptoms of emotional distress and core negative cognitions as well as other hypothesized outcome variables. These gains were generally maintained at 1-week and 1-month follow-up, with substantial effect sizes. Results indicated, in particular, that IR leads to robust changes in self-related cognitions, which, in turn, lead to decreases in SAD symptoms. Implications and future directions are discussed.

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Dedication

To my family.

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1.0 Introduction

1.1 Images in Social Anxiety

According to cognitive models of social anxiety (SA), a key factor in the persistence of the disorder is the intrusion of recurrent, negative imagery into awareness when high SA individuals anticipate or enter anxiety-provoking situations (e.g., Clark & Wells, 1995; Hofmann, 2007; Rapee & Heimberg, 1997). These images, which may contain multi-sensory and cognitive elements, consist of feared, self-relevant mental representations and are believed to highlight particularly the aspects of the self which the individual believes to be faulty or flawed (e.g. Hirsch, Clark, & Mathews, 2006; Rapee & Heimberg, 1997). The images, most typically, are a distorted picture of the self from a negatively biased observer perspective, or of a context imbued with a subjective sense of threat (Hackmann & Holmes, 2004; Hackmann, Surawy, & Clark, 1998).

Cognitive models posit a cycle that maintains social anxiety wherein negative imagery is activated when individuals are under social threat (Clark & Wells, 1995), and then relied upon for information about one's current presentation or performance. Reliance on the image as a source of accurate information is problematic because images have been shown to contain distorted representations of the self and evoke a strong emotional response (Holmes & Mathews, 2005). Due to the erroneous perception that the image is accurate and current (e.g., Hackmann et al., 1998; Hirsch, Clark, Mathews, & Williams, 2003), individuals adjust their behaviour – for example by dressing so as to conceal sweating, or planning what they will say in even a casual interaction – according to what they perceive within the image (“ex-consequencia reasoning”; Arntz, Rauner, & van den Hout, 1995; also, Hirsch, Meynen, & Clark, 2004). Such compensatory behaviours may prevent disconfirmation of biased assumptions by pre-empting the

possibility of feared outcomes (e.g., Clark & Wells, 1995; Salkovskis, 1991); hence, beliefs and assumptions are not updated, and the individual continues to perceive threat where it may not exist, and to behave according to that imaginary threat. According to recent research, most (Moscovitch, Gavric, Merrifield, Bielak, & Moscovitch, 2011) or virtually all (Hackmann, Clark, & McManus, 2000; Hackmann, Surawy, & Clark, 1998) individuals with SAD or high levels of trait SA experience recurrent, intrusive imagery.

Negative, recurrent images are proposed to contain a hybrid of stable and flexible content from long-term memory, internal cues, and external cues (Rapee & Heimberg, 1997); that is, they are comprised of an enduring image which may be altered according to the situation to include or emphasize contextually relevant content. Following from the maintenance model of SAD described above (i.e., Clark & Wells, 1995), the image's enduring content is historically-derived, carrying over feared content from the past as new information fails perpetually to be integrated into the image. Indeed, numerous studies have found that imagery content and valence correspond to specific events in autobiographical memory. Using a semi-structured interview with a clinical sample of patients diagnosed with social anxiety disorder (SAD), Hackmann and colleagues (Hackmann, Clark, & McManus, 2000; Hackmann, Surawy, & Clark, 1998; Wild, Hackmann, & Clark, 2007; Wild, Hackmann, & Clark, 2008) found that 100% of participants reported experiencing negative, recurrent, intrusive images in anxiety-provoking social situations. Using more rigorous methodology with an analogue sample of high and low SA undergraduates, Moscovitch and colleagues (Moscovitch et al., 2011) found that 76% percent of high SA participants reported such images. Furthermore, most (74%, in Moscovitch, et al., 2011) or nearly all (96% in Hackmann et al., 2000) participants who reported experiencing recurrent, intrusive images were able to identify a distressing earlier experience from which they believed

the contents of the recurrent image were derived.¹ The negative autobiographical event that participants described as corresponding to their images tended to occur around the recalled onset or marked increase of SA symptoms (Hackmann, et al., 2000), implying that the event played a pivotal role in anxiety development.. Some have likened the phenomenon of intrusive imagery in social anxiety to that of intrusive imagery in posttraumatic stress disorder (Erwin, Heimberg, Marx, & Franklin, 2006; Wild & Clark, 2011). Additionally, across methodologies and research labs, it has been found that when evoked in the present, the images retrieved by socially anxious participants tend to correspond to deeply held meanings about the self, others, or the world (Hackmann, Surawy, & Clark, 1998; Moscovitch et al., 2011; Wild et al., 2007 & 2008).

These findings may be taken together to indicate that imagery could gainfully be used as an entry-point into underlying cognitions and affect. Based on how one conceptualizes the role of imagery in social anxiety, numerous approaches might be available to decrease symptoms by working with imagery. Presently, CBT approaches to working with imagery that are common in the literature tend to correspond with a present-focused cognitive model which delineates the cyclical connections between imagery, thoughts, feelings, behaviours, and self-focused attention (see Figure 1). Techniques that work with imagery from this orientation emphasize interrupting the anxiety cycle using present-focused techniques aimed at correcting a distorted self-image through observation and hypothesis testing. The prime example of such a technique, which targets imagery specifically, is video feedback, which has been rigorously examined and refined (e.g., Orr & Moscovitch, 2011) and has been incorporated into CBT packages to improve the efficacy of commonly administered treatments (e.g., Clark, Ehlers, Hackmann, McManus, Fennell, Grey, et al., 2003). Cognitive restructuring (e.g., Hope, Burns, Hayes, Herbert, &

Warner, 2010), a staple cognitive component of CBT, may be used to challenge thoughts, such as assumptions, beliefs, and predictions, that correspond to imagery content.

In contrast to Clark and Wells' model (and related variants, such as Rapee & Heimberg, 1997, and Hofmann, 2007), cognitive theory provides us with an alternative (though complementary) transdiagnostic theoretical model to complement the present-focused model just described (see Figure 2). This model (e.g., Butler, Fennell, & Hackmann, 2009; Greenberger & Padesky, 1995; Safran, Vallis, Segal, & Shaw, 1986) attributes the impact of intrusive imagery to the negative meaning represented in the images, via negative automatic thoughts, underlying assumptions, and core beliefs. Further, it proposes that images and their associated meanings may be traced to early experiences; that is, that the source of the image's content is the subjective memory of a particular (in this case, negative) event.

To illustrate this model, the following is an example of "Jason," one of the participants from the pilot phase of the present study.² Jason reported experiencing a recurrent image of himself in which everything else disappears and he is alone in a harsh, white room with extremely bright lighting; he hears the sound of his own voice: weak, shaky, and distorted, as it echoes in this empty space. The image is imbued with a sense of intense fear, isolation, and scrutiny from some unknown source. This image occurs whenever Jason feels nervous in a social situation – for example, when called on in class and when in novel social interactions. Jason reported that, almost always, the image is followed by the spontaneous intrusion of a thought: "I wish I had my coffee. If only I had my coffee, I could speak better." Looking for the subjective meaning of this thought, and how it related to the image, he reported believing that one must be able to speak clearly and confidently in order to appear intelligent and credible; and that if one could not speak in this way, one would be victimized and accused of being "bad" or stupid.

Going beyond this conditional assumption (using the therapeutic technique of a “downward arrow”; see Methods), he reported core beliefs that, “I am dumb; other people are better than me and I can’t relate to others; and that people just don’t care.” Asked if he could recall an occurrence in his own life that would have led to the formation of the image, Jason explained that although the visual content seemed somewhat different, he knew the exact event to which the image and the accompanying thoughts and feelings corresponded. He went on to describe his recollection of an “extremely traumatic” event from his childhood in which he was wrongly accused of pushing a girl in the schoolyard and was then punished and humiliated at the front of a school assembly. He described feeling paralyzed by the situation and having no ability to speak up for himself; he felt victimized by the adults in the scene and ostracized by his peers. He believed that the situation would have been different had he been able to express himself – to say the right things to change the situation – but that, as it transpired, he had been unfairly made an example of by his teachers and, as a result, believed that he appeared stupid and “bad” to his fellow students.

What are the implications for treatment of the cognitive model depicted in Figure 2, in which negative imagery may be traced back to specific autobiographical memory and is threatening because of the idiosyncratic meaning it represents? One approach would be to access meaning through imagery and to work within the structure of the memory to create cognitive and affective change. Indeed, available evidence indicates that modification of intrusive imagery, generally, has been helpful in treating a number of disorders, including social anxiety disorder (SAD; for an overview, see Stopa, 2009). This approach is further supported by other theoretical models, including emotional-processing theory (Foa & Kozak, 1986), which asserts that memory networks must be activated in order to alter fear associations; the Interacting Cognitive

Subsystems approach (Teasdale, 1993), which emphasizes the schematic nature of the interrelationships among meaning, experiences, and emotions; and the Retrieval Competition account of cognitive behavioural therapy (Brewin, 2006), which underscores the importance of strengthening associations to positive representations in memory as a means of decreasing the influence of negative representations and related symptom-maintaining cognitions and behaviours. Indeed, targeting the imagery-memory structure is precisely what Wild and colleagues (2007; 2008) did in their pioneering trials of *imagery rescripting* (IR) for social anxiety, which are described in more detail below.

In IR (see Arntz & Weertman, 1999, for a complete description of the procedure), a therapeutically relevant autobiographical memory initially is identified. This typically consists of a negative memory that continues to influence the individual, such as one in which he or she experienced rejection, humiliation, exclusion, or was otherwise impacted in a negative manner. IR occurs in 3 phases in which the subject's idiosyncratic accounts of imagery and corresponding negative autobiographical memories are the target of 'rescripting' efforts that are geared toward altering their valence and associated meaning. In phase 1, subjects recount the memory from their own point of view *at the time of the event* (the "prior self"). Subjects are directed (and, if necessary, reminded) to describe the scene using the first person (e.g., "I am standing at the front of the class"), conveying as much detail as they can recall, including characteristics of the environment, others present, and their own feelings and thoughts, as well as the sequence of events. Once this is complete, phase 2 begins, in which subjects observe the *scene from the perspective of the current self* (the "current self"). In other words, they observe it from the perspective of an adult, as they would presumably observe it if they should happen upon the scene today. Subjects are instructed to begin to participate in the scene as their current self, doing

whatever needs to be done to make the outcome of the event more positive or satisfying for the prior self. These interventions may be interactive between prior and current self (e.g., “I look myself in the eyes and say, ‘Don’t worry if you screwed up. You’re a great kid. This event means nothing in the big picture and you’re going to go on to do so much with your life!’”), or between prior or current self and others in the scene (e.g., confronting a bully or a critical parent). The subject is encouraged to continue to intervene in the scene until the negative valence of the event has transformed and/or dissipated. In phase 3, the subject once again assumes the perspective of the prior self during the event and recounts the whole event again in the first person, this time incorporating the new content from phase 2. Finally, the researcher/therapist asks if there is anything else that the prior self would like from the current self, or if there is anything the subject wishes to see changed in the event; if so, the subject is permitted to enact this within the scene until the subject deems that it has been completed. Once phase 3 has been completed, the researcher/therapist typically acknowledges and validates the efforts of the subject (as appropriate/relevant) and collaboratively processes the experience with the subject with the intention of summarizing changes and making them explicit, thereby, helping the subject consolidate gains.

The two primary studies in this area (Wild et al., 2007 & 2008) reported promising findings on the efficacy of IR for SA. Both studies used modest samples ($n_s = 11$ and 14, respectively) of treatment-seeking individuals with a clinical diagnosis of SAD. Both studies began with a semi-structured interview to assess participants’ recurrent negative images and corresponding autobiographical memories, and to identify core beliefs/meanings encapsulated in these images and memories. In the 2007 trial, a single session of IR was administered one week after the assessment, immediately following an initial phase of cognitive restructuring, in which

negative beliefs represented by the images/memories were challenged by evaluating and weighing evidence for and against the beliefs. The 2008 study was designed in a similar fashion but also included a within-subjects control session, in which all participants initially took part in an open-ended exploration and discussion of their image and corresponding memory and then received IR in a second session one week later. Target outcome measures were assessed and compared before vs. after the active intervention. In both studies, self-report measures of distress and vividness of participants' images and memories, strength of their encapsulated beliefs, and social anxiety symptoms were administered at pre-intervention, post-intervention, and at 1 week follow up. Paired samples *t*-tests of pre- and post-intervention and repeated-measures ANOVAs incorporating scores at followup revealed significantly reduced strength of belief in negative core cognitions embedded in negative images and associated memories (Cohen's *ds* of 1.49 and 1.66 at 1-week followup vs. pretreatment in the 2007 and 2008 studies, respectively) and decreased self-reported distress associated with the negative memory targeted in the IR session (Cohen's *ds* of 4.86 and 1.57 at 1-week followup in the 2007 and 2008 studies, respectively). Further, participants reported significant decreases in social anxiety on the Liebowitz Social Anxiety Scale (LSAS-SR; Cox, Ross, Swinson, & Dorenfeld, 1998; see Methods for details), an empirically validated self-report measure of social anxiety (Cohen's *ds* of 0.76 and 1.18 at 1-week followup in 2007 and 2008 studies, respectively). In the 2008 study, symptom changes were significant after the intervention, while the control session had no effect. In a recent study, Lee & Kwon (2013) examined IR combined with cognitive restructuring as a brief "stand-alone" treatment for SAD. Comparing to a control condition (in this case, "attention and support"), this study also found significant improvements in social anxiety which were larger than those evident

in the control condition (which, in this study, also led to significant improvement relative to baseline).

These initial studies and their intriguing findings raised many important questions about both the nature of the mechanisms that may be responsible for the efficacy of IR for SAD and the methodology used in the administration and evaluation of this new intervention. For example, the methodology used in these two studies prevented clear conclusions from being drawn about the unique impact of IR because of the inclusion of cognitive restructuring (CR) in the treatment protocol. Indeed, at the time of the present study's design, Wild and colleagues' trials were the only ones available in the literature. During the time that the present study was being run, a new study was published that examined the efficacy of IR without the inclusion of CR (Nilsson, Lundh, & Viborg, 2012). Nilsson and colleagues found that IR was efficacious even in the absence of CR, both from pre- to post-intervention and in comparison to an inert control condition to which half of the participants were randomly assigned, with effect sizes for between-groups comparisons that were comparable to the within-group comparisons reported by Wild and colleagues for symptom measures [Cohen's d s = 1.18 and 0.63, on the Fear of Negative Evaluation scale (FNE; Watson & Friend, 1969) and the Social Interaction Anxiety Scale (SIAS; Mattick & Clark, 1998), respectively; changes to degree of negativity of meaning of the image (Cohen's d = 2.59); and reductions in imagery and memory distress (Cohen's d s = 0.51 and 1.38, respectively)].

Building upon these previous studies, the present study aimed to clarify previous findings about the efficacy of IR without CR and also to extend the empirical examination of IR for SAD by measuring its impact on specific therapeutic change processes and outcomes. It was expected that measuring the impact of IR on a variety of hypothesized change processes in the present

study could help to inform future hypothesis-driven studies that would be designed specifically to investigate the mechanisms (i.e., mediators and moderators) underlying the efficacy of this specific intervention. Furthermore, a waitlist (WL) control condition and random assignment of participants to either IR or WL were included so as to isolate the impact of the intervention over and above any changes that may occur simply due to the passage of time, the repeated measurement of outcome variables within a single active condition, and/or any non-specific effects that may be related to inclusion in a therapy trial.

1.2 Overview of the Present Study

In this dissertation, I examined the efficacy of IR (without CR) administered as a single-session intervention in comparison to a WL control condition and a set of theoretically derived change processes. Outcome and process measures were assessed at pre-treatment, post-intervention and at 1-week and 1-month followup time points. Despite the compelling previous research on IR for SAD (Nilsson et al., 2012; Wild et al., 2007 & 2008), important questions remained both about the specific effects of this intervention and the nature of the processes that may drive symptom reduction. Thus, replication of previous findings on the effects of IR on symptom reduction in SAD was of interest, but a further goal was to improve understanding of the possible “active ingredients” of IR by measuring changes in therapeutically-relevant processes and outcomes and examining the correspondence between changes in such processes and changes in social anxiety symptoms.

Our first objective was to examine the efficacy of IR with respect to improving symptoms of social anxiety and depression, changing the strength and valence of negative core beliefs, modifying the influence of the image on participants’ perceptions of self, others, and the world,

and changing perceptual qualities of recurrent imagery and negative memories in SAD. Perceptual qualities include how real the image seemed, the ability to mentally change or manipulate features of the image, how much shame and embarrassment about aspects of the self are represented in the image. An important starting place, it seemed, for refining the methods of earlier studies (Wild et al., 2007 & 2008; and more fully detailed in Wild & Clark, 2011) was to revisit the context for the delivery of IR. This was considered important because the method of the first two studies on this topic (Wild et al., 2007 & 2008) did not ascertain the unique impact of IR because, as it was delivered, IR was preceded by formal CR. In other words, IR was *combined* with a technique already well-known to be effective (e.g., Mattick & Peters, 1988; Taylor, 1996). Hence, as a first step in making a meaningful contribution to the field's understanding of IR, in the present study IR was conducted in isolation from other treatment techniques.⁴ As well, the study design allowed for the investigation of whether "insight alone" into one's underlying memories is sufficient to create the context for symptom change. Indeed, prior research (e.g., Hackmann et al. 2000) has noted that subjects undergoing clinical interviews to identify imagery and related memories often suddenly become aware of the connection between their image and their earlier memory. Our study was designed in a manner that allows us to determine whether this insight alone might be driving the effects of IR. Since imagery and memories are assessed in an initial session before participants are randomly assigned to either waitlist or active treatment, it would be reasonable to presume that if insight alone has significant therapeutic effects, symptom changes would occur even during this initial session, even among participants who are ultimately assigned to the waitlist control group. As such, symptoms were measured both before and after this initial session.

In Wild and colleagues' initial trial on IR (2007), no control condition was used; thus, results consisted of within-subjects comparisons. The two subsequent trials of IR (Wild et al., 2008 and Nilsson et al., 2012) improved upon the methodology of the first study by employing control conditions. In the first of these, the within-subjects control condition consisted of a single session of open-ended memory and image discussion and exploration, without therapeutic direction. Results showed that the therapeutic effects were isolated to the subsequent session in which the active intervention was administered, as no changes to target variables were evident immediately following the control session or one week later. This was certainly informative, over and above a no-control design, but the other major methodological problem – namely, that CR was combined with IR - still remained unaddressed. In Nilsson and colleagues' study (Nilsson et al., 2012), further refinements were introduced. First and foremost, IR was delivered without CR. Second, this group also included a between-subjects control condition in their design to which half of the participants were randomly assigned (in this case, a reading task in which participants perused information about CBT). In analyzing efficacy, the primary comparisons were, therefore, computed *between-* rather than within-subjects, which helped to control for the possibility of any cumulative or delayed impact of a within-subjects control session, like the one used in Wild and colleagues' design. The results of this 2012 study indicated that IR was efficacious in the absence of CR relative to the control condition, with comparable effect sizes as those reported in the earlier studies, as detailed above.

As in the Nilsson et al. (2012) study, an inert control condition was used (waitlist; WL; see Methods, below, for details), with comparisons between the control and active conditions measured at pre-treatment, post-treatment, and 1-week followup. Previous studies of IR for SAD found strong effects of the treatment immediately following intervention, as well as at 1-week

followup. Given the endurance of improvements over one week in previous studies, studying the maintenance of gains over a longer period of time was of interest. Assessment after one week has the greatest implications for IR within the context of a treatment plan with weekly sessions; to improve understanding of IR as a stand-alone intervention, in the present study, outcomes of IR were also observed after a longer passage of time – in this case, one month.

Beyond symptom reduction, a secondary set of questions in the present study pertained to whether the intervention would lead to identifiable changes across more highly specified therapeutic process variables. This set of questions was of particular interest, given the paucity of investigation into the “active ingredients” of IR. Based on theory and clinical observation, there were a number of variables that were hypothesized to change as a result of IR and to be significantly associated with changes in symptoms during the active intervention. These are detailed below.

1.3 Primary Research Questions and Hypotheses: Efficacy of Imagery Rescripting

1.3.1 Symptom reduction. The primary topic of inquiry in the present study was the efficacy of IR as a stand-alone, single-session intervention. I hypothesized that immediately following the intervention and at 1-week and 1-month followup, participants who received IR would report significant decreases in symptoms of social anxiety (on the SPIN and LSAS-SR; see Measures section and Timeline, Appendix A) and depression (on the depression subscale of the DASS) relative to pretreatment. To ascertain the strength of such effects while ruling out effects of participation in the study (both in general and as a result of assessment sessions within the study) and the passage of time, comparisons were made between the changes participants reported in the IR condition from pre-treatment to post-treatment and followup and changes the

participants who were randomized to the WL condition reported over the same time points. I hypothesized that the active treatment condition would produce significantly better results than WL. Two followup assessments were conducted in order to ascertain whether gains made at the time of treatment would be maintained. The first followup time point (FU1) was set for one week following the intervention, because it was expected that IR should typically be administered as part of a longer course of cognitive-behavioural therapy. Within this context, it would seem most relevant to measure maintenance of gains at the most likely next point of contact in therapy; as well, prior studies in this area have also assessed outcomes at 1-week followup, as reviewed above. The second followup time point (FU2) was scheduled for 1 month following the IR session, and was designed to measure stability of change. It was hypothesized that the outcomes observed at post-intervention would be maintained at 1-week followup, as in previous studies. No previous studies have examined the longer-term effects of IR, and so although it was expected that the effects of the intervention would continue to be maintained at FU2 to some degree, no specific hypotheses were advanced about whether they would likely become diminished somewhat due to rebound effects or become even stronger due to continued consolidation of gains following the intervention.

For analysis of change process variables, detailed below, within-subjects analyses were primarily used, for two main reasons: first, change over time within participants who received IR was the phenomenon of interest and this fits, conceptually, with a within-participants approach to analysis. Second, because participants initially randomized to the WL condition later received IR as well, it was possible to merge participants across the two conditions and examine change process variables in a series of strongly powered within-subjects analyses.

1.3.2 Changes in negative core beliefs about the self, others, and the world. I

hypothesized that *content* of the target negative cognitions would be revised to assimilate new information derived from the intervention. This variable was operationalized by simply counting the proportion of participants who generated new or revised core beliefs following the intervention⁵. I also hypothesized that, in addition to possible alterations to the *content* of original core beliefs associated with the memory and image, the strength with which participants held the original core beliefs would decrease. In other words, I hypothesized that the original negative beliefs would not simply disappear but, rather, as the Retrieval Competition Hypothesis would dictate (Brewin, 2006), it was expected that participants would hold those beliefs with much less conviction after IR than they had at baseline (or that the original beliefs would be less accessible to them). Further, I hypothesized that changes to- and decreased strength in core beliefs would occur across all three domains (self, others, and the world) following IR. Specifically, while IR would seem likely to target self-representations and associated meanings most expressly, clinical experience has shown – particularly in the context of *socially* traumatic memories – that negative core beliefs about others are also highly relevant and therefore likely would be modified and/or weakened if the treatment was administered effectively. Further, core beliefs about the world in general seem to derive from pivotal experiences and, in effect, subsume corresponding beliefs about self and others. Simply put, one’s perception of what the world is like seems to be at least partly contingent on one’s experience of the self as subject/actor in the context of the world (i.e., beliefs about self) and others’ actions and underlying nature (i.e., beliefs about others). Thus, while the typical activities of IR might not directly challenge core beliefs about the world, new conclusions might be drawn about the world (or old impressions and beliefs might be weakened) if the target memory is considered to be representative of the

broader world. Therefore, it was also hypothesized that changes to negative core beliefs about the self, others, and the world would change and/or weaken as a result of IR..

1.3.3 Changes in memory and imagery characteristics. As in prior studies (Nilsson et al., 2012; Wild et al., 2007 & 2008), characteristics of the recurrent image and corresponding memory were examined for change at both followup time points as a result of the intervention. Towards replication of earlier findings, levels of distress associated with the image and memory were hypothesized to decrease as a result of the intervention. Other salient characteristics were also expected to change following IR: how real the image seemed, ability to mentally change or manipulate features of the image, feelings of shame and embarrassment about aspects of the self represented in the image, and the influence of the image on perceptions of self, others and the world.

1.4 Secondary Research Questions and Hypotheses: Specific Therapeutic Processes in Imagery Rescripting

1.4.1 Differentiation of prior self and current self. In their cognitive model of SA, Clark and Wells (1995) argue that, for the individual with SAD, the level of anxiety activation is inappropriate relative to the current level of objective threat in the social situation. During the process of IR, the participant experientially elaborates the perspective of the prior self versus that of the current self, and in doing so, the two are forced into contrast. By alternating between the perspective of the prior self and the current self, a distinction is made between the self that was the subject of the original event who endured the event in the past and the current self that is recalling and reliving the event in the present. This differentiation (as measured by ratings of *differentiation* statements; see Measures, below) was hypothesized to facilitate an updating of memory contents/features that participants perceived as being self-relevant threat. Specifically,

IR should create an experience in which the participant disambiguates what was threatening to the self in the past within the context of a previous negative social experience from how he or she would perceive and respond to that same threat as his/her current self within the context of present day social encounters. Hence, I hypothesized that differentiation from prior self would increase with IR.

1.4.2 Perceived shift in empowerment. The original memory may be imbued with strong feelings of powerlessness. Clinical observation, as well as available evidence (e.g., Erwin et al., 2006; Hackmann, Clark, & McManus, 2000; Moscovitch et al., 2011), indicate that pivotal, traumatic social memories are often characterised by victimization, alienation, exclusion, rejection, humiliation, or other experiences in which the subject perceived themselves as having little power to influence these highly personal outcomes . Part of the nature of IR is that the subject is instructed and encouraged to take an active and assertive role in meeting his/her own needs. Hence, a new sense of empowerment may become associated with the image and memory, in place of the previous feelings of powerlessness (as measured by the *perceived empowerment* ratings; see Measures). Thus, it was hypothesized that subjects' sense of empowerment perceived within the memory would increase as a result of IR. Given that IR is an imaginal intervention, the definition of psychological empowerment as “an experiential mental state rather than an objective condition” (Barak, Boniel-Nissim, & Suler, 2008) is fitting.

1.4.3 Changes in compassion, forgiveness, and acceptance towards self and others. The subjective tone of the target memory may change for the individual as a result of IR, such that they view themselves or others differently. As part of the intervention, subjects' views of themselves may shift from extremely negative to more compassionate. For example, having previously viewed the self in one's memory as being a “weakling,” one may now view him as a

child needing and worthy of protection (see Gilbert & Procter, 2006, for an interesting review of compassion in mental health and as a particularly important component of overcoming shame and self-criticism). Similarly, as part of this process, subjects may come to view others more generously, perhaps understanding for the first time the motivations or vulnerabilities of others who were part of the event, leading to increased compassion for others. Indeed, although compassion is not a formalized instruction in IR (as per Arntz & Weertman, 1999), it has been observed that enhancing self-compassion may be an important element of the third phase of the rescripting intervention, in particular (Hackmann, 2005; Wild et al., 2008). Second, forgiveness, both towards self and others (Worthington, O'Connor, Berry, Sharp, Murray & Yi, 2005), will be examined. Through the process of revisiting and then rescripting the memory, subjects may come to be more forgiving of the self for previously perceived flaws or faulty behaviour. Likewise, while others may once have been viewed as extremely powerful perpetrators, they may now be viewed as regular human beings who are capable of being flawed, and whose role in the event may be forgivable. Finally in this vein, changes to acceptance towards self and others (e.g., Hayes, Strosahl, & Wilson, 1999) will be examined. Theoretically, both compassion and forgiveness should lead to acceptance; practically, measuring changes to acceptance towards self and others might be useful for the conceptual integration of IR into “third-wave” (e.g., Hayes, 2004; Levin & Hayes, 2011; Orsillo, Roemer, Lerner, & Tull, 2004) CBT programs. These constructs were measured in the present study using the *compassion*, *acceptance*, and *forgiveness* ratings (see Measures).

1.4.4 Gaining objective distance (or defusion) from beliefs. Various known as cognitive defusion (Hayes, Strosahl, & Wilson, 1999), comprehensive distancing (Zettle & Hayes, 1986), decentering (Teasdale, Moore, Hayhurst, Pope, Williams, & Segal, Z.V., 2002), re-perceiving

(Shapiro, Carlson, Astin, & Freedman, 2006), or self-distancing (e.g., Ayduk & Kross, 2010; Kross, 2009; Kross et al., 2005), I proposed that one consequence of IR would be that participants would come to view the core beliefs associated with the image and memory from a vantage point of greater psychological distance. The term “cognitive defusion” has been used in the literature by Hayes and colleagues (1999) and other authors (e.g., Forman et al., 2011) to describe the process of achieving greater cognitive distance from one’s internal psychological experiences and, thus, I have adopted this terminology here as well. Cognitive defusion was assessed in the present study using author-generated items as well as items from the *Drexel Defusion Scale* (Forman et al., 2011; see Measures). Given the central role in IR of introducing a new perspective to the formative memory and corresponding meaning, detachment from those beliefs would seem to be implicated in such a process.

1.5 What Explains Symptom Change? Correlating Symptom Change with Changes to Other Outcome Variables

The present study also aimed to answer preliminary questions about possible mechanisms of change. Ideally, such questions would be addressed using mediational models and corresponding data analysis. The study design and temporal sequencing of measured variables did not meet the requirements for a causal mediational model to be proposed or analyzed (e.g., Baron & Kenny, 1986; MacKinnon, Lockwood, Hoffman, West, & Sheets, 2002). Instead, a more exploratory approach was taken for analyzing which of our significant process variables corresponded with symptom changes as a result of IR by examining correlations between changes in process variables from pre- to post-treatment and changes in symptom outcomes from intake to 1-week followup. As described above, a number of variables were

predicted to change as a result of IR, but which of these variables might account specifically for symptom reduction was an open question with important implications for developing an initial understanding of the “active ingredients” in IR and for informing future hypothesis-based studies on mechanisms of treatment.

2.0 Methods and Materials

2.1 Participants

The sample for this study consisted of undergraduate student participants with a clinical diagnosis of SAD. Participants were recruited for the study via the University of Waterloo Research Experiences Group, a centralized recruitment mechanism within the Department of Psychology in which potential participants complete a number of online measures at the start of every semester, and are then recruited into individual studies if they meet pre-established criteria. To be invited for the present study, potential participants were required to meet or surpass the cutoff scores (described below) on two widely-used self-report measures of social anxiety, the *Social Phobia Inventory* (SPIN; Connor, Davidson, Churchill, Sherwood, Foa, & Weisler, 2000) and the *Liebowitz Social Anxiety Scale* (LSAS; Liebowitz, 1987). Participants were not aware of these inclusion criteria. When invited into the laboratory, potential participants then took part in a clinical assessment, in which they completed the Mini International Neuropsychiatric Interview (M.I.N.I. 6.0; Sheehan et al., 1998) with a senior graduate student assessor (SGR) with extensive background in psychodiagnostic assessment, and completed the SPIN and LSAS again. Exclusion criteria for the study were 1) active suicidality; 2) psychosis; 3) alcohol or substance use/abuse that would interfere with participation; 4) principal diagnosis of a psychological disorder other than social anxiety disorder. Those who both continued to score above the cutoff points on the two measures and met full DSM-IV-TR (American Psychiatric Association, 2000) diagnostic criteria for a current principal or co-principal diagnosis of social anxiety disorder, and who did not meet predetermined exclusion criteria, were offered continued participation in the study. Using this selection process, 60 participants took part in the psychodiagnostic assessment session, based on their initial SPIN and LSAS scores. Of those 60, 28 met criteria for a diagnosis

of SAD when assessed using the M.I.N.I., and were therefore offered participation in the remainder of the study. One participant opted to discontinue at the conclusion of the assessment session (due to scheduling constraints that became apparent while trying to book subsequent sessions), while 27 continued. Remuneration for participants' time consisted of money (\$5/half hour) or a combination of money and participation credits towards their psychology courses; time spent in the study ranged from 6 to 9 hours for those who completed the full study (being in the waitlist condition added 2 hours of participation time, during which participants completed two 1-hour questionnaire sessions, as outlined in the Timeline in Appendix A).

2.2 Procedure

All potential participants ($n = 60$) completed the intake session, which was comprised of the informed consent process and completion of a semi-structured diagnostic assessment interview (the M.I.N.I., see below), followed by a standard series of questionnaires. All those who met inclusion criteria and chose to continue in the study ($n = 27$) were then randomly assigned to either the Waitlist (WL) or non-Waitlist (nonWL) conditions and completed a pre-IR 90-min session in our laboratory which consisted of meeting with the experimenter (SGR) to complete the *Waterloo Images and Memories Interview* (WIMI, Moscovitch et al., 2011) and the *Associated Cognition Supplement* (ACS) (see below). Participants who did not endorse experiencing recurrent negative imagery ($n = 1$) or who did not identify a specific autobiographical memory to which the image might have corresponded ($n = 1$) discontinued their participation following the pre-IR session. NonWL participants ($n = 13$) returned the following week for another 90-min in-house session, which consisted of the IR intervention (described in detail below), followed by questionnaires ('post-IR'). At both one week and one month post-IR,

nonWL participants then completed two followup questionnaire sessions (FU1 and FU2), which were administered online from a location of their choice. As outlined in the Timeline flowchart in Appendix A, participants in the WL condition ($n = 12$) completed online questionnaires at time points (WL1 and WL2) that corresponded in time with the IR and FU1 sessions for participants who were assigned to the IR condition. Following WL1 and WL2, all WL participants then received the IR intervention and post-IR questionnaires and completed the FU1 and FU2 assessments one week and one month after the intervention. With this design, measurements were taken for both groups in parallel, matching responses of WL control participants with those who received the active treatment at both post-IR and FU1. Identical sets of measures were administered at WL1, WL2, FU1, and FU2, as outlined in Appendix B.

2.3 Materials

2.3.1 Clinician-Researcher Administered Interviews

2.3.1.1 Mini-International Neuropsychiatric Interview (M.I.N.I.; Sheehan et al., 1998).

The MINI is a short, semi-structured diagnostic interview based on DSM-IV-TR criteria. The Social Anxiety Disorder module from the Anxiety Disorder Interview Schedule - IV (ADIS-IV; Di Nardo, Brown, & Barlow, 1994) was also included in the present study to ensure adequate solicitation of relevant information.

2.3.1.2 Waterloo Images and Memories Interview (WIMI; Moscovitch et al., 2011; Appendix J).

To inquire about the presence of recurrent, intrusive images, the *Waterloo Images and Memories Interview* (WIMI; Moscovitch et al., 2011) was used in the present study. The WIMI was originally developed to aid the empirical investigation of images and memories in a valid and reliable manner. It is a standardized, semi-structured interview that assesses the presence of negative and/or positive images and associated autobiographical memories in

anxiety-provoking and non-anxiety-provoking social situations. In the present study, the WIMI was used in its original format, except that inquiries were limited to images and corresponding memories that intrude in *negative*/anxiety-provoking social situations only (i.e., the probes about positive images/memories were eliminated).

2.3.1.3 Associated Cognitions Supplement to the WIMI (see Appendix K). The WIMI protocol, as developed, does not explicitly explore the idiosyncratic meaning of the image/memory for each participant. The Associated Cognitions Supplement (ACS), which was created for use in the present study, elaborates this aspect of the WIMI by explicitly pursuing the automatic thoughts and underlying beliefs associated with participants' endorsed images in a standardized, semi-structured way within the interview itself. For the present study it was important to identify the personal meaning represented by, or embedded within, participants' endorsed images and memories more systematically than previous methods permitted. Previous research (Hackmann et al., 2000) established that beliefs tend to be embedded within such imagery, but such information has not been systematically reported (or possibly, elicited). Thus, the purpose of including this module in the present study was to have a consistent means of inquiring about the presence and content of cognitions embedded in imagery and to examine the extent to which IR vs. WL might impact those cognitions over time. The ACS was appended to the WIMI in the pre-IR session; findings from the ACS were recorded on the Image/Memory/Cognition Summary Sheet (IMC Summary; Appendix L) and the programming of the questionnaires permitted participants' unique content to be embedded in subsequent administrations of *imagery*, *memory*, and *associated cognition* items in the following questionnaire sessions.

2.3.2 Self-Report Measures

2.3.2.1 *Social Phobia Inventory* (SPIN; Connor, Davidson, Churchill, Sherwood, Foa, & Weisler, 2000; Appendix C). The SPIN is a 17-item self-report scale that reliably screens for social anxiety. Participants indicate the extent to which each item has been difficult for them during the past week, using a 5-point Likert type scale ranging from 0 (“Not At All”) to 4 (“Extremely”); for example, “I am bothered by blushing in front of people,” and, “I avoid doing things or speaking to people for fear of embarrassment.” The SPIN has demonstrated good test-retest reliability (Spearman’s $r = .89$; Connor et al., 2000) and excellent internal consistency ($\alpha = .94$; Connor et al., 2000). The SPIN can distinguish individuals with clinical levels of SAD from both nonclinical (Connor et al., 2000) and clinical (Antony, Coons, McCabe, Ashbaugh, & Swinson, 2006) control participants. Although Connor and colleagues (2000) proposed a cutoff score of 19 and higher to select participants who are likely to have SAD, others (e.g., Moscovitch, Rodebaugh, & Hesch, 2012; Moser, Hajcak, Huppert, Foa, & Simons, 2008) have expressed a preference for using a more stringent cut-off score of 30. In the present study, a cutoff score of 30 was used for initially identifying potentially eligible participants. The SPIN was administered at various time points during the study (see contents of each time point, Appendix B, for summary of administrations). In the present study, the SPIN demonstrated acceptable internal consistency, with Cronbach’s *alphas* ranging from .75 to .90 across 7 administrations (intake, pre-IR, post-IR, WL1, WL2, FU1, and FU2).

2.3.2.2 *Liebowitz Social Anxiety Scale – Self Report* (LSAS-SR; Cox, Ross, Swinson, & Dorenfeld, 1998; Appendix D). The LSAS-SR is a 24-item scale on which participants rate their fear and avoidance of a variety of social situations over the past week using a 4-point Likert

scale. The fear scale ranges from 0 (no fear) to 3 (severe fear). Avoidance levels across items are also rated using the same numerical anchors, which correspond to the percent of time the participant claims to avoid the situation, with scaling of 0=never; 1=occasionally (10%); 2=often (33-67%); 3=usually (67-100%). A widely-used measure of social anxiety, the original clinician-administered version of the LSAS (Liebowitz, 1987) has demonstrated strong validity, reliability, and treatment sensitivity (Heimberg, Horner, Juster, Safren, Brown, Schneier, & Liebowitz, 1999). The theoretically proposed factor structure in which fear and avoidance are considered distinct constructs has not been statistically supported (Heimberg et al., 1999; Oakman, Van Ameringen, Mancini, & Farvolden, 2003; Safren, Heimberg, Horner, Juster, Schneier, & Liebowitz, 1999). The LSAS-SR also produces a useful total score which may be used to screen for clinical levels of SA, with research showing that a cutoff score of 47 is optimal to achieve the right balance of sensitivity and specificity (Mennin, Fresco, Heimberg, Schneier, Davies, & Liebowitz, 2002). The self-report version of the scale correlates highly with the clinician-administered version (e.g., Baker, Heinrichs, Kim, & Hofmann, 2002) and total LSAS-SR scores achieve strong test-retest reliability ($r=0.83$, $p<0.01$), internal consistency (Cronbach's $\alpha=0.95$), and treatment sensitivity (Baker et al., 2002). In the present study, a cutoff of 47 was used to preselect participants. LSAS-SR scores were also used as a secondary outcome measure at each session (see Appendix B), and the measure demonstrated good internal consistency (Cronbach's α s ranged from .91 to .96 across 7 administrations).

2.3.2.3 Depression Anxiety Stress Scales 21-item (DASS-21; Lovibond & Lovibond, 1995; Appendix E). The DASS-21 is a 3-factor self-report scale of depression, anxiety, and stress. Each subscale in the 21-item version has excellent internal consistency (Cronbach's α of .97, .92, and .94 for Depression, Anxiety, and Stress subscales, respectively) and concurrent

validity (Antony, Bieling, Cox, Enns, & Swinson, 1998). For the present study, the DASS was administered to ensure that participants across the two conditions did not differ in reported levels of depression symptoms. Repeated administration of the DASS was also used to examine changes in depression symptoms across time. In the present study, the DASS_D demonstrated acceptable internal consistency (Cronbach's *alphas* ranged from .77 to .94 across the 7 times it was administered in this study).

2.3.3 Subjective ratings

Participants rated the subjective qualities of their endorsed image, associated memory, and associated cognitions on three sets of items assembled for the present study: *Image Items*, *Memory Items*, and *Associated Cognitions Items*. These items were empirically-derived and, wherever possible, adapted from previous studies (e.g., Moscovitch et al., 2011).

2.3.3.1 *Image Items* (Appendix F) were administered (a) at the pre-IR session, following the Imagery segment of the Waterloo Images and Memories Interview (WIMI; Moscovitch et al., 2011) and (b) at each of the followup sessions (see Appendix B). The rationale for not administering the *Image items* immediately following the intervention (i.e., post-IR) was that such imagery typically occurs *spontaneously* with relatively variable content in naturalistic settings; thus, we reasoned that participants would initially need to experience the occurrence of the “transformed” image spontaneously in their naturalistic social settings in the week following the intervention in order to report on and rate their characteristics in the *Image items*. On a 5-point scale from 1 (very little or not at all) to 5 (extremely), participants rated their responses to items across the following categories:

- (1) How real the image seemed.
- (2) Ability to mentally change the contents of the image.

- (3) How much embarrassment and shame they felt about aspects of the self that were represented in the image.
- (4) Influence and meaning of the image on their perception of self, others, and the world in general (e.g., “The mental image influences how I view myself.”)

2.3.3.2 *Memory Items* (Appendix G). Beginning at the pre-IR session and then in each subsequent session, on a 5-point scale from 1 (very little or not at all) to 5 (extremely), participants rated their responses to items across the following categories:

- (1) Emotional impact of the memory. Using three individual items (how intense, how negative, and how anxious), participants rated how they felt while remembering the event.
- (2) Influence and meaning of the event (e.g., “The memory was of an event that I am embarrassed, ashamed, or otherwise don’t feel very good about;” “This event influenced how I view myself.”)
- (3) Differentiation of prior self and current self (i.e., 2 items, “I ‘identify’ with the person I was at the time of the event (i.e., I feel like I am similar now to the person I was then),” and “I no longer ‘identify’ with the person I was at the time of the event.”). These two items, scaled from 1-5 were developed for the present study. As a two-item composite scale, Cronbach’s alphas ranged from poor (.51) to acceptable (.84) across the 6 times the items were administered, so rather than using a composite of these items, they were analyzed separately.
- (4) Perceived empowerment (i.e., “The memory of this event is imbued with a sense of powerlessness,” and “recalling the memory now, I feel a sense of empowerment.”). These

two items were developed for the present study. When combined into a 2-item composite measure, alphas ranged from unusually poor (-.15) to acceptable (.73) across administrations. Given the relatively poor reliability of the composite measure, each item was analyzed separately.

- (5) Changes to compassion, forgiveness, and acceptance towards self and others. (e.g. “I feel compassion towards the other people who were part of the memory.”). The individual items for each construct were measured on a scale of 1-5. Across the 6 administrations in the study, the 3-item composite scale (with a possible range of 3-15) produced Cronbach’s alphas for *self* in the memory ranging from .41 to .83, and for *others* in the memory ranging from .70 to .93. Because these items did not generally demonstrate adequate reliability as a composite measure, they were each analyzed individually.

The *Memory Items* set was administered (a) at pre-IR, following the Memory segment of the WIMI, (b) at post-IR, immediately following the intervention, and (c) at each of the followup sessions, as outlined in Appendix B.

2.3.3.3 *Associated Cognitions Items* (Appendix H). Using a 100-point scale, participants rated the strength of belief in the idiosyncratic ‘associated cognitions’ (i.e., automatic thought and core beliefs about self, others, and the world) identified within the Associated Cognitions Supplement (ACS) to the WIMI. Specifically, they rated the extent to which they *believed* each of the target cognitions; that is, how *true* or *likely* it seemed to them at the present time. The *Associated Cognitions Items* set was administered (a) at the pre-IR session, (b) at post-IR following the intervention (c) at WL1 and WL2 (for participants in the WL condition), and (d) at each of the two followup sessions (see Appendix B). Item and/or instructional wording varied slightly as appropriate across administration time points.

2.3.3.4 *Drexel Defusion Scale* (DDS; Forman, et al., 2011; Appendix I). The DDS is a new measure of *cognitive defusion*, which is defined by the authors as the “ability to achieve psychological distance from internal experiences such as thoughts and feelings” (Forman et al., 2011). Participants rated on a scale from 0 (*Not at all*) to 5 (*Very much*) the extent to which they were able to *defuse* from 10 different kinds of internal experiences (e.g., feelings of anger or thoughts about one’s future). The questionnaire is preceded by a detailed instruction set so as to ensure understanding of the target construct by participants. The scale is composed of 10 items and has a 2-item optional social anxiety supplement (which addresses anxiety about group situations and anxiety about one-on-one situations). Findings from the initial validation study (Forman et al., 2011) indicated that the DDS items all load onto one factor and that the measure demonstrates good internal consistency (Cronbach’s alpha = .83) and strong convergent and discriminant validity (i.e., stronger associations with other measures of defusion and weaker associations with related but conceptually distinct constructs such as mindful awareness and acceptance). In the present study, an additional 3 items were added, for which participants used the same scale to rate the extent of their defusion from the specific, idiosyncratic core beliefs associated with their recurrent image (as identified in the Associated Cognitions Supplement). Instructions for these items were as follows: “Based on the definition of defusion above, please rate each of your own thoughts/beliefs for how much you are in a state of defusion from the thought as you experience it. That is, how much you achieve internal distance from the thought.” The DDS was administered at each time point, with the 3 study-specific items being administered following the WIMI and thereafter. In the present study, overall/general DDS demonstrated acceptable internal consistency (Cronbach’s *alphas* ranging from .75 to .90) across 7 administrations. However, the 2 social anxiety items demonstrated poor-to-acceptable internal

consistency as a composite measure, with Cronbach's *alphas* from .31 to .81. Likewise, a composite of defusion from associated cognitions demonstrated a range of reliabilities, from poor to very good (.59 to .87). Hence, the overall/general DDS was analyzed as a composite scale but all items examining defusion from two aspects of SA experience and three types of core beliefs were analysed individually.

2.4 Experimental Procedures

2.4.1 Overview. Please see the Timeline (Appendix A) for a visual representation of procedure sequencing.

2.4.2 Imagery rescripting intervention. In the present study, IR was administered as a single-session intervention based on published guidelines from prior research (Arntz & Weertman, 1999, Wild et al., 2007 & 2008). Here, as in Nilsson, Lundh, and Viborg (2012), cognitive restructuring (CR) exercises were *not* included as part of the IR protocol. Using the information obtained from the WIMI and ACS, the experimenter-therapist (SGR) conducted a three-phase 'rescripting' of imagery pertaining to a specific event in memory – in this case, the memory associated with the content of recurrent negative imagery. In preparation, the participant is informed that the experimenter-therapist will be turned slightly away from them and, thus, is encouraged not to have to maintain eye contact with the therapist during the imagery procedures. Participants are instructed either to close their eyes or gaze towards the floor. In phase 1, participants are asked to recount the memory from the point of view of their self *at the time of the event* (i.e., the "prior self"). The participant is then directed (and, if necessary, reminded) to describe the scene in detail using the first person (e.g., "I am standing at the front of the class"), conveying as much detail as they can recall, including characteristics of the environment, others present, and their own feelings and thoughts, as well as the sequence of events. Once this is

complete, phase 2 begins, in which the participant observes the *scene from the perspective of the current self* (i.e., the “current self”). In other words, they are asked to observe the scene as they would if they witnessed it as a bystander today. Participants are instructed to begin (or, in some cases, they spontaneously begin) to participate in the scene as their current self, doing whatever they feel needs to be done to make the outcome of the event “more positive or satisfying” for the prior self. These interventions may be interactive between prior and present self (e.g., “I look myself in the eyes and say, ‘Don’t worry if you screwed up. You’re a great kid. This event means nothing in the big picture and you’re going to go on to do so much with your life!’”), or between the past or present self and others in the scene (e.g., confronting a bully or a critical parent). The participant intervenes in the scene until the negative valence of the event has transformed and/or dissipated to the satisfaction of both the current and prior self. In phase 3, the participant once again assumes the perspective of the prior self during the event and recounts the event again in the first person, this time incorporating the new content from phase 2. Finally, the researcher-therapist asks whether there is “anything more that the prior self would like from the current self, or to see changed in the event.” If there is, then participants are encouraged to enact this in the scene until they achieve a sense of satisfaction or completion. Once phase 3 has been completed, the researcher-therapist lets the participant know that the intervention is finished, acknowledges the participant’s hard work, and encourages the participant to take a few moments to “come back” into the present. Please see Appendix M for the scripted IR protocol that was implemented with participants.

After the intervention was completed, participants were reminded of the image and embedded meanings they previously reported in session 2 on the ACS and were asked if, based on what they experienced/saw/learned during IR, they would alter or revise their original

cognitions about self, others, and the world, as recorded on the original IMC Summary Sheet, in any way. If the participant responded in the affirmative, the revised cognition was recorded on the Revised IMC Summary Sheet (see Appendix N).

3.0 Results

3.1 Preliminary Analyses

3.1.1 Descriptive statistics. Sample characteristics are summarized in Table 1. The average age of the participants was 19.52 (range = 18-22). Seventy percent of the sample was female and participants reported that they were from a variety of ethnic backgrounds (42% white/European, 30% Chinese, 18% other Asian, 4% black/Caribbean, and 4% Middle Eastern). As indicated in Table 1, chi-square tests and *t*-tests comparing distribution/values of descriptive variables across the two conditions (treatment and waitlist control) at the time of initial assessment revealed no significant differences.

3.1.2 Change prior to IR. To evaluate whether symptom change occurred as a result of the image, memory, and core cognitions assessment, symptom ratings taken at initial intake were compared with symptom ratings following the WIMI and ACS. As expected, paired sample *t*-tests showed no significant differences between these time points on strength of SAD (on the SPIN, $p = .294$; on the LSAS, $p = .703$) and depression (on the DASS_D, $p = .289$).*Efficacy of IR*

As the first step in extending knowledge in the field regarding IR in the treatment of SAD, the efficacy of IR as a stand-alone, single-session intervention was examined, with symptoms on measures of SA (SPIN, LSAS-SR) and depression (DASS) as the primary dependent variables. A series of 2x3 repeated-measures (RM) ANOVAs were conducted, comparing no treatment (WL; $n = 12-13$) with active treatment (IR; $n = 13-14$) at pre-treatment (Pre-IR), post-treatment (Post-IR)/first waitlist questionnaire set (WL1), and one week followup (FU1)/second waitlist questionnaire set (WL2) time points.

3.2 Efficacy of IR

3.2.1 Changes in SA symptoms. At the omnibus level, there was a main effect of Time, $F(2, 44) = 7.13, p = .002, \eta^2_p = .25$, and a significant Time x Condition interaction, $F(2, 44) = 10.27, p < .001, \eta^2_p = .32$, for scores on the SPIN across the relevant time points. To follow up, change scores were computed by subtracting scores from target time points (i.e., post-IR and FU1 in the IR group, and WL1 and WL2 in the WL group) from pre-treatment scores, and independent-sample *t*-tests were conducted, comparing change scores across conditions⁶. These tests indicated significant group differences in the expected direction, with changes across time significantly greater in the IR relative to the WL condition from the pre-IR to post-IR/WL1 time points, $t(24) = 2.69, p = .013$; Cohen's $d = 1.10$, and from the pre-IR to FU1/WL2 time points, $t(23) = 4.40, p < .001$; Cohen's $d = 1.84$. A comparison of change from post-IR to FU1 in the IR condition with change from WL1 to WL2 in the WL condition (matched time intervals between the groups) showed a marginal difference that trended toward significance, $t(23) = 1.89, p = .071$.

Changes in SA symptoms measured using the LSAS-SR, followed a similar, though not identical, pattern. The omnibus RM ANOVA showed a main effect of Time, $F(1.591, 35.002) = 11.45, p < .001, \eta^2_p = .34$ using Greenhouse-Geisser corrected scores because the assumption of sphericity was violated, and a significant Time x Condition interaction, $F(1.591, 35.002) = 5.38, p = .008, \eta^2_p = .20$ (Greenhouse-Geisser corrected), for scores on the LSAS-SR across the relevant time points. As above, change scores were computed and independent-sample *t*-tests were used to compare magnitude of change across conditions. Results indicated that changes from pre-IR to post-IR/WL1 time points were not significantly different across conditions ($p = .271$) but scores were significantly decreased from pre-IR to FU1/WL2 in the IR group compared

to the WL group, $t(23) = 2.92, p = .008$; Cohen's $d = 1.22$ (see Table 2 for means and standard deviations). There was no significant difference when comparing change on the LSAS from post-IR to FU1 in the IR condition and WL1 to WL2 in the WL condition ($p = .318$).

3.2.2 Changes in depression symptoms. The same series of analyses reported above was repeated using the DASS Depression subscale as the outcome variable. Omnibus results were nonsignificant for both the main effects of Time and the Time x Condition interaction. However, *a priori* hypotheses prompted us to complete independent-samples *t*-tests to compare change, and these showed a significant difference between change scores across the two conditions from pre-IR to post-IR, $t(20) = 2.36, p < .028$; Cohen's $d = 1.06$, with larger change scores in the IR relative to the WL condition. This difference was no longer significant when pre-treatment to follow-up change scores were compared across conditions ($p = .174$), and change scores were not significantly different between post-IR and FU1 within the IR group and between WL1 and WL2 within the WL group ($p = .513$).

3.3 Change processes during IR

To further extend our understanding of IR and test specific hypotheses about the effects of IR over time on a variety of dependent variables, we conducted within-subjects repeated-measures ANOVAs to examine changes over time reported by the full sample of participants who underwent IR (ns from 16 - 24; lower ns are present in the core beliefs categories, as not all participants endorsed core beliefs about others or the world related to the image/memory). For these analyses, we included data from the participants who had initially been assigned to WL but later received IR, as well as those who were assigned to IR immediately. To justify merging these data into one set, we first inspected independent-samples *t*-tests comparing changes from pre-IR assessment to post-IR for all dependent variables between the two groups, which

indicated that they were statistically equivalent, with $t_s \leq 1.12$ and $p_s \geq .275$ (with the exception of significant changes in acceptance towards self in the memory, $t(21) = 2.51$, $p = .02$, and marginally significant changes in forgiveness of self, $t(21) = 1.76$, $p = .093$).

Data from pre-IR, post-IR, FU1 and FU2 time points were merged from the two groups and used for within-subjects analyses. Dependent variables included participants' subjective ratings across the *Image Items*, *Memory Items*, *Associated Cognition Items*, and the DDS. Time points for these analyses included pre-treatment (pre-IR), post-treatment (post-IR), one-week followup (FU1), and one-month followup (FU2). Where omnibus effects were significant, or trended towards significance (i.e., $p < .10$), followup t -tests were used to identify the specific time points across which significant changes occurred.

In addition to these within-subject RM ANOVAs, between-subjects tests were computed in order to compare the treatment group's post-IR scores with those of the waitlist group's at the matched time point (WL1); below, this time point is abbreviated as "post-IR/WL1."

3.3.1 Changes to core beliefs. Of the 27 participants who completed IR, 27 (100%) identified a negative core belief about the self (CBS) associated with the image/memory; 25 (93%) also identified a negative core belief about others (CBO), and 22 (82%) identified a negative core belief about the world (CBW). Following IR, 25/27 (93%) CBSs, 23/24 (96%) CBOs, and 22/22 (100%) had been altered. See Table 3 for a list of the participants' reported associated cognitions at both pre- and post-IR, and Figure 6 for an illustration of the changes to strength of original and updated core beliefs over the course of the study.

Analyses revealed that participants' ratings of the strength (on a scale of 0-100) of their negative core beliefs about self (CBS), others (CBO), and the world (CBW) associated with their images and corresponding memories all decreased significantly with IR. Specifically, for CBS,

the omnibus RM ANOVA was significant, $F(1.916, 38.329) = 10.00, p < .001, \eta^2_p = .33$ (Greenhouse-Geisser corrected), and followup t -tests indicated significantly lower strength of CBS from pre-IR to post-IR, $M = -25.19 (SD = 31.67), t(26) = 4.13, p < .001$, which continued to differ from pre-IR to FU1, $M = -19.09 (SD = 24.09), t(21) = 3.72, p = .001$, and FU2, $M = -18.00 (SD = 29.16), t(24) = 3.09, p = .005$. In term of the maintenance of CBS changes, “rebound” of symptoms was marginally significant from post-IR to FU1, $M = 9.09 (SD = 24.09), t(21) = 1.59, p = .09$; however, strength of CBS did not differ at FU1 and FU2 ($p = .499$), indicating that whatever gains were maintained by 1-week FU carried over through the following weeks without significant rebound. However, a comparison of scores from post-IR to FU2 indicated that rebound was significant at 1-month followup relative to post-treatment, $M = 7.29 (SD = 17.21), t(24) = 2.09, p = .047$. A between-subjects comparison of the mean strength of CBS in the IR vs. WL conditions at post-IR/WL1 indicated significant differences in the expected direction, with the WL group reporting greater strength of CBS ($M=67.69, SD=29.76$) than the treatment group ($M=43.57, SD=26.49$), $t(25)=2.22, p = .035$.

For CBO, the omnibus RM ANOVA was significant, $F(1.900, 36.092) = 13.19, p < .001, \eta^2_p = .41$ (Greenhouse-Geisser corrected), and followup t -tests indicated significantly lower strength of CBO from pre-IR to post-IR, $M = -27.92 (SD = 29.19), t(23) = 4.69, p < .001$, which continued to differ from pre-IR to FU1, $M = -27.14 (SD = 19.79), t(20) = 3.72, p < .001$, and FU2, $M = -19.55 (SD = 29.68), t(21) = 3.09, p = .006$. Examining maintenance of changes at post-IR, there was no significant change from post-IR to FU1 ($p = .426$) or from FU1 to FU2 ($p = .225$), but there was marginally significant rebound across the full month, post-IR to FU2, $M = 7.73 (SD = 17.71), t(21) = 2.05, p = .053$. Comparing mean strength of CBOs between the two conditions at post-IR/WL1 revealed, as expected, that the WL group reported greater strength of

CBO ($M=66.36$, $SD=23.36$) than the treatment group ($M=48.46$, $SD=15.73$), $t(22)=2.23$, $p=.036$).

Finally, the omnibus RM ANOVA examining changes to CBW was significant, $F(1.996, 29.944) = 5.36$, $p = .01$, $\eta^2_p = .26$ (Greenhouse-Geisser corrected), with followup t -tests showing that significant decrease to strength of CBW occurred from pre-IR to post-IR, $M = -24.29$ ($SD = 35.86$), $t(20) = 3.10$, $p = .006$, and differed from pre-IR to FU1, $M = -20.00$ ($SD = 25.44$), $t(17) = 3.34$, $p = .004$, but not from pre-IR to FU2, $M = -11.91$ ($SD = 37.63$), $t(20) = 1.45$, $p = .163$. Changes achieved at post-IR did not rebound significantly at FU1 ($p = .23$), and gains evident at FU1 were well-maintained until FU2 (comparing the two, $p = .722$). However, directly comparing scores immediately following intervention and at 1-month followup revealed a trend toward rebound from post-IR to FU2, $M = 9.47$ ($SD = 24.60$), $t(18) = 1.68$, $p = .11$. As expected, a t -test comparing strength of CBW between the two groups at post-IR/WL1 was significant, with stronger CBW in the WL condition ($M=76.00$, $SD=22.21$) than in the treatment condition ($M=53.64$, $SD=18.04$), $t(19)=2.54$, $p = .020$

3.3.2 Changes in perceived powerlessness and empowerment of self. Perceived powerlessness of the self in the memory decreased significantly overall, omnibus RM ANOVA $F(1.994, 41.880) = 14.54$, $p < .001$, $\eta^2_p = .41$ (Greenhouse-Geisser corrected). Followup t -tests showed that powerlessness decreased significantly from pre-IR to post-IR, $M = -1.52$ ($SD = 1.34$), $t(26) = 5.89$, $p < .001$, and continued to differ significantly from pre-IR at both followup sessions, $M = -1.78$ ($SD = 1.45$), $t(22) = 5.92$, $p < .001$; and $M = -1.58$ ($SD = 1.72$), $t(23) = 4.52$, $p < .001$, for FU1 and FU2, respectively. This change was maintained without significant rebound from post-IR to both followup time points ($ps = .365$ and 1.00 for FU1 and FU2, respectively) and from FU1 to FU2 ($p = .204$). However, between-groups comparisons at post-

IR/WL revealed that the effect of IR on participants' ratings of self-powerlessness were not significantly different from that of WL ($p = .132$).

Perceived empowerment of the self when reflecting on the memory increased significantly, with good maintenance of gains. The omnibus RM ANOVA was significant, $F(3, 63) = 6.74, p = .001, \eta^2_p = .24$, and followup t -tests showed that the sense of powerlessness decreased significantly from pre-IR to post-IR, $M = 1.30 (SD = 1.49), t(26) = 4.24, p < .001$, and continued to differ significantly from pre-IR at both followup sessions, $M = 0.87 (SD = 1.42), t(22) = 2.93, p = .008$; and $M = 0.83 (SD = 1.61), t(23) = 2.54, p < .018$, for FU1 and FU2, respectively. There was marginal rebound following intervention, with some decrease evident by FU1, $M = 0.48 (SD = 1.20), t(22) = 1.91, p = .069$, and FU2, $M = 0.58 (SD = 1.47), t(23) = 1.94, p = .065$. Gains maintained at 1-week FU did not decrease further at 1-month FU ($p = .648$). An independent-samples t -test comparing the effects of the control ($M=1.58, SD=1.00$) vs. treatment ($M=3.00, SD=1.11$) conditions on self-empowerment ratings at post-IR/WL showed that they differed significantly in the expected direction, $t(24)=3.40, p = .002$.

3.3.4 Changes in differentiation of self. Differentiation of prior and current selves, measured individually, showed marginal-to-significant change during IR, but little maintenance of these gains at the followup time points. Ratings of how much participants 'identified' with their younger self who was the subject trended towards decreasing (RM ANOVA $F(3, 63) = 2.27, p = .089, \eta^2_p = .10$). The inverse item – i.e., no longer identifying with that prior self – showed significant change, omnibus RM ANOVA $F(3, 63) = 2.80, p = .047, \eta^2_p = .11$. Followup t -tests showed significant differences between pre-IR and post-IR, $M = 0.74 (SD = 1.53), t(26) = 2.51, p = .019$, and from post-IR to FU1, $M = 0.65 (SD = 1.34), t(22) = 2.34, p = .029$. There was no difference between scores at pre-IR and FU1 ($p = .458$), pre-IR and FU2 ($p = .685$), or FU1

and FU2 ($p = .866$). However, between-groups comparisons at post-IR/WL revealed that the effect of IR on participants' ratings of self-differentiation were not significantly different from that of WL ($ps = .949$ and $.454$, for these two items, respectively).

3.3.5 Changes in compassion, forgiveness, and acceptance. Compassion, forgiveness, and acceptance toward the self in the target memory all increased with IR. Repeated measures ANOVAs and followup *t*-tests were used to examine changes in these variables. As summarized in Table 4a, increases in compassion towards the self trended toward being significant at the omnibus level; while gains were not maintained at followups, self-compassion increased significantly immediately post-IR. Forgiveness and acceptance towards the self both increased significantly from pre- to post-IR and these gains were largely maintained, although some rebound was evident. Followup *t*-tests showed significant increases from pre- to post-IR and continued differences from pre-IR to both FU1 and FU2, with no decrease from FU1 to FU2. Comparing means from post-intervention with both followups, some rebound from initial gains was evident. Examining comparisons between conditions using independent-samples *t*-tests revealed that participants who had received IR showed increased compassion, forgiveness, and acceptance towards the self in the memory compared to those on the waitlist (see Table 4b).

Similarly, compassion, forgiveness, and acceptance toward *others* who were part of the memory increased significantly during the study. Change in compassion towards others was maintained without significant rebound at either followup, while changes forgiveness and acceptance towards others had some rebound from post-IR at 1-week and 1-month followups, as outlined in Table 4a. *T*-tests comparing means between conditions showed that, compared to WL, those who received IR had significantly higher compassion and acceptance, and marginally higher forgiveness, toward others in the memory (see Table 4b).

3.3.6 *Changes in defusion.* Propensity to ‘defuse’ from one’s negative emotions was hypothesized to increase as a result of IR. Three categories of internal experience were examined: general/overall defusion (spanning a variety of negative internal experiences), as measured by the DDS, defusion from social anxiety-relevant internal experience, as measured by the two supplemental items of the DDS, and defusion from negative core beliefs associated with target image/memory (three additional items generated for the current study).

General/overall defusion (10 items, rated on a scale of 0-5, for a total range of 0-50) increased over the course of the study, as indicated by the outcomes of the omnibus RM ANOVA, $F(3, 60) = 9.09, p < .001, \eta^2_p = .31$. Followup t -tests revealed that significant change occurred from pre-IR to post-IR, $M = 7.27 (SD = 9.22), t(25) = 4.02, p < .001$, and continued to differ from pre-IR at FU1, $M = 3.44 (SD = 4.80), t(22) = 4.33, p = .002$, and FU2, $M = 5.76 (SD = 7.91), t(24) = 3.64, p = .001$. There was some rebound from post-IR to FU1, $M = -3.91 (SD = 6.77), t(21) = 2.71, p = .013$, but significant increase again between FU1 and FU2, $M = 2.36 (SD = 5.02), t(21) = 2.21, p = .038$. Gains were maintained from post-IR to FU2 ($p = .195$). An independent-samples t -test comparing means for the control ($M=24.23, SD=7.07$) and treatment ($M=29.23, SD=6.42$) conditions indicated a marginal difference at post-IR/WL1, $t(24)=1.89, p = .071$.

The item measuring defusion that was specific to concerns about being in a group social setting changed over the course of the study, omnibus RM ANOVA, $F(3, 66) = 2.22, p = .094, \eta^2_p = .09$. Followup t -tests indicated that significant change occurred from pre-IR to post-IR, $M = 0.77 (SD = 1.48), t(25) = 2.65, p = .014$, but from post-IR to FU1 there was marginally significant rebound, $M = -0.50 (SD = 1.32), t(23)=1.86, p = .076$. While FU1 and FU2 ratings did not differ significantly ($p = .377$), FU2 scores showed some recovery from the initial rebound, as

they were not significantly different from scores at post-IR ($p = .364$), and were significantly higher than pre-IR ratings ($M = 0.64$, $SD = 1.41$, $t(24)2.27$, $p = .033$). An independent-samples t -test comparing the two conditions at post-IR/WL demonstrated a significant difference in defusion from anxiety concerns related to group social settings, $t(24)=2.34$, $p = .028$, with mean defusion ratings for the control condition ($M=2.46$, $SD=0.97$) significantly lower than in the active treatment condition ($M=3.39$, $SD=1.04$).

The item measuring defusion from anxiety related to one-on-one interactions also increased during the study, omnibus RM ANOVA, $F(3, 66) = 4.31$, $p = .008$, $\eta^2_p = .16$. Followup t -tests indicated that significant change occurred from pre-IR to post-IR, $M = 0.96$ ($SD = 1.56$), $t(25) = 3.14$, $p = .004$, but that this change was not maintained from post-IR to FU1 ($p = .144$) and that FU1 did not differ from FU2 ($p = .328$). However, by 1-month FU (FU2), defusion from concerns related to individual interactions had returned again to being significantly increased relative to pre-IR levels ($M = 0.60$, $SD = 1.35$, $t(24) 2.22$, $p = .036$) and not significantly different from either post-IR ($p = .153$) or FU1 ($p = .328$). An independent-samples t -test comparing the two conditions at post-IR/WL demonstrated a significant difference in defusion from anxiety concerns related to one-on-one interactions, $t(24)=2.30$, $p = .030$, with mean defusion ratings for the control condition ($M=2.15$, $SD=1.28$) significantly lower than in the active treatment condition ($M=3.15$, $SD=0.90$).

Finally, I examined changes to defusion from idiosyncratic core beliefs (measured on a scale of 0-5 for each item individually) over the course of participation. Defusion from core beliefs about self (CBS) increased over the course of the study, omnibus RM ANOVA, $F(3, 63) = 7.97$, $p < .001$, $\eta^2_p = .28$. Followup t -tests showed significant increases from pre-IR to post-IR, $M = 4.25$ ($SD = 4.42$), $t(19) = 4.30$, $p < .001$, from pre-IR to FU1, $M = 2.17$ ($SD = 3.09$), $t(17) =$

2.97, $p = .009$, and from pre-IR to FU2, $M = 3.50$ ($SD = 4.53$), $t(21) = 3.62$, $p = .002$. There was significant rebound from post-IR to FU1, $M = -0.73$ ($SD = 1.16$), $t(21) = 2.94$, $p = .008$, and FU1 did not differ from FU2 ($p = .126$), while at FU2, scores did not differ significantly from post-IR ($p = .116$). An independent-samples t -test revealed that at post-IR/WL1, participants who had received IR ($M=3.15$, $SD=1.28$) reported significantly greater defusion from CBS than those who were randomized to WL ($M=2.08$, $SD=1.19$), $t(24)=2.22$, $p = .036$.

Likewise, defusion from core beliefs about others (CBO) showed change over the course of participation, omnibus RM ANOVA, $F(3, 57) = 3.36$, $p=.025$, $\eta^2_p = .15$. Followup t -tests showed significant increases from pre-IR to post-IR, $M = 1.18$ ($SD = 1.65$), $t(21) = 3.36$, $p = .003$, but non-significant change from pre-IR to FU1 ($p = .009$) and a marginal difference between pre-IR and FU2, $M = 0.73$ ($SD = 1.91$), $t(21) = 1.79$, $p = .088$. There was significant rebound from post-IR to FU1, $M = -0.65$ ($SD = 1.31$), $t(19) = 2.22$, $p = .039$ and ratings did not change significantly from FU1 to FU2 ($p = .309$); at FU2, scores did not differ significantly from post-IR ($p = .204$). For this measure, an independent-samples t -test revealed no significant difference between conditions at the post-IR/WL1 time points ($p = .261$)

Defusion from core beliefs about the world (CBW) also changed, omnibus RM ANOVA, $F(3, 48) = 6.24$, $p=.001$, $\eta^2_p = .28$. Followup t -tests showed significant increases from pre-IR to post-IR, $M = 1.45$ ($SD = 1.85$), $t(19) = 3.51$, $p = .002$, and from pre-IR to FU1, $M = 0.94$ ($SD = 1.47$), $t(17) = 2.72$, $p = .015$, and from pre-IR to FU2, $M = 0.95$ ($SD = 1.47$), $t(19) = 2.89$, $p = .009$, but not from FU1 to FU2 ($p = .579$). Participants who had received IR ($M=1.70$, $SD=1.06$) reported significantly greater defusion from core beliefs about the world than participants on the WL ($M=2.08$, $SD=1.19$) at the comparable time point, $t(19) = 2.95$, $p = .008$.

3.3.7 *Changes in imagery qualities.* Changes in imagery characteristics/qualities were not rated immediately following the intervention, but at pre-treatment and again at the two followup sessions, as described in the Measures section, above. Thus, no between-subjects tests were conducted on these variables. Ratings of how real the image seemed (on a scale from 1-5) decreased over the course of the study, Omnibus RM ANOVA, $F(2, 46) = 4.48, p = .020, \eta^2_p = .16$. Within-subjects *t*-tests examining changes from pre-IR to each of the followup sessions showed significant decreases at FU1, $M = -.64 (SD = 1.29), t(24) = 2.49, p = .020$, and continuing, although marginal, changes from pre-IR to FU2, $M = -.60 (SD = 1.56), t(24) = 1.93, p = .066$. There was no significant rebound from FU1 to FU2 ($p = .704$).

Analyses indicated, further, that participants' ability to manipulate contents of the image (single item, scaled from 1-5) increased over the course of the study, Omnibus RM ANOVA, $F(2, 46) = 4.26, p = .017, \eta^2_p = .16$. Within-subjects *t*-tests comparing pre-IR to each of the followup sessions showed significant increases from pre-IR to FU1, $M = .84 (SD = 1.34), t(24) = 3.13, p = .005$, and from pre-IR to FU2, $M = .76 (SD = 1.72), t(24) = 2.22, p = .036$. There was no significant rebound from FU1 to FU2 ($p = .461$).

Participants also rated their embarrassment and shame about the aspects of the self that were represented in the image (on a scale from 1-5). These scores decreased significantly during the study, omnibus RM ANOVA, $F(2, 46) = 12.95, p < .001, \eta^2_p = .36$. Within-subjects *t*-tests comparing pre-IR to each of the followup sessions showed that shame and embarrassment represented in the image decreased at FU1, compared to pre-IR, $M = -1.16 (SD = .90), t(24) = 6.46, p < .001$, and these changes remained significant from pre-IR to FU2, $M = -.84 (SD = 1.43), t(24) = 2.93, p = .007$. Change was maintained from FU1 to FU2, with no significant rebound ($p = .664$).

Finally, among hypothesized changes to imagery qualities as a result of IR, we examined the extent to which participants perceived the image to influence their perception of self, others, and the world (on a scale from 1-5). Perception of self in relation to the image changed significantly during the study, omnibus RM ANOVA, $F(2, 46) = 7.41, p = .002, \eta^2_p = .24$. Followup *t*-tests comparing scores at pre-IR versus FU1 and FU2 showed that influence on self-perception decreased significantly from pre-IR at both FU1, $M = -.88 (SD = 1.30), t(24) = 3.38, p = .002$, and FU2, $M = -.76 (SD = 1.23), t(24) = 3.08, p = .005$. Change was maintained from FU1 to FU2, as there was no significant difference between scores at these time points. ($p = .870$).

Changes in the extent to which the image influenced participants' views of others were marginally significant, omnibus RM ANOVA, $F(1.558, 35.825) = 3.43, p = .058, \eta^2_p = .13$ (Greenhouse-Geisser corrected). Followup paired-samples *t*-tests comparing scores at pre-IR with FU1 and FU2 showed marginal decrease from pre-IR to both FU1, $M = -.48 (SD = 1.42), t(24) = 1.69, p = .103$, and FU2, $M = -.56 (SD = 1.53), t(24) = 1.83, p = .080$. This marginal change was maintained from FU1 to FU2, as there was no significant difference between scores at these time points ($p = .260$). The extent to which imagery influenced participants' views of the world in general did not change over the course of the study (omnibus RM ANOVA, $p = .179$).

3.3.8 Changes in memory qualities. It was hypothesized that changes to the affective qualities of the target memory might occur with IR. Participant ratings of anxiety evoked by the memory (measured on a scale of 1-5) decreased significantly over the course of the study, omnibus RM ANOVA, $F(3, 60) = 18.26, p < .001, \eta^2_p = .48$. Followup *t*-tests were performed to identify where the differences occurred. These tests showed significant decreases in anxiety associated with the memory from pre-IR to post-IR, $M = -1.39 (SD = 1.17), t(25) = 6.04, p < .001$, and continued differences from pre-IR to FU1, $M = -1.65 (SD = 1.07), t(22) = 7.40, p < .001$.

.001, and FU2, $M = -1.63$ ($SD = 1.28$), $t(23) = 6.22$, $p < .001$. There was no significant rebound from post-IR to FU1 ($p = .246$), or from FU1 to FU2 ($p = .840$), nor was there a significant change between post-IR and FU2 ($p = .342$). However, a between-subjects comparison revealed no significant difference in how much anxiety was evoked by the memory across the two conditions at post-IR (treatment group) and WL1 (control group), $p = .588$.

A single-item rating of global negative emotion associated with the target memory were made by participants at the relevant time points (using a scale of 1-5 to rate the statement, “While remembering the event, the emotions I felt were negative.”), and analyses showed significant decreases across the course of the study, omnibus RM ANOVA, $F(3, 60) = 16.87$, $p < .001$, $\eta^2_p = .46$. Followup t -tests showed that significant decreases occurred from pre-IR to post-IR, $M = -1.67$ ($SD = 1.36$), $t(26) = 6.37$, $p < .001$, and continued to change relative to pre-IR at both FU1, $M = -1.70$ ($SD = 1.30$), $t(22) = 6.28$, $p < .001$, and FU2, $M = -1.96$ ($SD = 1.15$), $t(22) = 8.18$, $p < .001$. There was no significant rebound from post-IR to FU1 ($p = 1.00$) or FU2 ($p = .266$). Between-subjects t -tests revealed that control participants reported that significantly higher negative emotion was evoked by the memory at post-IR/WL1, ($M=4.08$, $SD=1.08$) than those in the treatment condition ($M=2.64$, $SD=1.15$), $t(24)=3.27$, $p = .003$.

Participants also rated the intensity of emotion associated with the memory (on a scale from 1-5); here, too, significant decreases were evident across the study, omnibus $F(3, 60) = 8.61$, $p < .01$, $\eta^2_p = .30$. Followup t -tests showed marginal decreases in ratings of negative affect from pre-IR to post-IR, $M = -.52$ ($SD = 1.53$), $t(26) = 1.76$, $p = .09$, and continued differences from pre-IR at FU1, $M = -1.17$ ($SD = 1.27$), $t(22) = 4.44$, $p < .01$, and FU2, $M = -1.00$ ($SD = 1.21$), $t(22) = 3.98$, $p < .01$. There was marginal rebound from post-IR to both FU1 and FU2, $M = .39$ ($SD = 1.08$), $t(22) = 1.74$, $p = .095$ and $M = .48$ ($SD = 1.12$), $t(22) = 2.04$, $p = .053$,

respectively, although ratings at FU1 and FU2 did not differ significantly from one another ($p = .329$). Despite these within-groups analyses showing decreased intensity of emotion evoked by the memory, a between-subjects comparison revealed a nonsignificant difference in emotion intensity between participants assigned to IR and those assigned to WL at post-IR/WL1 ($p = .169$).

3.4 Mechanisms of Treatment Efficacy

To examine which of our process variables may be most related to symptom changes that occurred as a result of IR, and with an eye toward developing future hypothesis-driven studies that would be designed in a manner that could measure treatment mediators in IR, we ran a series of correlations between symptom change scores (on the SPIN) from intake to one week followup and change scores from pre-treatment to post-treatment on our component process variables (strength of core beliefs about self, others, and the world; compassion, forgiveness, and acceptance towards self, and towards others, in the target memory; defusion generally, related to SAD, and from core beliefs; perceived empowerment in the memory; differentiation of historical and current selves; qualities of the image; and qualities of the memory)⁷. No specific hypotheses were advanced.

Findings are summarized in Table 5, in which Pearson's r s are reported for correlations between variables with normal distributions and Spearman's ρ s are reported for correlations where normality assumptions were violated for either of the variables. Strength of negative core beliefs about Self, Others, and the World all decreased during IR (see above), but changes in CBS uniquely demonstrated a strong positive correlation with changes in SPIN symptoms, $r(21) = .52, p = .012$. Conversely, changes in CBOs and CBWs were not significantly associated with symptom change during IR, $r_s(19) = .20, p = .384$; and $r(15) = -.02, p = .942$, respectively.

In a similar vein, we explored whether changes to compassion, forgiveness, and acceptance in the target memory predicted symptom change. Indeed, changes in the self-related variables were associated with SA symptom changes, with compassion, $r(20) = -.50, p=.019$), forgiveness, $r(20) = -.46, p < .030$), and acceptance, $r(20) = -.36, p=.098$, all correlating substantially with symptom change (although the correlation with acceptance toward self only trended towards being significant). In contrast, the changes in strength of compassion, forgiveness, and acceptance towards others in the memory did not predict symptom change, $r(20) = -.07, p = .76$; $r(20) = .14, p = .54$; and $r(20) = -.18, p = .41$, respectively.

We explored the remainder of the relevant outcome variables as possible predictors of symptom change. Of the following, none significantly predicted decreases in SPIN scores (with the exception of defusion from SAD concerns pertaining to one-on-one social contexts and identification with prior self; as shown in Table 5): image qualities (how real it seemed, participants' abilities to change aspects of the image, how much it represented of negative aspects of self, influenced participants' views of self, caused mood to worsen, and how much participants could control influence of image on mood), memory qualities (sense of empowerment of the self in the memory, extent of differentiation between current and prior self in memory, intensity of emotion elicited by memory, extent of anxiety elicited by memory), defusion (in general, from SAD-relevant cognitions, and from core beliefs).

4.0 Discussion

4.1 Efficacy of Imagery Rescripting: Symptom Reduction

This study examined a single-session IR intervention for treating social anxiety. The first set of analyses tested my primary hypotheses that immediately following the intervention and at 1-week and 1-month followups, IR would lead to significant decreases in symptoms of social anxiety (see Figure 1) and depression compared to pre-intervention, and that IR would significantly outperform WL at post-intervention and 1-week followup. Results from between-subjects analyses demonstrated that participants in the active treatment condition experienced reduced SA symptoms in comparison to participants in the WLcontrol condition. These effects were evident immediately following intervention on one measure (the SPIN) but not the other (the LSAS-SR); large effects, however, were evident across both measures at 1-week followup, and within-subjects analyses showed maintenance of gains at 1-month (between-subjects comparisons were not available for the longer followup time point). These results support earlier findings that IR is generally efficacious in reducing SA symptoms, over and above passage of time or inclusion in a treatment study after 1 week (Lee & Kwon, 2013; Nilsson et al., 2012; Wild et al., 2008). Adding to these previous findings, the 1-month followup in the present study demonstrated, for the first time in the literature, that gains in treating SA symptoms made through IR alone are very well-maintained.

Many participants in this study conveyed that they had gained new insight into their ongoing anxiety when they identified the autobiographical source of recurrent imagery, as well as the nature and meaning of such impactful autobiographical memory (from the WIMI and the ACS). However, given that there was no significant difference in self-reported symptoms of SA or depression following those activities, it seems that insight alone into the underlying memory

and corresponding meaning does not, in and of itself, facilitate symptom change. This insight regarding the contents of relevant imagery, cognitions, and memory, and their interconnected influence on anxiety activation makes it possible to individualize the model of anxiety depicted in Figure 2. Creating such an idiosyncratic model may be a helpful platform for change, and, following from Figure 2, targeting change within the idiosyncratic memory content “upstream” from beliefs and assumptions is what leads to the changes to beliefs and assumptions and reduces symptoms.

Depression symptoms were reduced immediately following IR relative to WL, but this difference was not consistently maintained when inspected more carefully over time both between conditions and even within the IR condition. One interpretation of this finding is that the effects of IR are quite specific to SAD-relevant content, as we see substantial change in SAD symptoms as a result of IR, but little change in depression symptoms (despite depression often being comorbid with SAD; e.g., Stein, Fuetsch, Müller, Höfler, Lieb, & Wittchen, 2001). It is also possible that the magnitude of impact on SAD symptoms would need to be greater, or experienced for a longer amount of time, before symptoms of depression would effectively decrease. However, given that relatively few participants in the sample endorsed clinically significant levels of depression, the question of impact of decreases to SAD on depression might better be addressed in a sample with higher rates of depression prior to treatment.

4.2 Effects of Imagery Rescripting on Specific Therapeutic Factors

4.2.1 Changes in negative core beliefs. I proposed that core beliefs associated with the target imagery and memory would be altered and/or decreased in strength after IR. As for alterations to core beliefs, I hypothesized that the *content* of the target negative cognitions would be revised following IR in a manner that assimilates new information derived from the

intervention. Indeed, a very high proportion of negative core beliefs identified prior to intervention, which were related to the recurrent image and memory, were revised following IR, suggesting that IR is an effective technique for helping clients make changes to deeply held cognitions that are often resistant to change (e.g., Beck, 2006; Padesky & Greenberger, 1995; Wenzel, 2012). I also hypothesized that, in addition to altering the content of original core beliefs associated with the memory and image, the strength with which participants held the original core beliefs would decrease; that is, that the original negative beliefs would be held with much less conviction than they had been prior to IR. These hypotheses were supported, as within-subjects comparisons showed significant reductions to strength of negative core beliefs across all three domains (self, others, and the world) following IR, and between-groups comparisons showed negative core beliefs to be held with less strength in participants who had undergone IR vs. those who were randomized to the waitlist. Indeed, at 1-week and 1-month followups, strength of participants' beliefs in all three domains was significantly reduced relative to pre-treatment, notwithstanding some degree of rebound that occurred across domains. These results support the notion that IR is a powerful method for accessing, addressing, and reducing negative core beliefs across theoretically (and practically) relevant domains of self, others, and the world. This technique would likely be most beneficial, with gains maintained longer-term, if it were administered within a longer course of therapy and not as a stand-alone treatment. Within such a therapeutic context, continued solidification of gains would be optimally supported.

4.2.2 Differentiation of current and prior self. It was hypothesized that differentiation of the current self from the historical self at the time of the target memory (“prior self”) would occur as a result of IR, as the technique forces the two “selves” into focus – and even dialogue, in most cases – a process that would seem to highlight their distinctions. In this domain,

differences were evident between pre- and post-treatment scores, but not from pre-treatment scores to either of the followup time points, nor were there between-group differences in the effects of IR vs. WL on self-differentiation following the intervention or WL. A possible explanation for this finding is that the aspects of self at play in the IR experience are brought into contrast with each other not only chronologically – that is, current self as opposed to historical self – but also symbolically, at a deeper level that is imbued with personal meaning. It has been my clinical observation that subjects bring a “strong” version of their present self to the role, while the prior self – by virtue of being the subject of the traumatic social event – is a representation of the individual at their self-perceived weakest or most vulnerable. In fact, the differential strength may be a demand characteristic of the task itself, given that subjects are asked to intervene on behalf of their prior self. For example, one of my individual therapy clients (not a participant in the present study) who completed IR as part of treatment, in processing her experience of IR at a following session spontaneously referred to the *present* self as her “higher self.” Therefore, there may be dimension(s) beyond chronicity on which the two versions of the self are contrasted and which result in therapeutic gain, such as strong vs. weak, rescuer vs. victim, able to give vs. with nothing to give, etc. Furthermore, although it is seemingly useful, “creating” two entities out of one is an artificial exercise, which is done to draw out the qualities of an historical self which is contextualized by the target memory. Hence, it seems possible that while the distinction of a prior self from a current self is apparent in the context of an intervention that characterizes them as unique, the contrast between the “two selves” may become less marked with time following IR. Indeed, ongoing differentiation of chronologically distinct selves may not be particularly important to maintain gains; that is, there may not be any reason the subject should need to see his or her current self as someone different

from their earlier self. In hindsight, I have wondered if IR might exert the therapeutic effect of assimilating the current/strong/rescuing self with the prior/weak/victimized self, rather than differentiating the parts of the self per se. However, I did not measure self-assimilation in the current study and this question is one that ought to be examined in future research.

Further to the topic of differentiation, another hypothesized outcome of IR was an increase in perceived self-empowerment associated with the target memory. This hypothesis was supported, and the increase in empowerment was maintained at both followup time points within the IR condition and in the IR group relative to the WL group. While not examined in this study, it would seem relevant to understand to what extent empowerment drives the effect of differentiation. The short half-life of the differentiation of the present and prior selves within the IR condition makes sense, too, in light of the findings on compassion, forgiveness, and acceptance of the self in the memory: as the historical self is regarded with increased compassion, forgiveness, and acceptance, differentiation from that self may not be therapeutically necessary.

4.2.3 Compassion, forgiveness, and acceptance towards self and others. I hypothesized that compassion, forgiveness, and acceptance towards the self and towards others at the time of the memory would increase as a result of IR, and these hypotheses were supported. In keeping with the pattern of results thus far, participants reported increases to these variables immediately following intervention, and ratings made at both followups continued to be significantly higher than at pre-treatment. However, the effect was greatest immediately post-treatment, with some rebound occurring at the followup time points. Between-group comparisons also revealed that participants' compassion, forgiveness, and acceptance toward self and others increased significantly post-IR relative to post-WL.

When initially recalling the distressing memories, subjects often conveyed a sense of disgust, shame, disappointment, or hard-heartedness towards themselves in the memory. An important marker of the therapeutic shift during rescripting was a qualitative softening towards the prior self. In fact, for a therapist leading clients through IR, moment-by-moment judgments about whether they are engaging in the rescripting in an optimally helpful way is determined in part by an implicit or intuitive monitoring of compassion, forgiveness, and/or acceptance (as relevant to the idiosyncratic memory). In some sense, these variables could be considered mechanistic ingredients of the therapy that help to guide the therapist to individualize and customize the intervention for each subject and determine when the subject's memory is considered "resolved." This would be an important point to clarify in future research, particularly if trials include multiple therapists and/or relevant verbal content is assessed by observers.

4.2.4 Cognitive defusion. I hypothesized that IR would lead to an increase in internal distance from emotions and thoughts in general, as well as an increase in defusion with respect to participants' salient socially anxious cognitions and idiosyncratic negative core beliefs. This hypothesis was supported, as participants reported increased defusion in all of these areas, and these gains were more or less maintained at 1-week and 1-month followups. Moreover, IR participants reported significant or marginally significant benefits across many of the defusion measures relative to those assigned to WL. This set of findings is timely, in light of current interest in defusion as a central mechanism of CBT and mindfulness/acceptance approaches to anxiety treatment. It also provides some information about the cognitive processes that are implicated in IR. Specifically, reflecting on the event and experiencing the shifts of perspective that are built into IR might help subjects achieve a sense of being separate from the internal phenomena of thoughts and feelings.

4.2.5 Imagery and memory qualities. As hypothesized, IR led to changes in relevant characteristics of the target imagery. In their subjective ratings, participants who received IR reported, following the intervention, that the image seemed less real; that they were more able to change aspects of the image in their mind; that they experienced less shame or embarrassment about aspects of the self represented in the image; and that the image had less influence over how they perceived themselves, others, and the world. All of these changes, evident at 1-week followup, were maintained with no significant rebound at 1-month followup, indicating that IR was effective at making lasting and therapeutic adjustments to the imagery and its negative impact. Within-subjects changes among participants in the IR group were also evident in the affective qualities of the memory that were measured as part of the study. Participants reported decreased anxiety, negative emotion, and intensity in association with the target memory immediately following IR; as with imagery changes, these decreases were maintained at both 1-week and 1-month followups.

4.3 Mechanisms of Treatment Efficacy.

This series of analyses was exploratory, and while in hindsight the pattern of results supports my understanding of SAD, I had not entered this phase of analyses with specific hypotheses in mind. The question, here, rather than ‘which processes change as a result of IR,’ was, ‘which of the changes brought about by IR predicted reductions in SA symptoms?’ In the case of each of the hypothesized secondary outcomes reviewed above, there was some theoretical indication that the variables should be related to SA maintenance. Yet, even though all of the proposed variables were impacted by IR, it was not the case that changes in all areas were related to changes in SA symptoms, specifically. Hence, the final area of investigation of

this dissertation has implications for our understanding of SAD, over and above the findings regarding IR, per se.

As we have seen, IR results in change across numerous variables: imagery qualities change and the subjective influence of the image decreases; negative affective qualities of the target memories decrease; negative core beliefs are weakened, and revised; objective distancing from negative emotion and cognition is achieved; and compassion, acceptance, and forgiveness are increased, both towards the self and others in the traumatic memory. However, only a distinct subset of these variables correlated with symptom change: expressly self-related constructs.

4.4 Theoretical and Practical Implications

4.4.1 Centrality of the self in cognitive models of social anxiety. Imagery is afforded a central role in the cognitive behavioural theory of maintenance of SAD, in which it is purported to exert a negative impact through the explicit content of the image, which then prompts behavioural response (e.g., Hirsch et al., 2004). Hence, one would expect that changes to relevant qualities of the image, such as how real the image seems or the extent to which it portrays negative aspects of self, should influence SA symptomatology (e.g., Hirsch et al., 2006). However, outcomes from this study did not support such a model, and hence (pending replication) give us reason to revisit the nature of the impact of images and pivotal negative memories in SA. It seems that the impact of anxiety imagery is best understood as being driven by the semantic meaning about the self that is represented by it (e.g., Hackmann et al., 2000; Hackmann & Holmes, 2010), rather than by its explicit yet superficial sensory content per se. Further, the results of the present study indicate that semantic meaning most influential in SA maintenance is that which pertains to the self, rather than to beliefs about other people, or the world in general. That is, the locus of the threat underlying the anxiety is in the perceived nature

of the self, rather than an external source. Using an individual example from the present sample, changing beliefs such as “I am weak,” seems to decrease social anxiety more than correcting beliefs like “Other people are judgmental and look down on me,” or “The world is not fair.”

This set of findings lends support to Moscovitch’s (2009) model of social anxiety which identifies specific perceived flaws in the self – rather than social situations, embarrassment, or negative evaluation – as the core fear stimulus that drives symptoms. As he suggests, misidentification or misconceptualization of the core fear that underlies social anxiety and requires therapeutic attention may help to account for the relatively modest efficacy of standard CBT protocols for treating SA (e.g. Davidson et al., 2004; Stangier, Heidenreich, Peitz, Lauterbach, & Clark, 2003). Therapists who aim to reduce symptoms by targeting the explicit content in the imagery or the social context in which the imagery is imbedded, rather than the self-relevant underlying meaning that the imagery represents, may be targeting the tip of the iceberg; ultimately, it is beliefs about the self *per se* that need to change in therapy for SAD. To this end, the explicit imagery content might best be thought of as an initial access point to the underlying meaning.

4.4.2 Spontaneous vs. planned challenging of underlying cognitions. When therapists induce change in a top-down way during CBT by identifying assumptions and beliefs and challenging them based on their logical validity, it is assumed that doing so will facilitate affective change for the client. Indeed, there is good evidence that this can be helpful in improving SAD (e.g., Taylor, Woody, Koch, McLean, Paterson, & Anderson, 1997). However, while our clients tend to succeed in countering assumptions and beliefs, a disjunction between logical thought and underlying emotion – sometimes referred to as “knowing with the head but not knowing with the heart” (e.g., Barnard & Teasdale, 1991; Greenberg & Safran, 1984) – may

remain. In other words, our clients might logically know that their assumptions are incorrect but continue to *feel* as though they are true. It seems likely that the experiential nature of IR and, in particular, the spontaneous reappraisal processes that are generated by this intervention, help to bridge this “disconnection” by simultaneously activating different subsystems (e.g., Teasdale & Barnard, 1993) or structures within a broader network (e.g., Foa & Kozak, 1986). It has been my observation that once the participant becomes accustomed to the experiential nature of IR, they are able to engage multiple modalities – emotional, rational, narrative, and even sensory – in the process. In the context of this experience, many participants spontaneously recognize and challenge deep assumptions or beliefs in a more integrated manner.

In the present study, in contrast to the top-down approach of some cognitive techniques (for example, cognitive restructuring), core beliefs (CBs) were elicited prior to rescripting and then revisited at the end of the intervention. Identification and revisiting of CBs are not formal components of the rescripting itself; however, based on the experience from this study, I would recommend – for a number of reasons - that they be added to standard IR procedures, particularly if we are to consider IR a CBT technique (see below for further discussion on this topic). First, doing so serves a summarizing function for the client. In initially eliciting CBs via the image and corresponding memory, their meaning becomes explicit, their symbolism becomes more clearly defined, and their impact can be elucidated – all of which sets the stage for change. Second, in the process of rescripting, that initial meaning is altered, whether by achieving a different perspective on the initial meaning or generating new meaning altogether. At the conclusion of the rescripting, then, it is highly instructive and rewarding for clients to revisit those original beliefs and have the opportunity to revise them in light of the rescripting experience. The therapist only needs to provide some structure and coaching for this step but the

majority of subjects tend to identify revisions to content fairly readily. Finally, having knowledge of the idiosyncratic meaning encapsulated in the memory/image is helpful as the therapist guides the subject to resolution. For example, if the client does not spontaneously choose actions within the memory “scene” that address the core meanings, the therapist may guide her towards actions or reflections that do pertain to the core meaning – and in so doing, may render the intervention more effective.

4.4.3 Imagery Rescripting: Is it CBT? A broader topic for discussion is whether, why, and how IR should be considered a cognitive behavioural technique. I refer the reader to Edwards’ (2007) review of the legacy of therapeutic techniques that led to imagery rescripting in its current form, in which he points out that multiple paradigm shifts have occurred in the field to set the stage for the approach used today. Indeed, it seems that one could find support for arguments for and against the inclusion of IR in the CBT toolbox based on its characteristics. As to ‘whether’ IR should be viewed as a CBT technique, my opinion is that it should. Why it should is, most obviously, because the available evidence about imagery in SAD – that it plays an important role in maintaining symptoms, that it can be traced to specific autobiographical events, and that it represents specific negative core beliefs and assumptions – corresponds to cognitive behavioural models of SAD and suggests that recurrent imagery and corresponding memories and meaning are important targets for therapy. It is also the case that the theoretical rationale for IR fits neatly with the cognitive models of SAD: starting with early CBT (e.g., Beck, 1976), the cornerstone of the theory across diagnoses has been the influence of maladaptive beliefs, which are influential precisely because they are not logical and are not bound to the present in a realistic way. Such maladaptive beliefs and assumptions derive from earlier learning, which may have been adaptive and appropriate at some time in the past, but

which continue to influence the individual's perceptions despite being out-of-date due to failures in updating in light of new information. This proposition is utterly embedded in IR, the goal of which is precisely to identify such instances of formative learning that influence the present, and to update the perspective and beliefs that were crystallized in learning at the time of the event. As such, IR also fits with the CBT model of anxiety treatment in important ways.

On the other hand, there are significant divergences from what is 'typical' in most applications of CBT. For example, IR is experiential, demands in-the-moment discovery, and relies heavily on therapist engagement of nonspecific factors. It activates strong emotions. It is historical, and relies on the central premise that not only recalling the past but returning to it is important. It does not employ explicit contrasting of expectations with evidence or, really, rely at all on logic as a faculty for healing. And yet, within the broad swath of cognitive and cognitive-behavioural proponents, we do find endorsement of such factors – for example, in the writings of Aaron Beck, Christine Padesky, and others. It is my own opinion that what most ties IR to CBT is the updating of meaning that it facilitates. And while knowledge of how best to incorporate IR into CBT, as well as the additive effects of IR to standard CBT for SAD, remain to be examined empirically, it seems evident that IR would enrich the extant body of CBT techniques/components by providing a tool that uses imagery in a novel application, that guides the therapist to use historical material in a beneficial and time-limited way, and that complements the emphasis on logic/rationality that is traditional in CBT.

4.5 Limitations

The present study has a number of limitations which may temper the strength of conclusions drawn on the basis of our results as well as the generalizability of the present findings. Even though the study sample consisted of participants with a clinical diagnosis of

SAD, it was not a treatment-seeking sample beyond the research context. Hence, this sample may differ from one drawn from a clinic or hospital treatment setting. However, severity of symptoms was stringently assessed and was in the clinical range on multiple measures for all participants. Similar to many treatment studies, participants were affected severely enough to merit diagnosis but functional impairment was not severe enough to preclude participation. Further, the participants were all enrolled in university, so the mean age was in young adulthood, and the age range was somewhat constrained. Moreover, all data were collected via self-report, precluding investigation of behavioural/observed outcomes. Further, some of the constructs were measured using items developed for this study which had not been previously validated. Poor reliability of some of these measures necessitated the analysis of single-item ratings rather than composite scales in certain cases.

There were also limitations to the study design. Most notably, the pre-post and waitlist control comparisons which were used neither permitted comparisons between IR and other empirically supported interventions, nor allowed for a stringent examination of treatment effects or underlying mechanisms. Moreover, the sample size was small, which may have led to some underpowered analyses. Another limitation of the present study was the use of only one therapist-researcher. Standardized protocols and semi-structured techniques were implemented throughout the study to promote consistency and to control for possible variations across participants. However, there was no way to control for nonspecific characteristics or biases of the therapist-researcher, which could have played a role in treatment outcomes. Although no change occurred prior to IR despite two 90-minute sessions, which locates the point of change at active treatment rather than nonspecific therapeutic contact, the use of a single therapist prevents us from drawing firm conclusions about IR as it may be administered from a sample of therapists.

Finally, it should be noted that the literature is not always precise in differentiating between intrusive recollections (i.e., spontaneous recollections of an autobiographical event), spontaneously occurring images, and the observer perspective on the self (e.g., Coles, Turk, Heimberg, & Fresco, 2001; Moscovitch et al., 2011; Wells, Clark, & Ahmad, 1998). In particular, the observer perspective on the self and the spontaneous, recurrent image of the self are hardly distinguishable and may in fact be separate descriptions of the same phenomenon. For example, both constructs describe seeing oneself in the mind's eye when anxiety is aroused. The impression of the self based on this internal perception is negatively biased, and is theorized to prompt behavioural compensation. There are elements of the image that tend to stay the same across situations, but some elements may morph to accommodate details of the present context. There are some differences, as well: imagery is known to contain not only visual but other sensory information, or even a "felt sense," whereas the observer perspective on the self is fundamentally visual; moreover, negative imagery may consist not only of self images but of other content as well. The hypothesis that these constructs overlap substantially enough to be considered a unitary construct remains to be examined empirically.

4.6 Future Directions

There are numerous ways forward from the present study. To begin, the findings of the present study require replication – with different therapists, samples, and settings. The efficacy of IR when administered alone versus as part of a full course of CBT should also be ascertained, in order to measure its additive value to established empirically supported treatments.

In addition, examining qualitative narratives from WIMI/ACS and IR sessions and from Cognition/Belief Summary forms would allow for a variety of novel and interesting questions to be explored (e.g., about qualities and themes of core beliefs, nature of changes to core beliefs

following IR, qualities of imagery and memories, active ingredients and predictors of IR success). The scope of this undertaking (i.e., coding and analyzing these data) exceeded current resources, but this would be a meaningful direction for future investigations of IR.

Future research might clarify possible refinements to the technique of IR for treating SAD. To begin, the IR protocol used in this study was based on available precedence in the literature, which requires identification and rescripting of a single historical memory corresponding to imagery content. However, in my observation of numerous administrations, it was not clear that the relevant memory needed to be of a single, specific event in order for an impactful rescripting experience to occur (and, at this point, there is also no empirical evidence to direct us one way or the other). Indeed, the findings of this study indicate that with IR we must focus on changing personal meaning via recollection and alteration of idiosyncratic, *symbolic* material. The verity and accuracy of recollection of the historical event may be all but irrelevant to the therapeutic task; it is the internal representation that is the ultimate target, and this representation is subjective, likely constructive, and may derive from either a single event or a series of events that have significant semantic overlap yet may have occurred over a longer period of time (see Conway, 2005). As an alternative to the current protocol which requires that a single event be identified, future research of IR might permit a more flexible definition of autobiographical memory events. For example, a recurrent event might provide an acceptable experience for rescripting, so long as a single episode could either be recalled or reconstructed from a series of similar events and the recollection is suitable to provide access to a rich meaning structure.

Given the heterogeneity of symptom expression amongst high socially anxious (HSA) individuals (Heimberg, Holt, Schneier, Spitzer, & Liebowitz, 1993; Hofmann, Heinrichs, &

Moscovitch, 2004; Moscovitch, 2009) and variable responses among patients with SAD to standard CBT protocols (e.g., Davidson et al., 2004; Moscovitch, Gavric, et al., 2012), information about therapeutic processes that distinguish IR as an intervention may have implications for treatment selection based on client characteristics. Future research would be helpful in ascertaining for whom, under which conditions, and at what point in therapy IR would be most efficacious.

This study has raised the topic of whether there is any meaningful distinction between a single brief and powerful intervention and a stand-alone *treatment* (see Hollon, 2002). In the present study, the brevity of intervention was due to contextual constraints (time, researchers/clinicians, space, finances). Indeed, the primary purpose of the study was to examine the unique processes and effects of a single therapeutic technique. Nonetheless, the strong impact of the intervention lead us to questions about the required length of treatment and optimal application of IR in therapy. Based on this study's results, why would we not simply use the three-session model implemented here to treat clients who present with SAD, rather than a longer and more costly course of treatment? There are at least a few possible reasons. First, while effect sizes were large in this study (as they have been in previous ones investigating IR for SAD; see Lee & Kwon, 2013), symptoms were not in the non-clinical range in either study by the end of treatment. Thus, while large effects are encouraging, the translation to real-life functioning may be less impressive and would indicate that further treatment would likely be of added benefit in order to achieve *clinically significant* impact. Second, we lack research that compares stand-alone IR to IR in the context of a standard package or course of CBT; while IR does well on its own, additive effects would likely be observed if IR were integrated into a standard course of CBT. Third, at present, there is no clear indication of when during treatment,

or with which types of clients, IR should be administered, either in addition to or in place of a standard course of CBT. Fourth, there is the question of determining therapist competency with and adherence to a demanding, semi-structured, and somewhat unusual treatment modality. The experiential nature of the technique and the potential for strong affect arousal would make it less generic than some CBT techniques, and it might require particular expertise. Fifth, just as IR might not be every therapist's "cup of tea," some clients may, similarly, find it to be an overly demanding or awkward intervention in which to engage. As a stand-alone treatment, the brevity of its administration demands rapid rapport building and the skilled scaffolding of relevant information, and, to a large extent, leaves the integration of the therapeutic content into the client's life up to the client alone. Ultimately, these questions require more evidence to support decision-making on the part of clinicians who would like to incorporate IR into their practice.

In conclusion, imagery rescripting is an exciting addition to the cognitive behavioural toolbox for treating social anxiety. It appears to be particularly effective for altering *self-relevant negative meaning* which, in turn, reduces social anxiety symptoms. Sufficient evidence has accumulated to indicate that socially anxious clients are likely to benefit significantly from a single session of IR. In addition to the clinical research directions outlined above, future work on IR should include the effective dissemination of this powerful tool to clinicians who are actively engaged in front-line service delivery of evidence-based psychological treatments.

Footnotes

¹Moscovitch and colleagues (2011) found comparable endorsement rates among low socially anxious (LSA) participants who were administered the same interview, indicating that negative, recurrent imagery accompanies anxiety in social or performance situations not only for those with high trait levels of social anxiety (HSA). While endorsement rates were equivalent when compared with LSA participants, HSA participants reported increased negative affect when recalling the image to mind, and rated the influence of the negative image as being significantly greater on their views of self, others, and the world. Further, because HSA participants, by definition, experience the anxiety which the imagery accompanies significantly more often than LSA participants, it seems likely that frequency of imagery intrusion might also be a predictor of differential impact of imagery on HSA and LSA individuals. However, frequency was not measured in Moscovitch and colleagues' 2011 study.

²The procedure used to gather this information is described in detail in the Methods section.

³I use the term 'subject' here to denote either the client or the research participant.

⁴However, even here, the research/clinical context remains and it is possible that general factors of this context, such as the promise of treatment as well as the clinical (but not intentionally therapeutic) tasks such as diagnostic interviewing in advance of the intervention itself, which may have had a positive impact on participant outcomes. The study design, in which participants were randomized to either WL or IR, did allow us to control for nonspecific treatment factors, such as contact with a clinician, etc., while examining the impact of specific treatment factors, such as the activities utilized in IR. See Timeline for details.

⁵While strength of belief in new/revised core beliefs was rated by the participants, directly comparing the rated strength of original core beliefs with the rated strength of their new core beliefs is not a conceptually sound approach because it does not capture qualitative differences that would be inherent in the content of the old versus revised beliefs. Because we expected these qualitative differences to be more meaningful than the quantitative ratings, a simple count is reported (i.e., how many participants changed their beliefs).

⁶For the primary analyses, I chose to follow-up the omnibus between-groups RM ANOVA with comparisons of change scores between the two conditions in order to help minimize the impact of random variance in absolute scores at each time point across conditions that was likely amplified by our modest sample size. However, I also conducted some additional analyses to examine changes in SPIN scores over time across the two groups by unpacking the omnibus RM ANOVA in different ways without the use of change scores. A RM ANOVA comparing the two groups at each of the matched time points – i.e., initial assessment (“T1”), the second live session consisting of the WIMI & ACS (“T2”), post-IR in the treatment condition/WL1 in the control condition (“T3”), and FU1 in the treatment condition/WL2 in the control condition (“T4”) - revealed a significant main effect of Time, $F(3, 66) = 6.39, p = .001, \eta^2_p = .23$ and a significant Time x Condition interaction, $F(3, 66) = 7.52, p < .001, \eta^2_p = .26$. Follow up *t*-tests comparing means in the two conditions at these time points showed no significant differences at T1 [$t(25) = .047, p = .963, \text{Cohen's } d = .02$], T2 [$t(25) = 1.42, p = .169, \text{Cohen's } d = .57$], or T3 [$t(24) = .91, p = .371, \text{Cohen's } d = .37$]. This analysis did yield a statistically significant difference at T4 between the IR condition, $M = 31.23 (SD = 9.85)$, and the WL condition, $M = 40.00 (SD = 11.39)$, $t(23) = 2.06, p = .05, \text{Cohen's } d = .86$. These analyses highlight the unexpected divergence between the two conditions at T2, in which participants who were randomly assigned to the IR condition

reported significantly greater social anxiety symptoms relative to those in the WL condition a week prior to the start of the intervention despite no differences in symptoms between conditions at T1. This pattern is illustrated graphically in Figure 5. It is likely that these differences between conditions were caused by random variance and that the impact of such variance would have been trivial within the context of a larger sample. However, in this set of analyses, the random differences between conditions at T2 consequently obscure the therapeutic effects of IR relative to WL at T3. Thus, the change score analyses are useful in helping to minimize the impact of these random differences between conditions at T2 and highlight the true impact of the intervention across the two conditions at T3. To support the change score analyses, I also ran two within-groups RM ANOVAs to identify where in the course of the study changes on the SPIN occurred in the two groups, separately. For the participants assigned to the IR condition, the omnibus RM ANOVA examining changes in SPIN score over time was significant, $F(3, 33) = 8.09, p < .001, \eta^2_p = .42$. Follow-up t -tests showed that SPIN scores decreased significantly from pre-IR to post-IR, $M = -8.77 (SD = 7.38), t(12) = 4.28, p = .001$, and continued to differ significantly from pre-IR at both followup sessions, $M = -10.54 (SD = 8.49), t(12) = 4.48, p = .001$; and $M = -13.39 (SD = 11.68), t(12) = 4.13, p = .001$, for FU1 and FU2, respectively. There was no significant rebound between intervention and FU1 ($p = .927$) or FU2 ($p = .490$), and there was no significant difference between FU1 and FU2 ($p = .325$). For participants in the WL control condition, analysis of change in SPIN scores over the course of the study was significant, omnibus $F(2.393, 19.145) = 4.03, p = .029, \eta^2_p = .34$ (Greenhouse-Geisser corrected), and follow-up t -tests showed that SPIN scores did not differ significantly between assessment at T2 and WL1 ($p = .429$) or WL2 ($p = .177$). The pattern of change and maintenance matched that of the IR condition, with significant decrease to SPIN scores T2 to post-IR, $M = -6.62 (SD = 10.78), t(12) = 2.21, p = .047$, which

continued to differ significantly from T2 at both followup sessions, $M = -8.10$ ($SD = 10.73$), $t(9) = 2.39$, $p = .041$; and $M = -7.92$ ($SD = 12.26$), $t(11) = 2.24$, $p = .047$, for FU1 and FU2, respectively. No significant rebound occurred between intervention and FU1 ($p = .631$) or FU2 ($p = .383$), or between FU1 and FU2 ($p = .571$).

⁷Correlating change scores with one another has been a contentious subject (e.g., Cronbach & Furby, 1970; but also see Williams & Zimmerman, 1996), in part due to concerns about their reliability. In these exploratory analyses, I correlated change scores derived from a reliable, multi-item measure (the SPIN) with change scores from single-item measures. It is possible that change score variables that did not correlate with SPIN change scores simply lacked adequate reliability. To explore this possibility, I first estimated the reliability of SPIN change scores using Cronbach's alpha reported in the original published article on the measure and the correlation between SPIN scores at the two time-points used to calculate the change score, using $r_{DD} = \frac{r_{xx} + r_{yy} - r_{xy}}{2 - r_{xy}}$ (where r_{xx} and r_{yy} are Cronbach's alpha .94 and r_{xy} is the correlation between SPIN scores at T1 and T6, the time points used to calculate change scores). Results revealed a reliability value of .89 for the SPIN change scores, which is satisfactory. Because it is not possible to measure the reliability of the change-scores from single-item variables with this same method, a different approach was used to estimate the reliability of the remainder of the change score variables. Specifically, I computed correlations among the full set of single-item change scores (27 change-score variables in total) to observe whether any of these individual items would correlate significantly with any of the other items. I was not interested in which of the items would be correlated per se; rather, if any of these change score variables would correlate with any of the others with at least moderate strength, it might be possible to deduce that poor reliability was likely not the reason that these variables did not also correlate with the SPIN

change scores. Conversely, if certain items did not correlate at least moderately with any other, we might deduce that an inherent quality of this item – i.e., poor reliability - was interfering with the analysis. Results revealed that all single item change scores had medium ($r \geq .20$) to large ($r \geq .30$) (Hemphill, 2003) correlations with several (range: 6-16) of the other items, thus indirectly supporting their reliability. Hence, although the findings of the exploratory inquiry into correlates of change in SAD symptoms remain tentative because of the nature of the data, it is not possible to conclude based on these additional reliability analyses that some change score variables did not correlate with SPIN change scores because they lacked adequate reliability.

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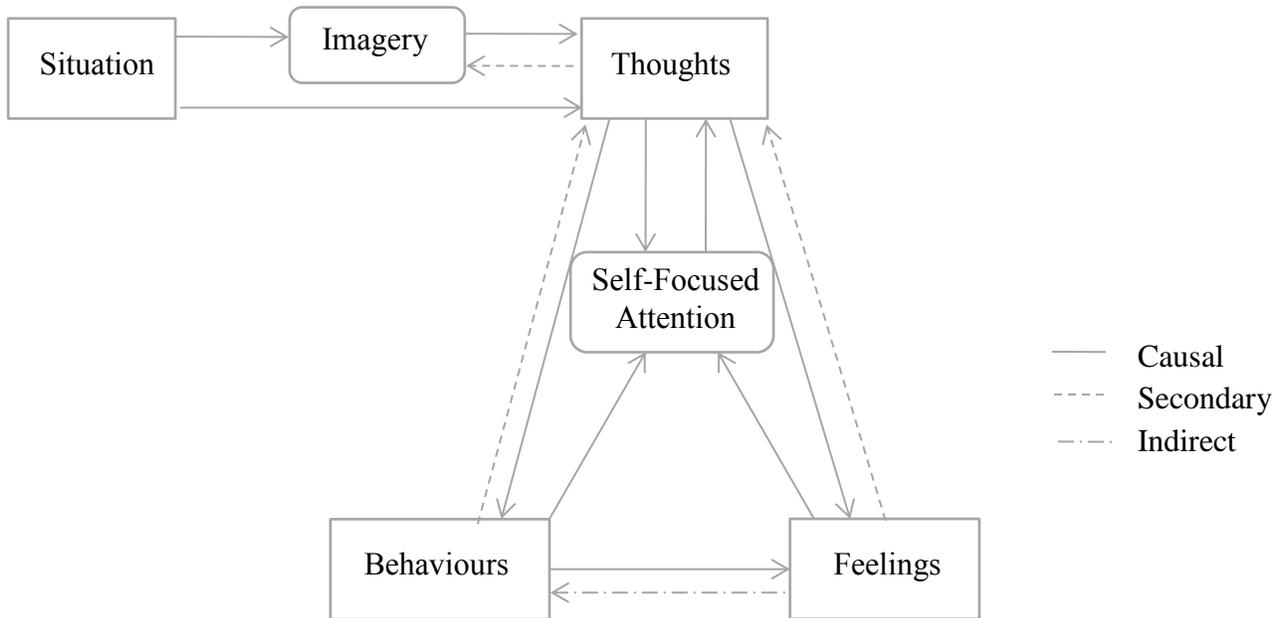


Figure 1. Present-focused cognitive model illustrating maintenance of social anxiety.

In this model, imagery is cued by the situation. The content of the imagery prompts anxiety-related “thoughts,” which constitute a broadly-defined category of mental experiences which may occur either within or outside of awareness. It is thoughts, including appraisals, expectations, assumptions, etc., that prompt feelings. Likewise, thoughts prompt behaviours. Behaviours may directly cause feelings, or this relationship may be mediated by further thoughts. Self-focused attention amplifies this maladaptive pattern, and helps to perpetuate it. Over time, thoughts may change the contents of imagery. In this figure, some arrows are dotted to indicate that the relationship in those directions is proposed to occur secondarily to the initial, causal influence in the reverse direction.

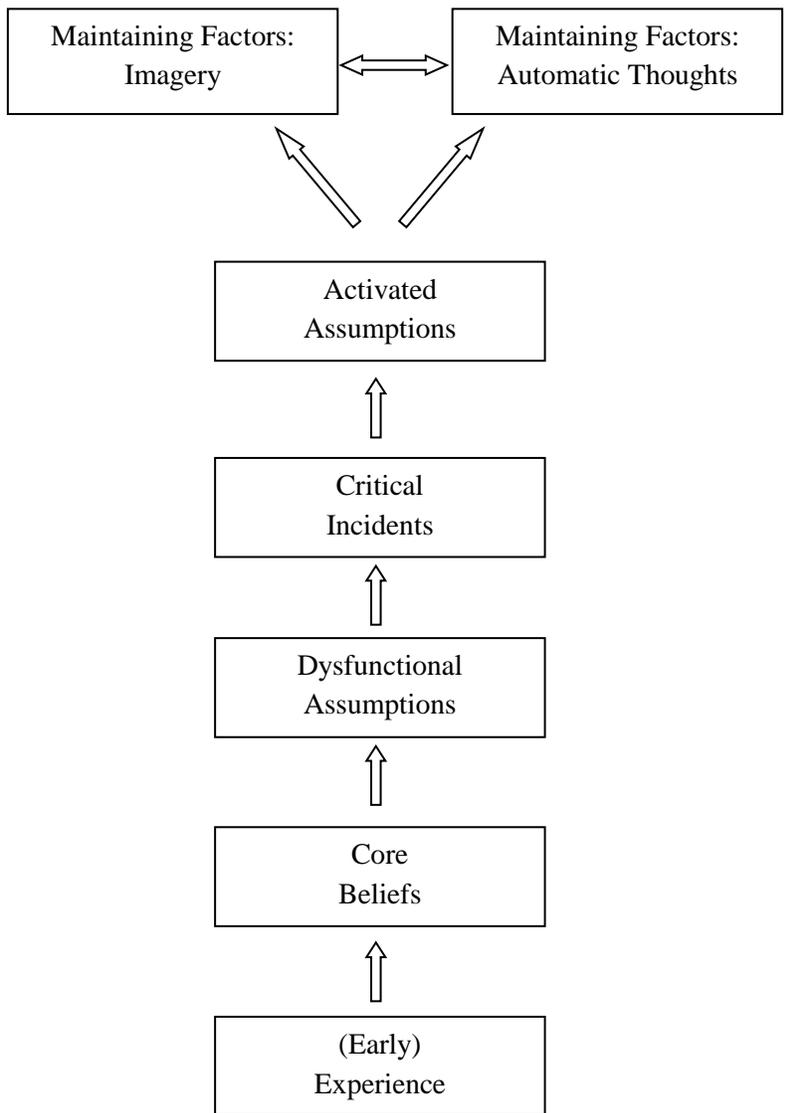


Figure 2. Transdiagnostic cognitive model of anxiety illustrating negative imagery as the present-focused manifestation of meaning based on autobiographical memories of past (early) experiences.

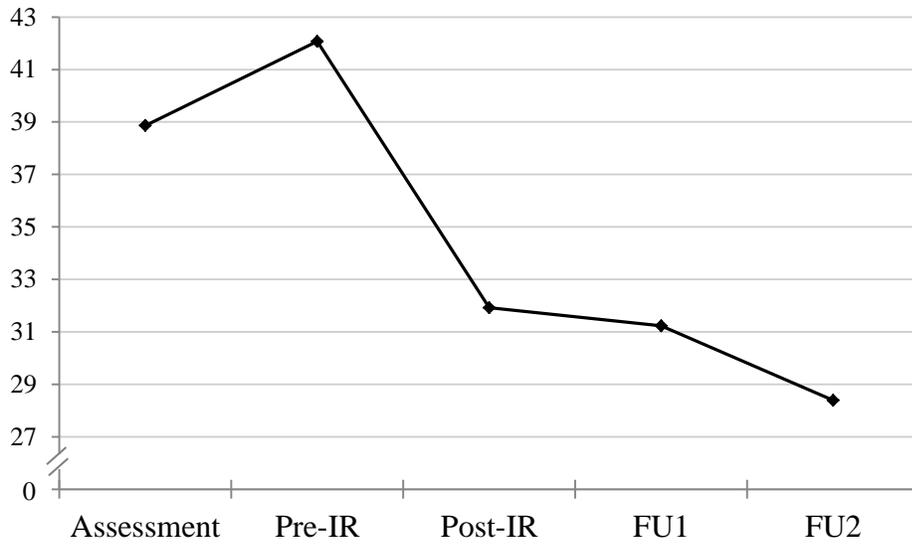


Figure 3. Social anxiety ratings on the SPIN over time in the group randomized to receive the Imagery Rescripting intervention immediately.

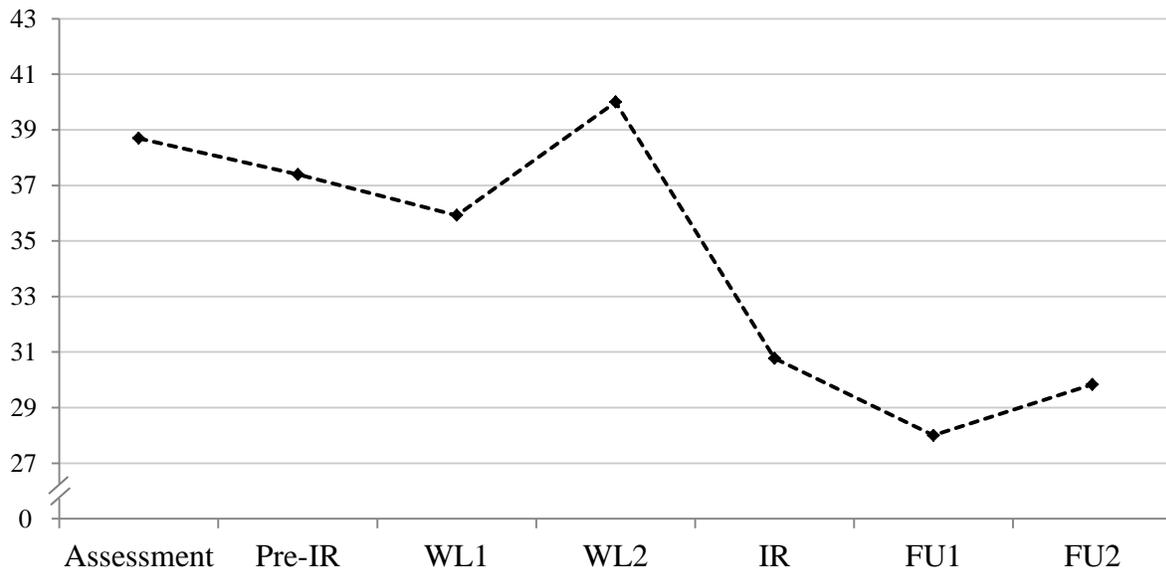


Figure 4. Social anxiety ratings on the SPIN over time in the group randomized to the waitlist condition prior to receiving the Imagery Rescripting intervention.

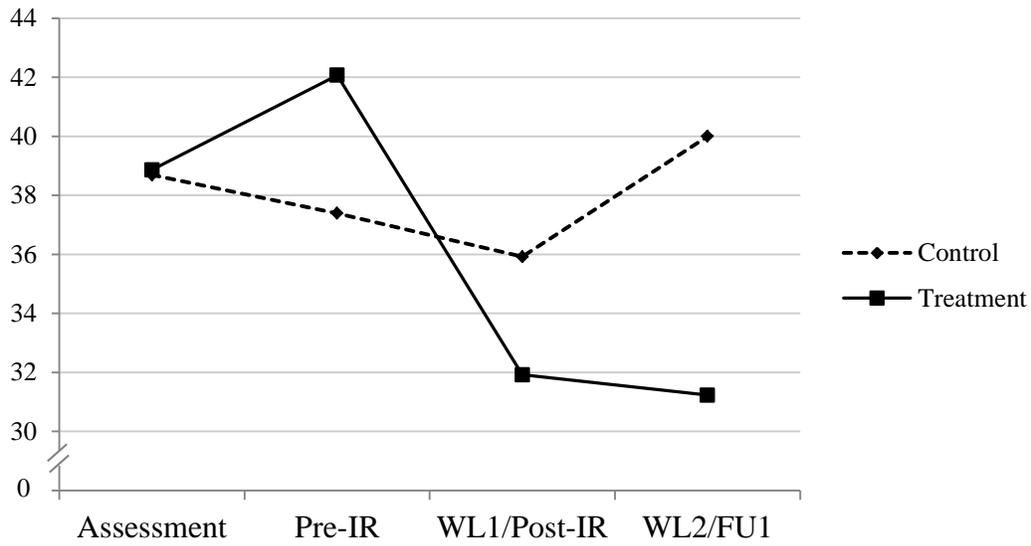


Figure 5. Social anxiety ratings on the SPIN in both groups at matched time points.

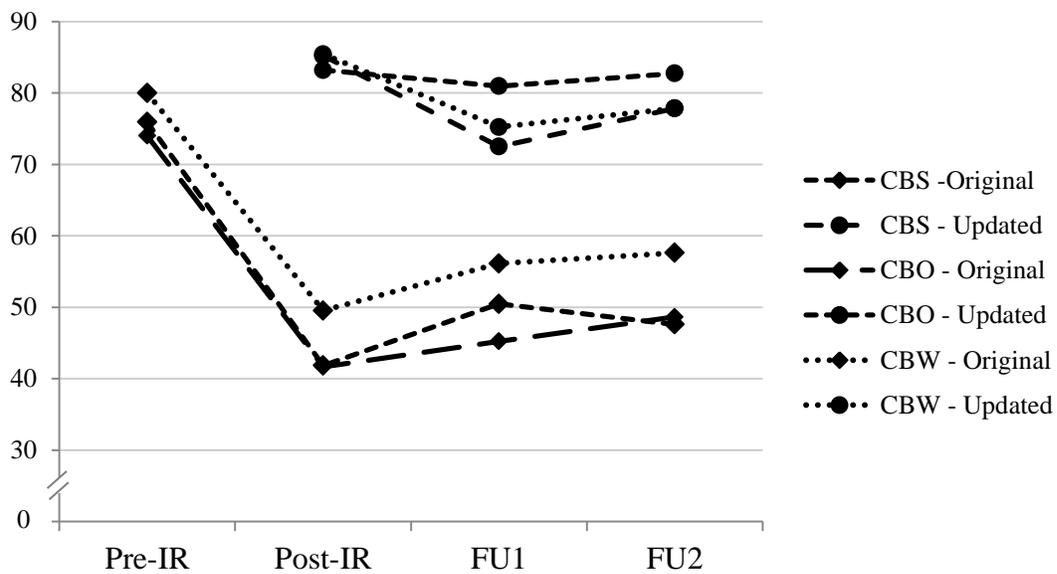


Figure 6. Strength of belief in core beliefs, original and updated (i.e., revised following IR), about the self, others, and the world. CB = Core beliefs; S = Self; O = Other; W = World.

Table 1. *Sample characteristics.*

	Overall Sample	Waitlist Control Condition	Imagery Rescripting Condition	Statistical Test	<i>p</i>
Age in years (<i>SD</i>)	19.52 (1.25)	19.46	19.57	<i>t</i> -test	.825
Gender (% female)	70%	62%	79%	<i>t</i> -test	.420
Ethnicity				chi-square	.475
White/European	42%	54%	31%		
Chinese	30%	23%	39%		
Other Asian	18%	16%	23%		
Middle Eastern	4%	8%	0%		
Black/Caribbean	4%	0%	8%		
Symptom measure scores at initial assessment					
SPIN	38.78 (8.92)	37.39 (7.74)	42.07 (9.35)	<i>t</i> -test	.169
LSAS-SR	75.89 (17.67)	70.39 (20.60)	78.64 (19.90)	<i>t</i> -test	.300
DASS_D	8.18 (5.02)	6.39 (4.33)	7.60 (5.15)	<i>t</i> -test	.545
Comorbid Diagnoses				chi-square	.306
None	60%	62%	57%		
MDD	11%	8%	14%		
Dysthymia	7%	15%	0%		
GAD	7%	0%	7%		
PTSD	4%	4%	0%		
Bulimia	4%	0%	4%		
Specific phobia	4%	0%	4%		
Multiple comorbidities	11%	0%	11%		

Note: SPIN = Social Phobia Inventory; LSAS-SR = Liebowitz Social Anxiety Scale- Self Report; DASS = Depression Anxiety Stress Scales, Depression Subscale.

Table 2. *Means and standard deviations for control and treatment groups on symptom measures pre-IR, post-IR, at WL1, WL2, 1-week followup, and at 1-month followup.*

Scale	Control Group											
	Pre-Tx		WL1		WL2		Post-Tx		FU1		FU2	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
SPIN	37.38	7.68	35.92	11.71	40.00	11.39	30.77	14.49	28.00	11.25	29.83	14.10
LSAS	70.39	20.60	67.62	27.99	67.83	28.38	59.23	24.61	53.60	14.97	57.39	25.52
DASS_D	6.39	4.33	8.00	4.04	7.58	6.37	6.77	4.23	5.00	4.08	4.92	4.50
Experimental Group												
SPIN	42.07	9.35					31.92	10.66	31.23	9.85	28.39	12.99
LSAS	78.64	19.90					68.85	18.85	50.39	17.60	53.31	18.47
DASS_D	7.60	5.15					6.00	5.98	5.77	5.64	6.46	6.15

Note: Tx = Treatment; WL = Waitlist; FU = Followup; SPIN = Social Phobia Inventory; LSAS-SR = Liebowitz Social Anxiety Scale-Self Report; DASS_D = Depression Anxiety Stress Scales, Depression Subscale.

Table 3. Participants' reported associated cognitions: Automatic thoughts (ATs) and core beliefs about self, others, and world.

P #	Type	Original Associated Cognition	Updated Associated Cognition
10	AT	You're going to mess things.	You're going to mess this up, but life goes on.
	Self	I am deficient.	I am different but that's okay.
	Others	People are unforgiving.	People worry too much about fitting in.
	World	It's me versus the world.	It's me <i>and</i> the world.
11	AT	I look disgusting... why am I even eating around other people?	Food is exciting - it's natural and enjoy it.
	Self	I have no self-control.	I have control over eating and things in general.
	Others	People are judgmental and cruel.	People care about me and when they express concern it must mean that they really love me.
	World	The world is superficial and you're seen as disgusting if you have no self-control.	People may seem like they're judging you but a lot of the time they're just trying to help; people care about each other and that's why they're paying attention to what you're doing.
14	AT	Am I speaking loud enough? Am I talking too fast?	Talk slowly and don't worry about other people in the room.
	Self	I am not as good as others.	I am going through the same situation as others - I'm not so different from other people.
	Others	<i>None.</i>	<i>None.</i>

	World	<i>None.</i>	<i>None.</i>
16	AT	You're so stupid. You can never do anything.	If you take an optimistic attitude, you can achieve more than you believe . You're not as stupid as you think.
	Self	I am weak.	I am weak but I can be stronger if I'm more determined.
	Others	People are judgmental & look down on me.	People look down on me because I also look down on myself.
	World	The world is not fair.	The world's not fair, but I can work harder to determine my own fate.
20	AT	I can't believe this happened.	You can do it.
	Self	I'm dumb.	Being inexperienced doesn't mean that I am dumb.
	Others	Given the chance to take the upper hand people will take advantage of others.	<i>Same.</i>
	World	The world is a dangerous place.	Within this dangerous place there are still lots of opportunities and choices. It's up to you to you to pick the ones that are right for you.
22	AT	What if I stutter? What if I can't answer their questions? What if I can't articulate my thoughts? I know I'm going to blush but it's ok.	I wonder what's going on with other people that's causing their response?
	Self	I am weak.	I am satisfied and happy with what I have, and I am accepting of my weak points.
	Others	People are mean.	Some people are insecure and need guidance.
	World	The world is a competitive place. Everyone's just trying to kill each other so they can thrive.	The world is a confusing place. Your opinion on certain aspects of life really depends on who you surround yourself with.

23	AT	I'm not as good as others.	We all have different strengths and weaknesses.
	Self	I'm unacceptable. I'm missing something.	Nobody's perfect - weaknesses are okay to have.
	Others	People are judgmental.	Other people's experiences are different from mine.
	World	The world is a place of high standards and high expectations.	The world is a place of reasonably high standards.
24	AT	You can't do it.	You can do it.
	Self	I'm a coward and I'm weak.	I do have it in me - sometimes I just need a push to get it out.
	Others	Other people can handle this. People don't 'get' (understand) me.	I can handle this just as well as others. People get me more than I think.
	World	<i>None.</i>	There's good and bad out there - you choose the path you take. There will be other chances if this doesn't work out.
25	AT	I'm going to make an idiot of myself. People are going to think I'm stupid. Why am I so nervous? Why does this matter?	I can have an opinion. Even if people disagree with it, I still have the right to say it. Even if it is wrong.
	Self	I'm nothing if I fail at school.	<i>Same.</i>
	Others	People are more successful or better than me. People will put me down to feel better about themselves; people are catty and awful.	People are more accepting of me than I often assume. People are all unique. I cannot judge people based on previous experiences.
	World	The world is a judgmental place where your value is determined by how others think of you.	The world can be judgmental but it's also accepting
26	AT	I'm boring this person. They don't want to be here. It's my responsibility to end this conversation.	I might think I'm boring this person but I don't know their point of view. It's my own assumption that they don't want to be here. It's not my responsibility to end this conversation - they would

			leave if they wanted to.
	Self	I am boring.	<i>Same.</i>
	Others	If I trust other people, they will betray me or abandon me.	I can trust the people who I really care about and who care about me.
	World	The world is a very bleak place and everyone is out for themselves.	The world is a very bleak place but there are a few people you can rely on and trust - and that's all you need to get by.
31	AT	They're going to think I'm boring or not smart enough.	It doesn't really matter what they think of me. What matters is what I think of myself.
	Self	If I'm not perfect, I'm nothing.	As long as I do the best that I can, the outcome doesn't matter, and I'll be content with it.
	Others	Other people are critical and judgmental and they expect me to be capable more or be better than the average person.	People have their own problems that they are facing. They're not especially critical and judgmental of me and they don't expect more of me than anybody else.
	World	To be successful in the world you have to be perfect at everything.	The world is not as bad a place as I perceive it to be. I just have to do my best and the world will be accepting of me.
32	AT	Just relax, you'll get over it soon, it'll be over quickly. I can go do something fun or interesting after.	<i>Same.</i>
	Self	I am a disappointment. If I fail, I'll be a nobody.	Even if you fail, there will still be positive things that will happen to you - you'll still be a somebody.
	Others	<i>None.</i>	<i>None.</i>
	World	The world is a competitive place - if you can't compete, there's no place for you.	The world is a competitive place - but if you keep trying, there will be something for you to look towards.

33	AT	This is so fail; Not Again!	The amount of effort you put in is what you'll get out of it.
	Self	I'm a disappointment	I'm not as bad as I think I am.
	Others	<i>None.</i>	People are pretty cool.
	World	<i>None.</i>	<i>None.</i>
34	AT	You are definitely going to screw up	You might screw up- and if you do it will not really matter.
	Self	I have a huge weakness in my character.	I have a weakness in my character.
	Others	People are cruel and will judge negatively when they can.	People might judge negatively when they can. In the long run it still doesn't matter.
	World	<i>None.</i>	The world doesn't really know you exist, even if you screw up it most likely makes no impact at all.
35	AT	Why is this person talking to me? What do they want/need from me? Don't look over at them. Pretend they are not there.	Why is this person behaving this way? Where are they coming from?
	Self	I'm not likeable.	I'm not any more uncomfortable than anyone else. I am unique- I have positive and negative qualities. If people are critical of me it may be more about themselves than my own flaws.
	Others	People intentionally look for my flaws.	People are not necessarily out to get you, they're just looking after themselves first.
	World	It's 'survival of the fittest'. Everyone is out for themselves at the expense of other people.	It is survival of the fittest- If people are put into a situation in which they are uncomfortable they will look out for themselves first. They won't be as concerned about making others feel comfortable as they are ensuring that they themselves feel comfortable.

37	AT	Silly person- stop thinking about this. It's not going to help.	Silly person- we can think about something else now. We'll deal with this when it comes up.
	Self	I must not fail. I should be perfect.	Failure happens, but so long as I have the best intentions the outcome will be acceptable and not the end of the world.
	Others	People are critical and judgmental. They wait and watch for a slip-up and are satisfied when it happens.	Other people may notice mistakes, but their opinions of me won't be influenced by it.
	World	<i>None.</i>	The world doesn't care if you're perfect, it'll keep going despite a slip-up.
40	AT	You don't belong.	Nobody really is where they belong; everyone just has to make do with the people they have around them.
	Self	I am different, I'm disconnected from others and don't have the right to join the group.	I am different, but so is everybody else. Everybody feels disconnected – it's up to the individual to connect with everybody else.
	Others	Other people are very connected with each other; there's no need for me to be connected.	Other people may be more connected, but everyone has to work on it just the same.
	World	It doesn't make a difference in the world no matter who I am or what I do.	It may not make a difference to the world, who you are or what you do; but it makes a difference to you and the people around you.
41	AT	You're not smart enough, you can't do this.	Feeling that anything is open ended, anything can happen, not just expecting bad things.
	Self	I'm a failure and disappointment to my parents.	What is more important rather, is not disappointing myself. It's my life not my parents life. I'm not a disappointment to myself, I'm still on my journey to finding myself.
	Others	Other people are judgmental and not very nice, they	While not everyone may be a nice person, you can choose who

		put down others to feel better about themselves.	you surround yourself with, and who you listen to/believe and how you react to the people that are not nice - you can just remind yourself it doesn't matter what they think.
	World	You can have good expectations and intentions, but you can't trust that other people have good intentions too, even if they give off the impression that they do, and thus the world can be very deceiving.	It's most important that you trust yourself – it's okay if other people let you down as long as you don't let yourself down.
45	AT	What if it is a really stupid question?	Is the question relevant to what I am trying to get out of it?
	Self	Other people see me as a failure.	Be yourself - Don't be scared of criticism or judgment -If you are going to make a mistake, that is okay, learn from it, it's better than not taking a chance. Realize others could be wrong with their judgment, so do not give up.
	Others	People are judgmental.	Other people are not judgmental. People only see that side of you that you show them.
	World	The world is a place where if you aren't good enough for the standards, you'll be marginalized.	Don't give up. You will gain nothing if you risk nothing. You should not stop until you get what you wanted. Don't be scared of others' perception of you, if they do not like you, it is not the end of it.
47	AT	No one else did a bad job, but I will. I'm incompetent.	Other people aren't perfect. They'll make mistakes and I will too- so I shouldn't judge myself for it but just move on.
	Self	I'm worthless. If people get to know me, they'll reject me.	If I accept myself, other people will accept me. I've got lots of qualities and traits that make me likeable and I can laugh at my shortcomings or work on them if I want to change.
	Others	Other people are confident and know what they're doing.	Other people don't judge me as much as I might judge myself. Everyone has their shortcomings- some just hide it better than

			others. I don't judge people for their shortcomings so I can expect others don't judge me either
	World	The world is a great place, but if I'm not competent I can't be a part of it.	You don't have to go through the one "ideal" path to have a place in the world. The world is a great place in general!
	AT	I can't speak French/Arabic. Why won't they give me a chance? Why won't they help me?	English is my mother tongue - I'm bound to make mistakes in Arabic or French. You have to smile through people laughing.
	Self	I am a disappointment. I lack confidence.	I have trouble with second languages. I'm learning and I'm sensitive.
	Others	People are unforgiving, unhelpful, and may even be cruel. People enjoy belittling others.	Some people are bullies, some people are superheroes or teachers. Some people enjoy belittling others, but not everybody.
	World	The world is harsh - people are sharks.	It's a sharky world out there, but there are nice people too. To swim with the sharks you have to have tough skin.
48	AT	I'm putting out a bad impression.	Don't think too much about making a bad impression - it might not matter that much to the other person anyway.
	Self	I'm unlikeable.	I'm a shy person but it's something that can be changed.
	Others	Others have power over me and they are quick to judge.	Others don't know much about you, but they're likely friendly people who aren't out to get you.
	World	It's a hard world. You have only one chance to get it right.	You have to jump onto opportunities presented to you. The world isn't going to end if you fail the first time.
49	AT	We need to get out of this situation. We can't do this.	[None recorded.]
	Self	I am deficient. People will see this and will not accept me.	I'm not deficient, I'm human like everyone else.

	Others	Other people can't relate to my struggles, so they'll be judgmental and reject me.	Other people can relate to my experiences because they experience them as well. Because they have similar struggles, they'll be understanding rather than judgmental or rejecting.
	World	The world is harsh and cruel. You constantly have to prove yourself or you will have a sad, unfulfilled existence.	The world is full of challenges. You need to do your best and if you do overall good things will come.
52	AT	The prof dislikes me already, they'll laugh, I'm going to have a heart attack- get out of here.	It is good that I am participating. It doesn't matter what the prof may be thinking. The fact that I'm taking initiative to participate is what matters.
	Self	I'm not likeable. I'm dumb and I have flaws that need to be fixed.	I am not dumb. I am a smart person with a lot of potential. I have a good reason to be confident and speak up for myself. I just need to stay true to myself and not worry or take anyone's criticism to heart.
	Others	Other people are perfect and superior to me. People can't be trusted. They are two faced and self-centered people. They are also very confident.	It is okay if people are not always honest and express it if they do not like me. People are not all perfect, they do attain flaws just like me. Nobody is superior to you unless you make them that way,
	World	You can't trust the world- it is self-centered and nihilistic.	You cannot trust the world. Even though the world is self-centered, people have their reasons and intentions which are overlooked for being as so. Their intentions are not always there to degrade others.
54	AT	Why did I come here? "Is it okay for me to leave?"	Take time to think beyond the negative because there are probably positive reasons why I came here. I came to be engaged and it's time to find ways to make that happen. This doesn't have to be scary because other people are probably in the same boat.

	Self	I do not matter.	I only do not matter if I choose not to matter. I can matter if I choose to take part.
	Others	Other people are connected with each other. They do not care to include me. Other people do not know how it feels to be alone.	Other people may be feeling the same as me. It is my role to go out there and decide for myself.
	World	It is hard to find your place in the world. There are lots of dead-ends. If you do not get it right at first then it is difficult to fit in.	It is hard to find your place in the world. There are dead ends at times but if things don't go right the first time then there are always other opportunities to get them going the way you want it to.
55	AT	I don't want to do this but I have to. I can always leave if it's too uncomfortable but I have to try.	There are a lot of people and they all have their own objectives. Things may turn out well and even if they don't there is a lot of distance between me and them so it's okay.
	Self	I am invisible.	I am invisible, but just like everyone else.
	Others	Other people are brave and confident - and even the possibility that they may reject me is distressing.	Other people may or may not only be appearing confident.
	World	You need to be loud or brave to succeed in the world.	You need to appear confident to succeed.
56	AT	Uh oh, not again, déjà vu.	[None recorded.]
	Self	I'm a disappointment.	Even if I feel like a disappointment sometimes, I have the potential to do well.
	Others	People have high expectations of me. If I don't fulfill those expectations, then will be disappointed in me and reject me.	Other people's expectations of me are not as high as I might expect. Even if they are, people are motivated to help, not just to put others down.
	World	The future doesn't look any brighter. It's hard to survive in the world- it's a competitive place where if	The world is a competitive place - but to improve yourself and not be left behind you have to use trial and error and make

		you don't improve yourself, you'll be left behind.	mistakes and learn from them. The future will be better if you try and improve the way.
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Table 4a. *Summary of Repeated Measures ANOVAs of change in compassion, forgiveness, and acceptance towards self and others.*

Variable	Omnibus			Pre-Post		Pre-FU1		Pre-FU2		Post-FU1		Post-FU2		FU1-FU2	
	F (df)	p	η^2_p	t (df)	p										
Compassion for Self	2.47 (3, 63)	.070	.105	3.06 (24)	.005	1.05 (22)	.307	0.14 (22)	.890	2.31 (23)	.031	2.27 (23)	.033	0.81 (21)	.427
Forgiveness of Self	10.59 (3, 60)	.000	.346	5.45 (23)	.000	2.31 (22)	.031	1.45 (22)	.162	3.46 (21)	.002	3.43 (22)	.002	0.72 (21)	.480
Acceptance of Self	16.73 (3, 63)	.000	.443	7.34 (24)	.000	3.66 (22)	.001	3.76 (22)	.001	3.32 (22)	.003	2.94 (23)	.007	0.21 (21)	.833
Compassion for Others	7.63 (3, 63)	.000	.267	4.10 (24)	.000	4.53 (22)	.000	2.71 (22)	.013	0.59 (22)	.560	1.44 (23)	.164	1.23 (21)	.234
Forgiveness of Others	7.14 (3, 60)	.000	.263	4.24 (23)	.000	2.42 (22)	.024	2.47 (22)	.022	2.57 (21)	.018	2.12 (22)	.045	0.24 (21)	.815
Acceptance of Others	6.73 (3, 63)	.001	.243	3.87 (24)	.001	2.47 (22)	.022	1.10 (22)	.283	2.11 (22)	.047	2.79 (23)	.010	1.89 (21)	.073

Note. Pre = Pre-treatment; Post = post-treatment; FU = followup

Table 4b. *Between-groups comparisons (IR vs. WL) of compassion, forgiveness, and acceptance towards self and others at matched time points after either the intervention or waitlist.*

Variable	<i>t-test</i>		
	<i>t</i>	<i>df</i>	<i>p</i>
Compassion for Self	3.56	24	.002
Forgiveness of Self	3.69	23	.001
Acceptance of Self	6.98	24	<.001
Compassion for Others	2.68	24	.013
Forgiveness of Others	1.67	23	.108
Acceptance of Others	2.06	24	.050

Table 5. Correlations of change between process variables measured from pre-IR to post-IR and SPIN scores measured from intake to one-week followup.

	Pearson's <i>r</i>	<i>p</i>	<i>n</i>	Spearman's <i>Rho</i>	<i>p</i>	<i>n</i>
	SPIN			SPIN		
CB Self	.515	.012	23			
CB Other				.200	.384	21
CB World	-.019	.942	17			
<i>Self:</i>						
Compassion	-.497	.019	22			
Forgiveness	-.464	.030	22			
Acceptance	-.362	.098	22			
<i>Others:</i>						
Compassion	-.071	.755	22			
Forgiveness	.137	.542	22			
Acceptance	-.183	.414	22			
<i>Image Qualities:</i>						
Real				.113	.607	23
Change				-.016	.942	23
RepNeg	-.061	.783	23			
InflViewSelf	.270	.214	23			
MoodWorse	.157	.473	23			
CanControl	-.118	.593	23			
<i>Memory Qualities:</i>						
Sense of Powerlessness				-.068	.757	23
Sense of Empowerment	-.179	.415	23	.316	.142	23
Identify w Self in Mem				-.373	.080	23
Don't identify w Self in	.082	.710	23			
Negative feelings		-.271	23			
Intense feelings	.179	.415	23			
Anxiety	-.239	.285	22			
<i>Defusion from:</i>						
Scale total	-.247	.267	22			
SAD group social	-.372	.088	22			
SAD 1-1 social				.451	.035	22
CB Self	-.322	.144	22			
CB Other	-.214	.411	17			
CB World	-.214	.411	17			

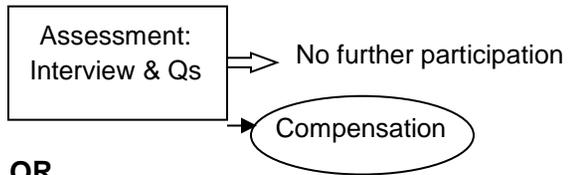
Note: Spearman's rho is reported whenever change variables were not normally distributed ($p < .05$ on Shapiro-Wilk tests of normality)

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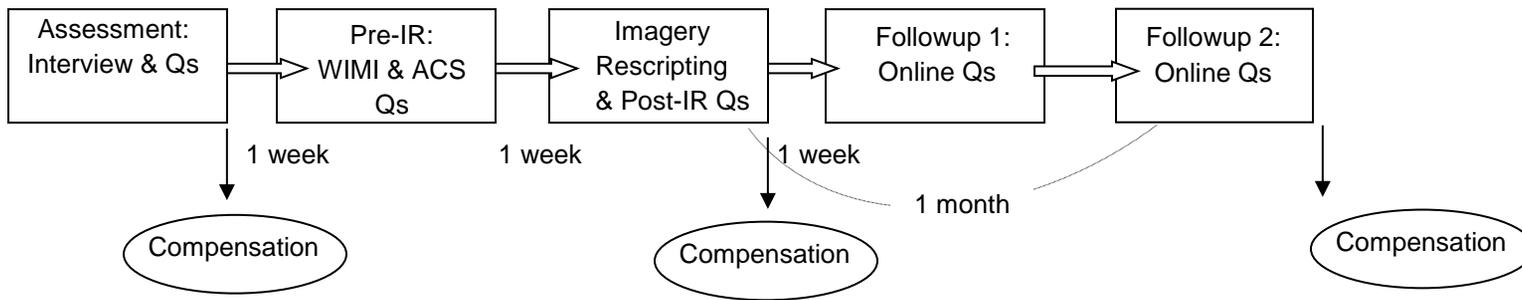
Appendix A: Visual timeline

Participants excluded following Assessment:



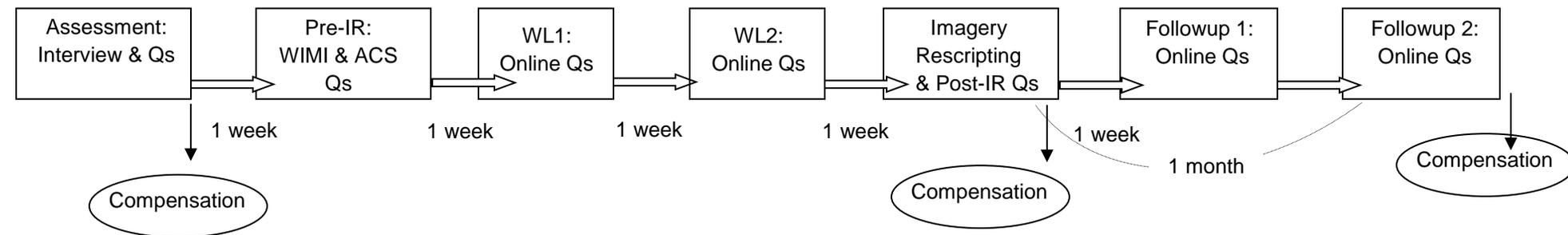
OR

Intervention Condition



OR

Control (Waitlist-then-Intervention) Condition



Appendix B. Measures administered at each time point.

Assessment	Pre-IR	WL1*	WL2*	IR & Post-IR	FU1	FU2
M.I.N.I.	W.I.M.I. & A.C.S.			Imagery Rescripting		
	Image, Memory, Cognition (IMC) Summary Sheet			Revised I.M.C. Summary Sheet		
SPIN	SPIN	SPIN	SPIN	SPIN	SPIN	SPIN
LSAS	LSAS	LSAS	LSAS	LSAS	LSAS	LSAS
DASS_D	DASS_D	DASS_D	DASS_D	DASS_D	DASS_D	DASS_D
DDS • Total • SAD items	DDS • Total • SAD & CB items	DDS • Total • SAD & CB items	DDS • Total • SAD & CB items	DDS • Total • SAD & CB items	DDS • Total • SAD & CB items	DDS • Total • SAD & CB items
	Image Items	Image Items	Image Items		Image Items	Image Items
	Memory Items	Memory Items	Memory Items	Memory Items	Memory Items	Memory Items
	Associated cognition items	Associated cognition items	Associated cognition items	Associated cognition items	Associated cognition items	Associated cognition items

*Waitlist condition participants only

Appendix C. *Social Phobia Inventory* (SPIN; Connor et al., 2000)

SPIN

Please choose a number to indicate how much the following problems have bothered you during the past week. Choose only one number for each problem, and be sure to answer all items.

- 0 = Not at all
- 1 = A little bit
- 2 = Somewhat
- 3 = Very much
- 4 = Extremely

1.	I am afraid of people in authority.	0	1	2	3	4
2.	I am bothered by blushing in front of people.	0	1	2	3	4
3.	Parties and social events scare me.	0	1	2	3	4
4.	I avoid talking to people I don't know.	0	1	2	3	4
5.	Being criticized scares me a lot.	0	1	2	3	4
6.	Fear of embarrassment causes me to avoid doing things or speaking to people.	0	1	2	3	4
7.	Seating in front of people causes me distress.	0	1	2	3	4
8.	I avoid going to parties.	0	1	2	3	4
9.	I avoid activities in which I am the centre of attention.	0	1	2	3	4
10.	Talking to strangers scares me.	0	1	2	3	4
11.	I avoid having to give speeches.	0	1	2	3	4
12.	I would do anything to avoid being criticized.	0	1	2	3	4
13.	Heart palpitations bother me when I am around people.	0	1	2	3	4
14.	I am afraid of doing things when people might be watching.	0	1	2	3	4
15.	Being embarrassed or looking stupid are among my worst fears.	0	1	2	3	4
16.	I avoid speaking to anyone in authority.	0	1	2	3	4
17.	Trembling or shaking in front of others is distressing to me.	0	1	2	3	4

LSAS-SR

This measure assesses the way that social phobia plays a role in your life across a variety of situations. Read each situation carefully and answer two questions about that situation. The first question asks how anxious or fearful you feel in the situation. The second question asks how often you avoid the situation. If you come across a situation that you ordinarily do not experience, we ask that you imagine "what if you were faced with that situation," and then, rate the degree to which you would fear this hypothetical situation and how often you would tend to avoid it. Please base your ratings on the way that the situations have affected you in the last week. *Fill out the following scale with the most suitable answer provided below.*

- | | |
|------------------------|---------------------------------|
| FEAR OR ANXIETY | AVOIDANCE |
| <i>0 = None</i> | <i>0 = Never (0%)</i> |
| <i>1 = Mild</i> | <i>1 = Occasionally (1-33%)</i> |
| <i>2 = Moderate</i> | <i>2 = Often (34-67%)</i> |
| <i>3 = Severe</i> | <i>3 = Usually (68-100%)</i> |

	FEAR OR ANXIETY	AVOIDANCE
1. Telephoning in public		
2. Participating in small groups		
3. Eating in public places		
4. Drinking with others in public places		
5. Talking to people in authority		
6. Acting, performing or giving a talk in front of an audience		
7. Going to a party		
8. Working while being observed		
9. Writing while being observed		
10. Calling someone you don't know very well		
11. Talking with people you don't know very well		
12. Meeting strangers		
13. Urinating in a public bathroom		
14. Entering a room when others are already seated		
15. Being the center of attention		
16. Speaking up at a meeting		
17. Taking a test		
18. Expressing a disagreement or disapproval to people you		

don't know very well		
19. Looking at people you don't know very well in the eyes		
20. Giving a report to a group		
21. Trying to pick up someone		
22. Returning goods to a store		
23. Giving a party		
24. Resisting a high pressure salesperson		

Appendix D: *Depression Anxiety Stress Scales 21-item* (DASS-21; Lovibond & Lovibond, 1995).

DASS-21

Please read each statement and circle a number 0, 1, 2 or 3 which indicates how much the statement applied to you *over the past week*. There are no right or wrong answers. Do not spend too much time on any statement.

0 = Did not apply to me at all

1 = Applied to me to some degree, or some of the time

2 = Applied to me to a considerable degree, or a good part of time

3 = Applied to me very much, or most of the time

1.	I found it hard to wind down	0	1	2	3
2.	I was aware of dryness of my mouth	0	1	2	3
3.	I couldn't seem to experience any positive feeling at all*	0	1	2	3
4.	I experienced breathing difficulty (e.g., excessively rapid breathing, breathlessness in the absence of physical exertion)	0	1	2	3
5.	I found it difficult to work up the initiative to do things	0	1	2	3
6.	I tended to over-react to situations	0	1	2	3
7.	I experienced trembling (e.g., in the hands)	0	1	2	3
8.	I felt that I was using a lot of nervous energy	0	1	2	3
9.	I was worried about situations in which I might panic and make a fool of myself	0	1	2	3
10.	I felt that I had nothing to look forward to	0	1	2	3
11.	I found myself getting agitated	0	1	2	3
12.	I found it difficult to relax	0	1	2	3
13.	I felt down-hearted and blue	0	1	2	3
14.	I was intolerant of anything that kept me from getting on with what I was doing	0	1	2	3
15.	I felt I was close to panic	0	1	2	3
16.	I was unable to become enthusiastic about anything	0	1	2	3
17.	I felt I wasn't worth much as a person	0	1	2	3
18.	I felt that I was rather touchy	0	1	2	3
19.	I was aware of the action of my heart in the absence of physical exertion (e.g., sense of heart rate increase, heart missing a beat)	0	1	2	3
20.	I felt scared without any good reason	0	1	2	3
21.	I felt that life was meaningless	0	1	2	3

*Bolded items constitute depression subscale.

Appendix F: *Image items.*

IMAGE QUESTIONNAIRE

INSTRUCTIONS: Please answer these questions in reference to the following image:

[Insert individualized content here.]

INSTRUCTIONS: Please answer the following questions about the image that you just recollected according to the scale below:

1-----2-----3-----4-----5
 Very Slightly or A Little Moderately Very Much Extremely
 Not At All

	(1)	(2)	(3)	(4)	(5)
	<i>Very Slightly or Not At All</i>	<i>A Little</i>	<i>Moderately</i>	<i>Very Much</i>	<i>Extremely</i>
Image Qualities: Perception					
The content of the image seemed very real to me.					
While envisioning the mental image, I feel able to mentally change the details of the image.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Image Feelings/Emotions					
While recalling the mental image , the emotions I felt were <i>negative</i> .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
While recalling the mental image , the emotions I felt were <i>intense</i> .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
While experiencing the mental image, I felt <i>anxious</i> .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The Image in My Life					
The mental image represents a part of myself that I am embarrassed, ashamed, or otherwise don't feel very good about.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
This mental image influences how I view myself.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
This mental image influences how I view other people.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
This mental image influences how I view the world in general.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
In what it means to me about the world in general.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Appendix G: *Memory items.*

MEMORY QUESTIONNAIRE

INSTRUCTIONS: Please answer these questions in reference to your memory of the following event:

[Insert individualized content here.]

INSTRUCTIONS: Please answer the following questions about the event that you just recollected according to the scale below:

1-----2-----3-----4-----5
 Very Slightly or A Little Moderately Very Much Extremely
 Not At All

	(1)	(2)	(3)	(4)	(5)
	Very Slightly or Not At All	A Little	Moderately	Very Much	Extremely
Memory Feelings/Emotions					
While remembering the event, the emotions I felt were <i>negative</i> .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
While remembering the event, the emotions I felt were <i>intense</i> .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
While remembering the event, I felt <i>anxious</i> .	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The Memory in my Life					
The memory was of an event that I am embarrassed, ashamed, or otherwise don't feel very good about.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
This event influenced how I view myself.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
This event influenced how I view other people.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
This event influenced how I view the world in general.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Memory Qualities, Personal					
I 'identify' with the person I was at the time of the event (i.e., I feel like I am similar now to the person I was then).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I no longer 'identify' with the person I was at the time of the event (i.e., I feel like I am different now from the person I was then).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The memory of this event is imbued with a sense of powerlessness.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
When I reflect on the event now, I feel a sense of empowerment.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

I feel compassion towards the other people who were part of the memory.	<input type="checkbox"/>				
I feel compassion towards myself at the time of the memory.	<input type="checkbox"/>				
I feel forgiveness towards the other people who were part of the memory.	<input type="checkbox"/>				
I feel forgiveness towards myself at the time of the memory.	<input type="checkbox"/>				
I feel acceptance towards the other people who were part of the memory.	<input type="checkbox"/>				
I feel acceptance towards myself at the time of the memory.	<input type="checkbox"/>				

ASSOCIATED COGNITIONS QUESTIONNAIRE

INSTRUCTIONS: Please answer the following questions about your ‘Associated Cognitions’ *currently or over the past week*. Your own statements are included in each question as a reminder of your Associated Cognitions.

Think about the “automatic thought” *from the second session*. As a reminder, you summarized it as “[participant’s own statement from ACS in Pre-IR session].”

1. Using the scale provided, please rate the extent to which you *currently believe* that “automatic thought”; that is, how *true* or *likely* it seems to you at this time.

0-----10-----20-----30-----40-----50-----60-----70-----80-----90-----100

Think about the “core belief about self” *from the second session*. As a reminder, you summarized it as “[participant’s own statement from ACS in Pre-IR session].”

2. Using the scale provided, please rate the extent to which you *currently believe* that “core belief about self”; that is, how *true* or *likely* it seems to you at this time.

0-----10-----20-----30-----40-----50-----60-----70-----80-----90-----100

Think about the “core belief about others” *from the second session*. As a reminder, you summarized it as “[participant’s own statement from ACS in Pre-IR session].”

2. Using the scale provided, please rate the extent to which you *currently believe* that “core belief about others”; that is, how *true* or *likely* it seems to you at this time.

0-----10-----20-----30-----40-----50-----60-----70-----80-----90-----100

Think about the “core belief about the world” *from the second session*. As a reminder, you summarized it as “[participant’s own statement from ACS in Pre-IR session].”

2. Using the scale provided, please rate the extent to which you *currently believe* that “core belief about the world”; that is, how *true* or *likely* it seems to you at this time.

0-----10-----20-----30-----40-----50-----60-----70-----80-----90-----100

Appendix I: *Drexel Defusion Scale* (DDS; Forman, Herbert, Juarascio, Yeomans, Zebell, Goetter, et al., 2011) + SA & AC items.

Drexel Defusion Scale (DDS)

Defusion is a term used by psychologists to describe a state of achieving distance from internal experiences such as thoughts and feelings. Suppose you put your hands over your face and someone asks you, “What do hands look like?” You might answer, “They are all dark.” If you held your hands out a few inches away, you might add, “they have fingers and lines in them.” In a similar way, getting some distance from your thoughts allows you to see them for what they are. The point is to notice the process of thinking as it happens rather than only noticing the results of that process, in other words, your thoughts. When you think a thought, it “colors” your world. When you see a thought from a distance, you can still see how it “colors” your world (you understand what it means), but you also see that you are doing the “coloring.” It would be as if you always wore yellow sunglasses and forgot you were wearing them. Defusion is like taking off your glasses and holding them several inches away from your face; then you can see how they make the world appear to be yellow instead of only seeing the yellow world.

Similarly, when you are defused from an emotion you can see yourself having the emotion, rather than simply being in it. When you are defused from a craving or a sensation of pain, you don’t just experience the craving or pain, you see yourself having them. Defusion allows you to see thoughts, feelings, cravings, and pain as simply processes taking place in your brain. The more defused you are from thoughts or feelings, the less automatically you act on them.

For example, you may do something embarrassing and have the thought “I’m such an idiot.” If you are able to defuse from this thought, you will be able to see it as just a thought. In other words you can see that the thought is something in your mind that may or may not be true. If you are not able to defuse, you would take the thought as literally true, and your feelings and actions would automatically be impacted by the thought.

Based on the definition of *defusion* above, please rate each scenario according to the extent to which you would normally be in a state of *defusion* in the specified situation. You may want to read through all the examples before beginning to respond to the questions. (Important: you are not being asked about the degree to which you would think certain thoughts or feel a certain way, but the degree to which you would *defuse* if you did.)

	Not at all	A little	Somewhat	(3) Moderately	(4) Quite a lot	(5) Very much
1 Feelings of Anger. You become angry when someone takes your place in a long line. To what extent would you normally be able to <i>defuse</i> from feelings of anger?	<input type="checkbox"/>					
2 Cravings for Food. You see your favorite food and have the urge to eat it. To what extent would you normally be able to <i>defuse</i> from cravings for food?	<input type="checkbox"/>					
3 Physical Pain. Imagine that you bang your knee on a table leg. To what extent would you normally be able to <i>defuse</i> from physical pain?	<input type="checkbox"/>					
4 Anxious Thoughts. Things have not been going well at school or at your job, and work just keeps piling up. To what extent would you normally be able to <i>defuse</i> from anxious thoughts like “I’ll never get this done.”?	<input type="checkbox"/>					
5 Thoughts of self. Imagine you are having a thought such as “no one likes me.” To what extent would you normally be able to <i>defuse</i> from negative thoughts about yourself?	<input type="checkbox"/>					
6 Thoughts of Hopelessness. You are feeling sad and stuck in a difficult situation that has no obvious end in sight. You experience thoughts such as “Things will never get any better.” To what extent would you normally be able to <i>defuse</i> from thoughts of hopelessness?	<input type="checkbox"/>					
7 Thoughts about motivation or ability. Imagine you are having a thought such as “I can’t do this” or “I just can’t get started.” To what extent would you normally be able to <i>defuse</i> from thoughts about motivation or ability?	<input type="checkbox"/>					
8 Thoughts about Your Future. Imagine you are having thoughts like, “I’ll never make it” or “I have no future.” To what extent would you normally be able to <i>defuse</i> from thoughts about your future?	<input type="checkbox"/>					
9 Sensations of Fear. You are about to give a presentation to a large group. As you sit waiting your turn, you start to notice your heart racing, butterflies in your stomach, and your hands trembling. To what extent would you normally be able to <i>defuse</i> from sensations of fear?	<input type="checkbox"/>					

10	Feelings of Sadness. Imagine that you lose out on something you really wanted. You have feelings of sadness. To what extent would you normally be able to <i>defuse</i> from feelings of sadness?	<input type="checkbox"/>					
----	--	--------------------------	--------------------------	--------------------------	--------------------------	--------------------------	--------------------------

Social Anxiety Items

11	Anxiety About Group Social Situations. You are preparing to go to a party and experience thoughts such as "I won't make a good impression" and "I won't be able to start and maintain conversations." To what extent would you normally be able to defuse from anxious thoughts about a group social situation?	<input type="checkbox"/>					
12	Anxiety About One-on-One Interpersonal Situations. You find yourself alone with a coworker or classmate whom you don't know well. This person says hello, and looks as if he or she want to talk. You experience thoughts such as "I won't have anything to say" and symptoms of anxiety such as a racing heart and flushing. To what extent would you normally be able to defuse from such anxious thoughts and feelings in one-on-one interpersonal situations?	<input type="checkbox"/>					

Based on the definition of *defusion* above, please rate each of *your own* thoughts/beliefs for how much you are in a state of *defusion* from the thought as you experience it. That is, how much you achieve internal distance from the thought.

			(3)	(4)	(5)	
	Not at all	A little	Somewhat	Moderately	Quite a lot	Very much
1	Automatic Thoughts: “[participant’s own content]”	<input type="checkbox"/>				
2	Core belief about Self: “[participant’s own content]”	<input type="checkbox"/>				
3	Core belief about Other People: “[participant’s own content]”	<input type="checkbox"/>				
4	Core belief about the World in general: “[participant’s own content]”	<input type="checkbox"/>				

Images and Early Memories Interview

1. THIS INTERVIEW should be audio taped so that it can be rated by a blind assessor.
2. *Italics* are instructions for interviewer and are not read aloud.

IMAGE (-)

To start, I'd like you to think about a social situation that makes you anxious, such as *[insert most anxiety-provoking situation]*. Can you close your eyes for a moment and imagine yourself in that type of situation? Tell me when you've got it. Okay, good. Now try to become aware of whether there is a mental image – the type of picture or impression we spoke about earlier – that comes into your mind when you enter or anticipate entering *[insert most anxiety-provoking situation]*? (***Give the participant some contemplative, quiet time to consider this.***)

I. IMAGE (-) FREE RECALL:

TIME Start: ____:____

Do you experience a mental image or picture of some sort when you enter or are anticipating *[insert social situation]*?

YES/NO

(If "yes," obtain description in FREE RECALL and then skip to GENERAL PROBE. Do not administer CUED RECALL).

Please describe that image to me in as much detail you can.

(If "no," skip directly to CUED RECALL)

II. IMAGE (-) CUED RECALL:

TIME Start:____:____

Although many people do report experiencing these sorts of images, some people do not. So, if you really believe you do not experience these types of images, please do let me know and we'll move on. Those people who do have these types of images often say that they are like pictures or snapshots of themselves behaving or appearing a certain way; or images or snapshots of interaction partners or audience observers; or even snapshots of landscapes or scenes that seem frozen in time. Do any of these sound familiar to you? Are you aware now of whether you might experience mental images when you are in anxiety-provoking social situations?

YES/NO

(If "yes," obtain description in CUED RECALL and then skip to GENERAL PROBE).

(If "no," skip directly to the positive image section)

III. IMAGE (-) GENERAL PROBE:

Is that everything you can access about the image or is there anything else that comes to mind? Please keep in mind that we need as many details as you can possibly envisage in the image.

TIME Stop: ____:____

IMAGE (-) SPECIFIC PROBES

- Do not ask these questions until all general probes have been asked.
- Remind the participant of the image (provide brief description from their recall & general probe. Also, remind the participant that we need as many details as she or she can report from the image.)

[Use the **participant's own words** to inquire about various aspects of the image. It is not necessary to ask any specific questions, but rather to follow up on key words that they mentioned during the previous portions of the interview. **Ask open-ended questions**].

Now, I would like to go back to the image we have already discussed, and I would like to ask you some specific questions about it.

TIME	# of Questions
Start: ____:____	
Stop: ____:____	

IMAGE (-) FOLLOW-UP QUESTIONS (for participants who endorsed having a negative image):

1. Approximately how old were you when you first began experiencing this image? _____
2. Does this image you just described typically come to mind when you're in these types of anxiety provoking social situations such as [*insert participant's most anxiety-provoking situation*]? In other words, is it a recurring image that always includes the same kinds of things?

YES/NO

3. Other than (*insert most anxiety-provoking social situation*), what other social situations make you nervous? Do you experience different kinds of images in these other types of social situations that make you nervous, or are these images always similar to the image you just described to me?

SAME/DIFFERENT (*if different, jot down a brief description below of themes in different images*)

MEMORY (-)

I. MEMORY (-) FREE RECALL:

Is there a particular event that happened at a specific time and place in your life that you can think of that may have led to the formation of the image we just talked about? Or can you recall the first time

you felt the way you feel in the image, or experienced something very reminiscent of the image? For now, please just answer “yes” or “no.”

YES/NO

(If “yes,” obtain description in FREE RECALL and then skip to GENERAL PROBE. Do not administer CUED RECALL).

(If “no,” skip directly to CUED RECALL)

If “YES”, ask how old they were when it occurred. _____

TIME Start:____:____ Stop:____:____

Can you tell me about that event now? Please describe the event in as much detail as possible. I will just sit here and listen until you finish telling me everything you can remember about that event.

II. MEMORY (-) CUED RECALL:

TIME Start:____:____ Stop:____:____

Although many people do report having these sorts of memories, some people do not. So, if you really believe you do not have any memory of this nature, please do let me know and we’ll move on. People who do have such memories often report specific memories of negative social experiences that happened to them. These negative events are often related to behaving inappropriately, appearing awkward, or making mistakes in front of others, and being judged negatively, criticized, or rejected by people you wanted to make a good impression on. Do you recall any of these types of experiences happening to you that might be related to the mental images that pop into your mind in anxiety-provoking social situations?

YES/NO

(If “yes,” obtain description in CUED RECALL and then skip to GENERAL PROBE).
(If “no,” skip directly to the positive image section)

III. MEMORY (-) GENERAL PROBE:

TIME
Start: ____:____
Stop: ____:____

Is that everything you can recall about the memory or is there anything else that comes to mind?
Please keep in mind that we need as many details as you can possibly remember.

MEMORY (-) SPECIFIC PROBES

- Do not ask these questions until all general probes have been asked.
- Remind the participant of the memory (provide brief description from their recall & general probe. Also remind the participant that we need as many details as he or she can remember)

[Use the **participant’s own words** to inquire about various aspects of the memory. It is not necessary to ask any specific questions, but rather to follow up on key words that they mentioned during the previous portions of the interview. **Ask open-ended questions**].

Now, let’s pay attention to the memory you described. I would now like to ask some specific questions about ... [briefly describe anxious memory]

Ask specific probe questions based on key words participants have provided.

TIME	# of Questions
Start: ____:____	
Stop: ____:____	

Appendix K: *Associated Cognitions Supplement to the WIMI (ACS)*

Introduce this module to the participant using the following script:

“For some people, memories of events like these contain important and possibly deep meanings. The next thing we’ll do together is to look for meaning that may be represented by the recurrent image and the memory we’ve identified. I’ll walk you through this process, using a technique that is often used in therapy. I will act as a guide, but what we find is up to you. Some people identify thoughts and meanings that go along with the memories, but others don’t. Just say what’s true for you. First, we’ll try to get a ‘snapshot’ of the thoughts that might go along with the image; then we’ll explore possible deeper significance represented by the memory. We’ll look for beliefs that might be ‘encapsulated’, or contained, in that event - beliefs about yourself, about other people, and about the world in general. If, as we proceed, you feel there is no underlying meaning present, we can move on to the next area. As the clinician, I’ll be helping you look for meaning, but if there does not seem to be a strong meaning there, I will ask you about that and we can move on.”

Recall the recurrent image described by the participant in part 1 of the WIMI. If they spontaneously disclosed an automatic thought (AT) that occurs along with the image, recall that thought and confirm that that is the most salient thought attached to the image; adjust if needed. If they did not spontaneously report an AT, ask them:

“When you experience this image, is there often a kind of thought that pops into your head along with it? In other words, what do you tend to find yourself thinking, or that you tend to think to yourself, as you experience this image?”

If they need further prompting, or don’t understand, you may clarify:

**“Is there something you are thinking in the memory? What are you thinking to yourself while....?”
“Is there a kind of central thought you might be having?”**

If they do not spontaneously report automatic thoughts occurring along with the memory and/or image, you may ask questions like these to elicit cognition:

“For example, some people might have a thought about themselves, or about other people in the situation; a specific concern might come to mind, or even a criticism... Is there a thought like this that seems to just come into your mind along with the image?”

If/once a thought is identified and articulated, tell the participant:

“We will call this the ‘Automatic Thought’ associated with the recurrent image. We’re giving it a name because we’ll refer to it later, in your next session, and also in some questionnaires. Let’s write it down so you can recall it easily.”

Write down the encapsulated belief. If a thought was identified, proceed as follows:

“Okay, so when that image comes into your mind, you think to yourself _____. Let’s look together to see if there’s a deeper meaning underneath that thought – let’s see if we can find something more about how you see yourself, or other people, or the world in general.”

Then using the participant’s words and the content of the memory, follow up on the verbal-cognitive-semantic aspect of their reported memory. If the memory contains automatic thoughts that are reported, look for meaning beginning with these thoughts, following the thread provided by the participant:

“And let’s suppose that were true/that would happen/etc, what would it mean to you?”

If the participant says something here to indicate that this would not mean anything important to them, end the questioning for this domain. If material is evident, continue:

“And let’s suppose that were true, what would it mean *about* you?”

If the participant does not generate a response to these questions, it can be assumed there is no associated core belief. Use great sensitivity in prompting to see *if* meaning is present; do not question in such a manner that the participant must generate a meaning.

If /once a core belief is identified, say,

“Okay, it seems we’ve found a pretty strong belief there. We’ll call this the *Core Belief*; we’ll call it “core” because it’s an underlying belief, something deep. Like with the Automatic Thought, we’re giving this a name because we’re going to return to it next session and some of the questionnaires will be about this belief. Let’s write it down so we can remember it.”

Make a note of the belief, in the exact wording that you have arrived at with the participant. Review the Automatic Thought and the Core Belief, to help them remember which is which.

Here, or in other inquiries, below, if the participant experiences emotional distress, general clinical skill must be used. Depending on the individual’s expression of distress, the following clinical skills may be deployed:

- Empathic listening and reflecting (e.g., “I see this is hard for you to talk about.”)
 - Normalizing (e.g., “It is quite normal to have an emotional response [or, to cry, etc.] when discussing feelings. That’s okay.”)
 - Providing hope (e.g., “It’s hard to lay this stuff out on the table. Next time, we’ll have a chance to actually help with some of these feelings.”)
-

If the participant reports that they do not have such spontaneous thoughts as discussed above, ask directly about the content of the memory/image:

“Reflecting on this memory, what does this memory say about *you*? What does it mean to you about yourself?” until arriving at an “absolute statement that seems unchangeable” (Greenberger & Padesky, 1995).

Check in with the participant about encapsulated meanings in the other domains (cover all three of self, others, and the world in general).

“We’ve looked into meaning about [yourself/other people/the world in general] embedded in this memory. Let’s think now if this memory represents to you something important about [yourself/other people/the world in general]. What do you think this experience taught you about [yourself/other people/the world in general]?”

And then explore for deeper meaning, using the same prompts:

“And let’s suppose that were true/that would happen/etc, what would it mean to you?”

If the participant say something here to indicate that this would not mean anything important to them, end the questioning for this domain. If material is evident, continue:

“And let’s suppose that were true, what would it mean *about you/others/the world*?”

As above, if the participant does not generate a response to these questions, it can be assumed there is no associated core belief. Use great sensitivity in prompting to see *if* meaning is present; do not question in such a manner that the participant must generate a meaning.

Appendix L: *Image/Memory/Cognition Summary Sheet (IMC Summary)*.

Summary of Today's Session

A. Image: _____

B. Memory:

1. Automatic Thought(s):

Core/Encapsulated Beliefs(s):

2. Self: _____

3. Others: _____

4. The World: _____

Appendix M: *Imagery Rescripting Protocol.*

Imagery Rescripting takes place during a single session, with the autobiographical memory content to be “rescripted” being derived from the Session 2 (WIMI + Beliefs) interview. Using the material identified in the prior session, the purpose of this brief intervention is to “contextualize and update” early memories – that is, revisit and intervene in the pivotal memory, incorporating new, imaginal content and outcomes for the event, and deriving new meaning. Whereas the control intervention condition, cognitive restructuring, is designed to *explicitly* “challenge the meaning of the early event and its implications for the present,” imagery rescripting is an experiential intervention from which new meaning may be derived, but which does not explicitly work to alter the identified cognition; new interpretations may derive implicitly from the re-experiencing and alterations of the memory event.

The participant “revisits” the pivotal memory that was identified in the previous session. The goal of rescripting is to “change the nature and thus the meaning of the memory within the imagery process itself” (Stopa, 2009).

The form of the intervention is as follows:

The recurrent image, pivotal memory, and associated AT and CB are reviewed.

The rationale for the intervention is provided:

“What we hope to accomplish today is to give you the opportunity to revisit the difficult event you described last time we met, and to work within the memory itself to change the meaning the event has for you. So what the technique looks like is that, almost like in a meditation, you’ll bring to mind that old experience. What we’ll be doing together is a technique that has been practiced as part of cognitive-behavioural therapy for helping with all kinds of early experiences and troubling symptoms. I’ll walk you through all of this as we go, and we’ll explore the details of the event, as well as bringing new information into the memory. We don’t need to think ahead; we’ll just get ready to begin, and I will help guide you through the experience. Do you have questions before we begin?”

“It is often easiest for people to concentrate if I sit to your side, so no-one is across from you. It’s often helpful to dim the lights just a little bit. Would you prefer that? Many people find it helpful to close their eyes so that they can imagine the scene without distraction from the present; it’s up to you if you’d like to do this, and you can open or close your eyes as you wish. If you don’t want to close them, it might help to gaze toward the floor. Either way, you and I don’t need to maintain eye contact.

“So let’s begin by having you recall the memory as though you are immersed in it right now. Bring the event to mind, and describe to me in as much detail what you are seeing and hearing, and what it’s like – again, as though you are really there.”

Encourage them to speak in the present-tense, using the first person (i.e., “I see...” rather than “there was...” etc.). After, or along with, providing sensory details of the event, if they do not spontaneously report what is happening in the memory, go on to prompt them:

“And what is happening? How are you feeling? What are you thinking?” Elicit information about who is present, what happened sequentially, and so on. Once the event has been fully elaborated and ‘relived’, go on to the next stage.

“Now what we will do is have you visit that same scene you just described, but as your current, adult self. I want you to observe the scene, but remain on the sidelines, and describe to me what you are seeing, and what unfolds in front of you.” Elicit the participant’s thoughts and feelings, as well as the episodic details they observe. It can be helpful to draw their attention to salient features, such as the look on the face of their earlier self, to access interpretations and underlying emotions. Once they have described fully their current experience when ‘observing’ the past event (and if they have not already done so spontaneously), you may ask them what they would like to do to intervene in the situation, to change what is happening, or the like. It is important that the participant generate their own idiosyncratic actions and resolutions. The participant is encouraged to intervene in whatever way(s) they feel compelled; they may try multiple actions, and may focus their efforts at interactions with others in the scene and/or their prior self. Before moving on, the researcher/therapist makes sure the participant’s intervention is complete. [From Arntz & Weertman, 1999: Main questions of phases 2 and 3: What happens? What do you see? What are you feeling? What are your thoughts about this? What are you inclined to do? Okay, do it... (Repeat sequence until it is OK.)]

In the final phase of the intervention, the participant again assumes the role of the prior self:

“Good work [or other encouragement]. Now what I want you to do is again assume the perspective of your earlier self in the scene, but this time experience the scene as you just did, with your current self [intervening – but use language to describe what the current self did; e.g., “standing up for you”]. Describe to me what happens, and what you think and what you feel.” Once they have described this, ask, *“Is there anything more your earlier self would like from you, or would like for you to do to make things feel [better]? If so, let that play out now – have your current self give you anything else you needed in that moment.”*

Once they have completed these stages fully:

“You have done some excellent work here. Now let’s do one more thing, to tie together these new thoughts and conclusions. You reported having a recurrent image. How might your image change, in light of this new perspective?”

Once the exercises are complete, use the template provided (Appendix O) to write new/replacement interpretations, and image.

“Now your ‘homework’ over the next week is to think about what you’ve done in here today, and what you’ve learned, and see how it might apply to various situations you encounter. In other words, try to integrate the work you did in here today into your life in the real world over the coming week.”

Once the exercises are complete, use the template provided (Revised IMC Summary; Appendix O) to write new/replacement beliefs, interpretations (to ATs). Enter this information into the electronic version of the document immediately following the session.

Appendix N: *Revised Image/Memory/Cognition (IMC) Summary Sheet.*

Post IMB Summary

A) Event:

B) Image:

1.a) Automatic Thought(s):

Core/Encapsulated Belief(s):

2.a) Self:

3.a) Others:

4.a) World:

Updated Perspective:

Updated Image:

1.b) Updated Interpretation(s):

Updated Core/Encapsulated Belief(s):

2.b) Self:

3.b) Others:

4.b) World: