

**COUNTERFACTUAL THINKING AND REPETITIVE THOUGHT IN SOCIAL
ANXIETY**

by

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Abstract

Counterfactual Thinking and Repetitive Thought in Social Anxiety

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Research suggests that those experiencing Social Anxiety (SA) symptoms are more likely to engage in repetitive thought (RT), including upward counterfactual thinking (U-CFT). Findings indicate that these cognitive patterns may lead to deleterious thoughts and emotions, particularly when U-CFT focuses on non-repeatable, uncontrollable situations and negative self-appraisals. The present dissertation consisted of two complementary studies. Study 1 attempted to 1) validate new measures of state and trait U-CFT, 2) examine the relationship between U-CFT and established measures of RT and mood, and 3) explore the relationship between SA symptoms and counterfactual thinking within a student population. Results indicated that the U-CFT-S (trait measure of U-CFT) and the Counterfactual Likelihood scales (state measure of U-CFT) evidenced sound psychometrics in terms of internal consistency, factor structure, and relationships with related questionnaires. Factor analyses revealed that the Maladaptive U-CFT-S scale clustered with negative mood, rumination, and learned helplessness, while the Adaptive U-CFT subscale clustered with measures of positive mood and self-efficacy. Finally, symptoms of SA correlated positively with state and trait U-CFT generation. Study 2 1) compared patterns of

U-CFT and emotions such as guilt and self-blame between a diagnosed Social Anxiety Disorder (SAD) group and a Healthy Control (HC) group 2) determined if disorder-specific content impacts U-CFT generation, and 3) piloted a brief, CBT-based, video intervention targeting maladaptive U-CFT. Results indicated that the SAD group evidenced higher amounts of U-CFT in response to the socially-based scenarios than the HC group and in response to social than non-social scenarios. The SAD group evidenced higher levels of unhelpful emotions (e.g., guilt) both pre- and post-CFT generation than HC participants. Finally, the CBT intervention was generally unsuccessful at reducing maladaptive U-CFT, but was more likely to be effective among SAD than HC participants. Implications of this dissertation include: 1) the benefit of including state- and trait-based measures of U-CFT in future research, 2) the importance of conceptualizing U-CFT as a multifaceted construct, 3) addressing that those with SAD are engaging in maladaptive U-CFT and experiencing consequent guilt and self-blame, and 4) the direction of creating more comprehensive, brief interventions aimed at targeting maladaptive U-CFT.

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Counterfactual Thinking and Repetitive Thought in Social Anxiety

Social Anxiety Disorder is characterized by strong and persistent fears of being judged (and consequently embarrassed or humiliated) in social situations, and results in discernible avoidance of such social-evaluative contexts. Those high in social anxiety typically enter social situations with the belief that they are at imminent risk of behaving ineptly and that their actions will lead to upsetting social consequences, such as rejection from others (Rachman, Gruter-Andrew, & Shafran, 2000). Further, socially anxious individuals tend to employ unhelpful and distress-inducing cognitive strategies (e.g., distorted interpretation and memory) when evaluating past social situations they have experienced (Rachman et al., 2000). Indeed, social anxiety symptoms are believed to be maintained largely by maladaptive cognitions (e.g., Clark & Wells, 1995; Rachman et al., 2000); that is, the typical thinking patterns of socially anxious individuals work to exacerbate their symptoms and related distress.

Specifically, maladaptive cognitive patterns appear to be essential, maintaining factors of Social Anxiety Disorder (SAD), rather than simply epiphenomena of being in a socially anxious state (e.g., Clark & Wells, 1995; Hoffman, 2007; Mills, et al., 2014; Rapee & Heimberg, 1997). As such, the understanding of these critical cognitive processes is essential for better conceptualizing SAD and for informing treatment of the disorder. For instance, Hoffman (2007) presented a model of the cognitive factors that appear to maintain SAD. He noted that those with SAD experience anxiety and discomfort in social situations partly because of their perceptions of others' standards for them (i.e., high social standards) and a related desire to behave adeptly combined with a belief that this goal of social prowess cannot be achieved. Such beliefs and perceptions, in turn, augment apprehension and self-focus in social contexts, which then initiate

several other cognitive processes. These include the exaggeration of the probability of negative social outcomes and perceptions of lack of emotional control and social skills which work to foster the anticipation of social “disasters” and can lead to avoidance, safety behaviors, or great discomfort in social contexts. Such behaviours often bring about post-event rumination (e.g., a repeated mulling over of one’s social mistakes), which can then maintain or augment the individual’s apprehension in subsequent social situations (Hoffman, 2007). Likewise, Rapee and Heimberg (1997) propose a model of SAD in which cognitive processes and tendencies (e.g., attention to threat and internal cues, self-focus, comparisons (e.g., expectations versus performance), and overestimation of failure probability) characterize and maintain the disorder. Thus, processes of perceptions, beliefs, attributions, and rumination do not simply correlate with the presence of SAD, but rather work in tandem to ensure that the disorder persists.

This notion can be further supported by the findings that cognitive behavioural therapy (which focuses on addressing and modifying maladaptive cognitive patterns) leads to greater treatment response than do other non-cognitive-based therapies. For example, Stangier and colleagues (2011) conducted a randomized controlled trial that found larger response rates (e.g., percentage of participants who no longer met diagnostic criteria for SAD) in the CBT group (misleadingly labeled as “Cognitive Therapy” by the authors, as it did include behavioural elements), than an interpersonal therapy group (IPT; which focuses on evaluating and altering one’s social environment and relationships) among patients with an initial SAD diagnosis. Thus, the attenuation of maladaptive cognitive patterns appears to be crucial in the expedient and effective treatment of SAD. As such, a better understanding of these processes is an essential step in the further conceptualization and treatment of the disorder.

Role of Cognition in Social Anxiety: Post-event Processing

In light of the range of important cognitive processes in SAD, the specific focus of the current study is on the process of post-event rumination. One particularly important type of thought process that falls under this umbrella is that of post-event processing (PEP). Introduced by Clark and Wells (1995), PEP follows an event and is defined as “the period of reflection on actual or perceived inadequacies, mistakes, imperfections, and the like” (Kocovski, Endler, Rector, & Flett, 2005, p. 972). Indeed, the relationship between SAD and PEP has been replicated in several studies (e.g., Dannahy & Stopa, 2007; Laposa et al., 2014; Mellings & Alden, 2000; Rowa et al., 2014). Hoffman (2007) notes that when engaging in PEP, individuals with SAD often focus on negative evaluations of the self, often recalling the social event as more “disastrous” than it truly was. Research supports the notion that socially anxious individuals (1) spend a great deal of time thinking about social events perceived as unsatisfactory, (2) experience such cognitions as intrusive, and (3) often have difficulty concentrating due to these distressing thoughts (Rachman et al., 2000). PEP has been found to be distinct from the obsessions hallmark to Obsessive-Compulsive Disorder (OCD), in that while the content of classic obsessions is typically repulsive or horrifying, the intrusive thoughts experienced by those with social anxiety are more shameful and embarrassing (Rachman et al., 2000). Further, while everyone may engage in PEP to an extent, it appears that for socially anxious individuals, such thoughts tend to exponentially worsen levels of anxiety. Conversely, PEP does not appear to have deleterious effects for those low in social anxiety (Rachman et al., 2000). Additionally, when asked to reflect on the occurrence of PEP following a stressful social event that took place on the previous day, those with social anxiety report much greater frequency and duration of PEP engagement than do non-socially anxious individuals (Mellings & Alden, 2000). Thus, it appears

that social anxiety may be related to a tendency to repeatedly focus on and evaluate the details of past social events in which social performance was judged to be inadequate.

Counterfactual Thinking

One form of cognitive processing that frequently follows events perceived to be negative is counterfactual thought (e.g., Roese, 1994; Sanna, Chang, & Meyer, 2001; Wells, Taylor, & Turtle, 1987). Counterfactual thoughts are simulated mental alternatives to past negative outcomes, and can be categorized into either downward counterfactual thoughts (“At least...” thoughts that imagine a worse possible outcome) or upward counterfactual thoughts (“If only...” thoughts that imagine a better possible outcome). While downward counterfactuals are generally linked to positive mood (and often mood repair) following an unpleasant outcome, upward counterfactuals are closely linked to the experience of negative mood (e.g., Allen et al., 2014; Sanna, Turley-Ames, & Meier, 1999).

Although upward counterfactual thinking typically produces negative mood states, research in this area also suggests that upward counterfactuals have the capacity to be adaptive and functional because they enhance motivation for self-improvement (e.g., Epstude & Roese, 2011; Roese, 1994; Sanna, Chang, & Meier, 2001). For instance, if someone fails an important examination, they may think: “If only I had studied harder, I would have passed the course.” Although this thinking may initially induce negative feelings of guilt and regret, such thoughts may increase the likelihood that this individual will prepare more thoroughly for examinations in the future. Indeed, Roese (1994) found that upward counterfactual thinking (U-CFT) was related to augmented intentions to perform more adaptive behaviours in the future and experimentally demonstrated that previous U-CFT did lead to a greater likelihood of actually carrying through with these intended adaptive behaviours. The finding that upward counterfactuals lead to

subsequently improved performance has likewise been demonstrated in more recent studies (e.g., Myers et al., 2014). From this perspective, then, the negative affect induced by upward counterfactuals soon diminishes after a negative event, and may encourage some form of intention towards self-improvement.

Upward Counterfactual Thinking and Problem-Solving

One such mode of self-improvement following U-CFT may be via increases in problem-solving and coping behavior. That is, “If only...” thinking may not only generate alternative course of action, but may also impact the adaptiveness and effectiveness of how such plans of action are carried out in the future. Indeed, Ruiselova and colleagues (2009, p. 237) define CFT in a way that makes problem-solving an inherent element, stating that “[c]ounterfactual thinking... can be explained as thinking about unrealized alternatives of daily problem solving.” Thus, U-CFT may be prompted by potentially failed attempts at effective problem-solving and may, in turn, encourage alternative problem-solving behaviours in the future. For example, Bratska (2009) found that those who were prompted to employ U-CFT during a previous training session were more likely to report that they view obstacles as challenges (rather than problems), take initiative rather than remaining passive when faced with obstacles, and appreciate creative problem-solving strategies more so than those who did not undergo the U-CFT training prompts. Additionally, Ruiselova and Prokopcakova (2010) found positive correlations between proactive coping strategies, levels of self-efficacy, and beliefs about the helpful nature of CFT in assisting with future problem-solving tasks.

Further, Markman, Lindberg, Kray, and Galinsky (2007) examined the effect of U-CFT generation problem-solving. They found that upward CFT was related to an increase in performance on a subsequent analytical problem-solving task. Moreover, Markman, McMullen,

and Elizaga (2008) found that the relationship between U-CFT and performance on a subsequent task was accounted for by augmented levels of persistence and strategic thinking. Thus, U-CFT appears to lead to increased performance on subsequent related tasks, possibly due to the effect of U-CFT on persistence and forms of critical thinking.

For Whom May U-CFT be a Maladaptive Process?

Despite this functional aspect of upward counterfactual thinking (i.e., problem-solving, coping, self-improvement), a growing body of research suggests that for individuals with various forms of psychopathology, upward counterfactuals may produce negative mood in the absence of any beneficial, motivational consequences. For instance, Roese (1997, p.144) argues that upward counterfactual thinking can become maladaptive when such thinking “is not shut down normally but spins repeatedly into unhealthy ruminations.” Further, when significant levels of psychopathology are present, “if only...” thoughts may work to exacerbate anxiety- and depression-related symptoms. For instance, Markman and Miller (2006) found that participants who were severely depressed (as compared with those with mild to moderate depression) generated upward counterfactuals that were less reasonable, less controllable, and more characterological in nature. Thus, severely depressed individuals generated U-CFT that focused on aspects of the event that were unforeseeable and based on negative, enduring characteristics of the self. In turn, these unreasonable counterfactuals were related to subsequently diminished perceptions of control over this past event, as measured by self-report. Moreover, Callander, Brown, Tata, and Regan (2007) examined the correlates of counterfactual thinking in women who had experienced repeated miscarriages. These researchers found that within this sample, upward counterfactual thinking was associated with greater levels of anxiety, low mood, and

general distress, thus suggesting a potential maladaptive function of U-CFT within a sample of women who had experienced repeated traumatic events.

Further, Ruiselova, Prokopcakova, and Kresanek (2009) attempted to uncover clusters or configurations of personality, well-being, CFT tendencies, and problem-solving in a sample of female nurses. Using configural frequency analysis (CFA), they found two “types”. The first rarely engages in U-CFT but when U-CFT happens, it does not lead to sadness and does not inhibit future problem-solving. In fact, for this “type,” U-CFT was correlated with enhanced future problem-solving and with higher levels of well-being. The second “type”, however, is characterized by high levels of anxiety and by frequent U-CFT that leads to sadness and does not aid in future problem-solving. In fact, U-CFT for this group (as measured by self-report) often inhibits problem-solving, the development of future solutions, and coping for these women. The authors argue that this type hones in more on the emotional function of U-CFT, which may be linked to emotional problem-solving. Emotional problem-solving strategies have been related to high levels of neuroticism and to less effective problem-solving implementation (e.g., less favourable outcomes; Boyes & French, 2010); thus, it is important to consider that U-CFT, for some individuals (e.g., those who are anxious), may be associated with problem-solving strategies that are not adaptive or effective. This finding presents an interesting exception to the literature outlined above, which purported that U-CFT generation works to facilitate and encourage effective problem-solving behaviours. Thus, for some individuals, particularly those who are highly anxious, U-CFT may lack the adaptive function that is typically observed in healthy individuals.

Additionally, Kocovski and colleagues (2005) found that undergraduates high in social anxiety (as compared with low SA individuals) generated more negative thoughts in general and

more upward counterfactual thoughts specifically in response to a scenario that involved making mistakes and being embarrassed in front of others. Indeed, Kocovski and colleagues had predicted this finding, as U-CFT generation has been shown to follow perceived failure (e.g., Roese, 1994) and because those with social anxiety are more likely to view unsatisfactory social experiences as “failures,” thus prompting a U-CFT reaction. Further, Monforton and colleagues (2012) found that those highest in social anxiety symptoms, as compared with low levels of symptoms, generated a greater proportion of U-CFT following a stressful social scenario. In this study, the general tone of the scenarios presented to participants was negative (which resulted in significant increases in negative mood after reading the vignettes); however, the scenarios also featured ambiguous and positive elements, such that there was opportunity for the generation of “At least...” downward counterfactuals as well. Despite this, the high social anxiety group evidenced a much greater propensity to respond with “If only...” thoughts following these scenarios. Thus, the increased readiness or availability of U-CFT following a stressful event in socially anxious individuals may lead to more frequent negative mood in this group, though further experimental research is needed to test this prediction (Monforton et al., 2012).

Overall, there is reason to believe that upward counterfactuals may be used in maladaptive ways by those who are experiencing anxiety and/or depression, and that such self-defeating cognitive patterns occur in those with moderate to severe levels of social anxiety (e.g., Kocovski et al., 2005; Monforton et al., 2012).

What Resultant Emotions may lead to U-CFT as a Maladaptive Process?

U-CFT, Regret, and Guilt. As outlined above, one’s individual characteristics are hypothesized as one factor that may lead to maladaptive U-CFT. Additionally, specific emotional consequences of upward counterfactual thinking might also indicate instances when “If only...”

thinking may be unhelpful and detrimental to well-being. One such resultant emotion of U-CFT (particularly when strong and persistent) is regret. Regret is defined as a negative emotion experienced when imagining that the current situation would have been more favourable if only one had employed different decision-making in the past (van Dijk & Zeelenberg, 2005). Closely related to regret is the experience of guilt, defined as “a feeling of having committed wrong or having failed in an obligation” (New Oxford Dictionary, 2001, p. 817, as cited in Mandel & Dhami, 2005, p. 628). Thus, while regret and guilt are largely similar constructs, regret focuses on the relationship between (typically negative) outcomes and one’s actions, whereas guilt hones in on wrongdoing and failure more specifically. A large body of literature has confirmed that regret and related guilt are common reactions as a result of U-CFT (e.g., Mandel, 2003; Petrocelli et al., 2011; Ruiselova et al., 2009; van Dijk & Zeelenberg, 2005). Indeed, it is easy to imagine that a thought such as “If only I had been wearing my seatbelt” could lead to the experience of regret, especially in light of any deleterious consequences of not performing that adaptive behaviour (e.g., injury). Likewise, someone who thinks “If only I had not...” might subsequently experience guilt feelings.

While the experience of guilt and regret may motivate some to improve their actions in the future (as does the general experience of negative affect, discussed above), it is also possible that the experience of these emotions as a result of U-CFT may become a maladaptive process in which these difficult emotions exacerbate anxiety and low mood, interfering with problem-solving and self-improvement initiatives. For instance, Branscombe and colleagues (2003) found that a higher frequency of U-CFT in women who had been raped was associated with lower levels of well-being, a relationship that was fully mediated by the presence of guilt and self-blame. Specifically, Branscombe and colleagues (2003) used a Structural Equation Model to

examine the relationship between U-CFT, self-blame, and well-being in females who had been sexually assaulted. They found that U-CFT significantly predicted self-blame and that, in turn, self-blame predicted (in a negative direction) participants' levels of psychological well-being. Further, self-blame had a negative effect on participant's current perceptions of control over their sexual assault.

Additionally, Mandel and Dhami (2005) found that prisoners who were instructed to think counterfactually (e.g., generate upward counterfactual thoughts) about past negative events (as opposed to thinking factually about these situations) expressed higher levels of guilt and that this relationship between guilt and CFT was fully mediated by reported self-blame. Thus, it appears that an upward counterfactual mindset (e.g., "If only I had done this differently, things wouldn't have turned out so badly") works to amplify guilt and self-blame more so than the task of recalling past negative events in a factual nature (e.g., "What I did was wrong and that's why things turned out badly").

Despite this notable literature on the relationship between U-CFT and regret, no such investigations have been conducted specifically with a social anxiety population. As such, the current study represents a new direction of investigation, building upon the notion that individuals with psychopathology may experience notable levels of regret and guilt following U-CFT generation in the absence of any adaptive, self-improvement consequences.

In What Conditions Might U-CFT be a Maladaptive Process?

In addition to the consequent emotions (e.g., prolonged negative mood) and individual differences (e.g., the presence of psychopathology) that might render U-CFT a maladaptive process, some researchers have postulated that the content of the scenario that prompts U-CFT may also determine whether the upward counterfactual process is adaptive or deleterious (e.g.,

Branscombe et al., 2003; Callender et al., 2007; Markman & Weary, 1996; Ruiselova et al., 2009). For instance, the controllability and repeatability of a negative outcome may influence whether subsequent “if only” thoughts are more likely to be adaptive and self-enhancing versus maladaptive.

Control. One element of a scenario that may impact the adaptiveness of subsequent U-CFT is the amount of control that the individual had over the negative outcome (e.g., Callender et al., 2007; Markman & Miller, 2006; Markman & Weary, 1996; Roese & Olson, 1995; Ruiselova et al., 2009). That is, if one had a reasonable amount of control over an undesired event (e.g., poor performance on a test due to inadequate studying), then related U-CFT (“If only I would have studied longer”) may highlight the actor’s personal control over the event and lead to more adaptive behaviours in the future (e.g., studying more carefully). Indeed, Ruiselova and colleagues (2009, p. 239) argue that a central aspect of U-CFT is a sense of controllability over the outcomes of a situation, highlighting that U-CFT should focus on “personal manipulability”, the ability to mentally alter one’s past actions in order to imagine a different outcome and perhaps realize this different result in similar situations in the future.

If a negative outcome is largely uncontrollable, however, it is less likely that engaging in U-CFT afterwards would lead to self-improvement. For instance, in an extreme example, if someone were to get hit by lightning out of the blue on a sunny day, it may be difficult to imagine how they could have behaved differently to avoid this negative outcome. Thus, “If only I had...” thoughts may be hard to come by. If such thoughts were to be generated, they might be highly unreasonable (e.g., “If only I had been psychic and predicted this would happen”) or based on personal characteristics (e.g., “If only I weren’t such an unlucky person”). In both of these examples, the “If only...” statements would be unlikely to lead to any personal growth or

enhanced problem-solving. As such, they may produce negative affect in the absence of any adaptive, self-improvement function. This concept can be related back to the recent study by Callander and colleagues (2007), which found that for women who experienced repeated miscarriages (highly distressing events largely out of their control), increased U-CFT led to negative affective outcomes. Although it is intuitive that the negative affect induced by experiencing a miscarriage may facilitate upward counterfactual thinking, this thinking may not have an adaptive function because these expectant mothers did not have a great deal of control (if any) over the negative outcome in question. Further, as mentioned earlier, Branscombe and colleagues (2003) found that for victims of sexual assault, U-CFT was related to lower levels of well-being (as mediated by self-blame) and that this self-blame was associated with lowered perceptions of control over their trauma. Even though one would expect self-blame to increase perceptions of control (e.g., self-blame is typically present when one feels they could have done something differently, thus augmenting the idea of personal control over the event), perhaps this was not the case in this instance because sexual assaults are uncontrollable and non-repeatable events. Thus, “If only I had...” statements led to diminished control because there was no realistic alternative course of action for the victims to take during the assault. Overall, it is postulated that increased sensations of self-blame do not, and likely cannot, promote perceptions of personal control in such scenarios and, as such, consequent U-CFT work more singularly induce negative affect and magnify a sense of self-blame

Repeatability. As with controllability, the repeatability of a distressing scenario may also affect whether subsequent U-CFT is helpful or maladaptive. In particular, U-CFT is typically seen as adaptive when there is a chance for one to learn from one’s mistakes (via “if only...” thoughts and subsequent problem-solving) and apply more useful behaviours in the

future (e.g., Markman & Weary, 1996; Roese, 1994). Markman and Weary (1996) explain that an event with a high likelihood of re-occurrence presents one with the chance to improve upon an outcome the next time such a situation arises and should stimulate U-CFT generation. When a stressful event is isolated and unique, however, U-CFT is less likely to prompt effective problem-solving because the individual is unlikely to subsequently experience a similar event. Branscombe and colleagues (2003) argue that when someone does not anticipate that an event will be repeated, upward counterfactual thinking should not result in general preparedness for future stressful events. As such, in the context of a distressing event that is unlikely to occur again, the preparative, self-improvement function of U-CFT is unlikely to compensate for the negative mood that is likely to result from these thoughts (Branscombe et al., 2003). For instance, to return to the previous example, the idea of being struck by lightning randomly on a sunny day represents a situation that is highly unlikely to ever happen again. Because this event will not be repeated, subsequent “If only...” thinking that focuses on one’s own behaviour (e.g., “If only I would have not left the house that day”) is not likely to lead to effective problem-solving, increased preparedness, or, in general, learning from one’s mistakes.

Further, there may be an interaction between individual characteristics and the tendency to generate U-CFT following an uncontrollable or non-repeatable event. Ruiselova and colleagues (2009) posit that highly anxious people prefer to use U-CFT as an emotional coping strategy (rather than one related to problem-solving or self-improvement) and that this process is likely to transpire following situations that are irreversible, controllable, and difficult to influence. They add that this U-CFT strategy (e.g., using U-CFT to cope emotionally with a distressing, uncontrollable event) is only effective in the short-term. If this strategy persists, however, U-CFT may develop into a more chronic pattern of rumination, which may be

considered a maladaptive coping mechanism (Ruiselova et al., 2009). Additionally, Markman and Weary (1996) found that moderately depressed individuals were more likely to generate controllable U-CFT (those relating to their own actions) following a non-repeatable scenario than were non-depressed participants. In such a situation, depressed individuals may be able to realistically see what they could have done differently, though the negative affect (notably guilt) following such thoughts may not be adaptive in that it cannot be converted in motivation or intentions to behave similarly in the future, since the event was isolated (Markman & Weary, 1996).

Thus, the presence of psychopathology such as depression (e.g., Markman & Miller, 2006) and social anxiety (e.g., Kocovski et al., 2005; Monforton et al., 2012) may interact with situation characteristics (e.g., controllability, repeatability) to set the stage for maladaptive, unhelpful U-CFT generation that leads to prolonged negative affect in the absence of self-improvement and problem-solving motives and opportunities.

U-CFT and Repetitive Thought

One potentially relevant construct to the study of U-CFT is that of repetitive thought (RT). RT is conceptualized as a transdiagnostic phenomenon (e.g., present across clinical disorders, not specific to one particular diagnosis) and is defined as the process of having attentive, repetitive, or frequent thoughts that focus on one's self, environment, and life circumstances (McEvoy et al., 2010; Watkins, 2008). RT has been indicated as a core element in the development and maintenance of a number of disorders (particularly mood- and anxiety-related pathology). RT, like U-CFT, may have both constructive and unconstructive effects and consequences (Watkins, 2008). For instance, positive consequences of engaging in RT include effective preparation and planning, and problem-solving for future events and engaging in

adaptive health behaviours (Watkins, 2008). In support of the maladaptive sequelae of RT, a review paper by Watkins (2008) found that the literature has demonstrated a reliable link between RT and vulnerability to both depression and anxiety.

In relation to the current line of research, post-event processing (PEP) has been included as a relevant construct under the RT umbrella (Watkins, 2008). Indeed, PEP is a cognitive pattern characterized by frequent and repeated reflection on one's perceived social missteps and incompetence and has been indicated as a common process for those with notable social anxiety (e.g., Clark & Wells, 1995; Kocovski et al., 2005; Rapee & Heimberg, 1997). As noted previously, counterfactual thinking has been classified as a form of PEP and arguably belongs among the collective of key RT phenomena. Watkins (2008) classifies CFT as such, noting the relationship between U-CFT and negative mood and outlining both constructive (e.g., promoting adaptive future behaviour, generating causal inferences) and unconstructive consequences of U-CFT (e.g., emotions such as shame, guilt, regret, anxiety), mirroring the review presented in the previous paragraphs of the current paper. As such, it may be useful to consider the construct of RT within the context of the current research, as a way to more clearly conceptualize U-CFT as a transdiagnostic (or perhaps as a more disorder-specific) phenomenon and to allow for the better understanding of the relationship between U-CFT and other prevalent RT processes.

The Relation to Rumination

Rumination is one of the most frequently studied and noted forms of RT and has evidenced key relationships with both social anxiety and CFT. Rumination, particularly depressive rumination, a construct honed by Nolen-Hoeksema (1991), is defined as a cognitive and behavioural process that focuses attention on one's current depressive symptoms and on the consequences and meaning of these manifestations of depression. Nolen-Hoeksema and

colleagues (1997) have specified that rumination is a passive and repetitive process that is prevalent among individuals experiencing notable depressive symptoms. Although largely considered a mood disorder-relevant phenomenon, rumination has also been found to be a key process in anxiety disorders (e.g., Rector et al., 2008). As noted above, rumination has been linked to both social anxiety specifically and to counterfactual thinking in the literature (e.g., Kocovski & Rector, 2007; McEvoy & Perini, 2009; Morgan & Banerjee, 2008; Vassilopoulos, 2008). For example, Kocovski and colleagues (2005) found that those high in social anxiety symptoms were more likely to engage in ruminative coping than those lower in social anxiety symptoms. Further, Wong and Moulds (2009) have reported that rumination (as compared with distraction) better maintained social anxiety-related symptoms in participants both high and low in social anxiety. Moreover, researchers such as Hofmann (2007) and Field and Cartwright-Hatton (2008) have posited that rumination following negative social events is a typical response demonstrated by those with SAD and suggest that rumination should be included in the overall cognitive model of the disorder, as it appears to both predict and help maintain symptoms of SAD.

In terms of the relationship between rumination and CFT, it is important to first clarify that these constructs represent distinct cognitive processes. Specifically, rumination focuses on events that have actually transpired, while counterfactual thoughts are imagined, alternative hypothetical outcomes to an actual event. Despite this difference, however, it is also likely that a general tendency to ruminate on past events may be associated with a propensity to perseverate on how things could have turned out differently. Indeed, Epstude and Roese (2008) explain that CFT may adopt a ruminative quality when it focuses on actions outside of one's control (e.g., focusing on how one could have avoided an accident in which the other driver was totally at

fault), thus preventing a solution or plan that would terminate the line of thinking. Here, like rumination, upward counterfactual thinking can become repetitive and seemingly devoid of any adaptive function.

As noted by McEvoy and colleagues (2010), there has been a dearth of research examining the relationship between PEP (including CFT) and other forms of repetitive thought. Accordingly, the current dissertation will examine the phenomenon of CFT within the context of RT in order to better understand how CFT relates to other key RT variables in both clinical and analogue samples.

The Current Dissertation- Study 1

Study 1 first examined the phenomenon of U-CFT and related constructs within a non-clinical undergraduate population. Overall, this initial study explored the phenomenon of U-CFT in a healthy, non-pathologically anxious population and attempted to answer the following questions:

1. How does a healthy, non-anxious individual use U-CFT in response to a stressful scenario?
2. How does U-CFT relate to other key cognitive variables among a non-clinical, student sample?
3. How does the presence of sub-clinical social anxiety symptoms relate to U-CFT and other cognitive processes in a healthy sample?

This study was designed to complement the second study (Study 2, outlined below) in that its findings, based on non-clinical undergraduates, might clarify the relationships among key constructs and how such overlap may be similar or different among a clinical sample.

Specifically, this study determined the relationship and amount of intercorrelation between upward counterfactual thinking and other potentially associated cognitive phenomena (such as those under the ‘repetitive thought’ umbrella), including worry, rumination (particularly self-focused rumination), post-event processing, learned helplessness, and locus of control, in a healthy, non-anxious, student population. Further, this study examined the relationship between the presence and severity of Social Anxiety symptoms and other constructs of interest, including U-CFT, rumination, problem-solving, worry, and insomnia. Additionally, the present study looked at how those high in social anxiety symptoms and those low in social anxiety symptoms differ in their U-CFT responses to a negative, uncontrollable, non-repeatable scenario and how

the U-CFT generated correlate with the cognitive phenomena of interest (e.g., rumination, worry, problem-solving).

In addition to the RT and related variables discussed above, problem-solving was of particular interest in the current study because it (along with many of the other variables assessed here) has been classified as a potentially important form of repetitive thought (e.g., Watkins, 2008) and, as previously outlined, has been identified as a construct significantly affected by U-CFT (Markman et al., 2007). Also included in this study were measures of Learned Helplessness and Locus of Control, as it is possible that feelings of helplessness and a lack of agency may impact participants' CFT responses and ratings of problem-solving. Indeed, as discussed above, perceived control (potentially contrasted with feelings of helplessness) has been identified as a key component in subsequent CFT generation (e.g., Markman et al., 1995). While levels of self-efficacy have been examined in regards to the functionality of U-CFT (e.g., Sanna, 1997), the current investigation is the first to investigate the relationship between U-CFT and learned helplessness in particular.

Finally, Study 1 involved an opportunity to pilot two new measures of counterfactual thinking among an undergraduate sample. The first was a Counterfactual Likelihood measure with two versions. Specifically, following the presentation of a stressful scenario and the opportunity to generate CFT that come to mind (specific methodology outlined below), participants responded to the CFT Likelihood measure, which listed 20 U-CFTs relevant to the scenario they just read and prompted participants to indicate how likely they would be to experience such a thought after a similar situation. Both versions of the CFT Likelihood measure (corresponding with both scenarios for Study 1) can be found in Appendix A. The statements in the two versions of this measure were designed to represent a range in terms of reasonability and

a self- vs. other-focus (e.g., self-blame versus other blame for the unpleasant outcome) and were pilot-tested among a group of eight lab members to confirm an acceptable range along the dimensions. Specifically, some items were designed to represent logical, realistic responses to the stressful scenarios in question, while others are responses that might represent a more unhelpful, distorted response to the vignette (e.g., one that focuses on self-blame, even when there was nothing the individual could have done differently, from a realistic perspective). The current study thus examined the prevalence of U-CFT in undergraduates and the frequency of endorsing maladaptive CFT among this sample.

The second measure being piloted in Study 1 was a questionnaire assessing upward counterfactual thinking on a trait level. Specifically, the Upward Counterfactual Thinking Scale (U-CFT-S; Monforton, unpublished; attached in Appendix C) is a 16-item self-report questionnaire designed to assess one's response patterns following disappointing, stressful events. The items in the scale all pertain to one's tendency to engage in "if only..." thinking in response to such events and includes items that represent theoretically adaptive use of U-CFT (e.g., using "If only..." thoughts to learn from your mistakes) and maladaptive use of U-CFT (e.g., "If only..." thoughts focused on personal qualities like being "stupid"). This measure was pilot-tested in a Master's-level psychology course at Ryerson University. Development of the scale in terms of length and content was guided by the feedback of the instructor and students in the course. Preliminary analyses of this measure with a small sample ($n=36$) evidenced encouraging levels of internal consistency ($\alpha=0.90$; unpublished paper), which prompted the decision to pursue validation of the U-CFT-S further with a larger sample.

Hypotheses.

Although this study was largely exploratory, the study proposed some tentative hypotheses based on the related literature. First, it was predicted that U-CFT would be positively related to other cognitive variables of interest that fall into the category of RT (e.g., rumination, worry, PEP, problem-solving), although the strength of these relationships could not be predicted, given the dearth of research on the relationship of various RT constructs in a student sample. The study also determined whether U-CFT has a particularly strong association with self-focused rumination, as measured by Nolen-Hoeksema's Response Style Questionnaire (RSQ; Nolen-Hoeksema, 1991). Self-focused rumination is defined as repeated focus on aspects of the self and one's actions that one wishes could be different. It was predicted that this construct may overlap with the construct of U-CFT, as it is common for upward counterfactual thinking to focus on things that one could have done differently (e.g., "If only I had not embarrassed myself during the speech") or on aspects of the self that are unsatisfactory (e.g., "I wish I weren't such an embarrassment"). It was also hypothesized that the presence of sub-clinical social anxiety symptoms would be positively associated with measures of rumination, negative mood, and a greater tendency to generate U-CFT in response to a stressful scenario, as was demonstrated in past research by Monforton and colleagues (2012). Finally, the present study predicted that social anxiety scores would be positively correlated with the trait U-CFT-S measure as well as total scores on the Counterfactual Likelihood measures and with items from a subscale consisting of maladaptive U-CFT in particular.

Method

Participants.

Participants ($n = 375$; 318 females, 53 males, and 4 who did not answer this question) were undergraduate students enrolled in an Introductory Psychology course at Ryerson University, with a mean age of 20.23 years (ranging from 17 to 49 years of age). Participants were primarily single/unmarried (94.7%) and identified with a variety of ethnic backgrounds (White/Caucasian= 43.5%; East Asian 11.5%; Black/African/Caribbean= 10.4%, South Asian= 9.6%, Other= 6.1%, Mixed Ethnicity= 5.9%, Southeast Asian= 5.3%, North African/Middle Eastern= 4.3%, Latin American= 2.9%, and Aboriginal, 0.3%). All participants first completed the optional pre-screening questionnaire package through SONA, an online study recruitment system. In the pre-screen, students completed the Depression and Anxiety Stress Scales (DASS-21; Lovibond & Lovibond, 1995). Only students who scored 4 or below (8 or below on the final scoring, as scores are doubled using this briefer version of the scale) on the Depression subscale of the DASS-21 had access to the online study. This cut-off was selected because it suggests that the absence of clinical depression, and the study excluded those with prominent depression symptoms, as repetitive thought is a hallmark characteristic of those with depression and there is a high rate of comorbidity between depression and social anxiety.

Recruitment and Compensation.

Introductory Psychology students at Ryerson University who completed the optional pre-screening package and qualified based on their scores on the pre-screen measure had access to an online REB-approved description of the study in SONA and were able to sign up for involvement with the study via SONA if they chose to participate. Participants received 1 course credit toward their Introductory Psychology course for this 1-hour study.

Procedure.

After gaining access to the study through their pre-screen score on the DASS-21 Depression Scale, students were subsequently able to view details about the study on SONA and enroll if interested. Participants were able to complete the study online from any location of their choosing. Following review of the informed consent form, participants completed a series of self-report questionnaires that asked about their thoughts, emotions, behaviours, and psychological constructs of interest (specific measures outlined below). Next, they read a scenario that depicted a stressful situation. They were given three minutes to read and re-read the scenario and were then asked to respond to this scenario with any counterfactual thoughts that come to mind (specific CFT instructions are included in Appendix A). Participants had 5 minutes to complete this task. Next, they were given a list of 20 “If only...” statements that one might have in response to the negative scenario they just read (i.e., the Counterfactual Likelihood measure). They were asked to indicate to what extent they would be likely to have each listed thought following a similar situation. Participants then repeated this process (i.e., reading a scenario, responding with CFT for 5 minutes, and responding to the 20 listed U-CFT statements) with a second scenario. The specific content of the scenarios (i.e., the “Car Crash” scenario and the “Dinner Party” scenario) can be found in Appendix A. Finally, participants were able to review a debriefing form that outlined the aims of the study and provided contact information and resources.

Measures.

Social Phobia Inventory (*SPIN*; Connor, Davidson, Churchill, Sherwood, Foa, & Weisler, 2000). The SPIN is a 17-item, self-report questionnaire that measures multiple facets of social anxiety such as avoidance, embarrassment, physiological manifestations (e.g., blushing),

and fear of being the centre of attention. Strong internal consistency has been found with the SPIN among those with social anxiety ($\alpha = 0.87 - 0.94$) and good internal consistency has been shown for non-socially anxious participants ($\alpha = 0.82 - 0.90$; Connor et al., 2000). Additionally, the SPIN is an effective screening tool for Social Anxiety Disorder (Connor et al., 2000). The SPIN evidenced excellent internal consistency reliability in the current sample ($\alpha = 0.916$).

Depression Anxiety Stress Scales (DASS-21; Lovibond & Lovibond, 1995). The DASS-21 measures one's current levels of symptoms related to depression, anxiety, and general stress. The present study is particularly interested in the 7-item Depression subscale of the DASS-21, which was used as a pre-screening measure for the sample. The full DASS-21 was also included in the main body of the study, along with the rest of the self-report questionnaires. The Depression subscale assesses for current psychological and physiological depression symptoms. The DASS-21 Depression subscale has evidenced excellent internal reliability, with a Cronbach's α value of 0.94 among a clinical participant group and a strong concurrent validity with the BDI (Antony et al., 1998). Each subscale of the DASS-21 evidenced good internal consistency in the present sample (Depression, $\alpha = 0.862$; Anxiety, $\alpha = 0.795$; Stress, $\alpha = 0.837$).

Positive and Negative Affect Scales (PANAS; Watson, Clark, & Tellegen, 1988). The PANAS is designed to measure participants' current level of several emotions and is divided into a Positive Affect subscale (10 items) and a Negative Affect subscale (10 items). Participants rate each emotion, such as "distressed," "excited," and "afraid," along a 5-point response scale from 1 ("very slightly to not at all") to 5 ("extremely"). Watson and colleagues (1988) report very good internal consistency for both of the subscales, with Cronbach's α scores of 0.86-0.90 and 0.84-0.87 for the Positive and Negative Affect scales, respectively. Both subscales of the

PANAS evidenced strong levels of internal consistency in the current sample (Positive Affect- $\alpha = 0.900$; Negative Affect- $\alpha = 0.877$).

Insomnia Severity Index (ISI; Morin, 1993). The Insomnia Severity Index provides a global index of insomnia severity and includes specific domains of insomnia including perceived daytime impairment, distress, and difficulties with sleep onset, maintenance, and early awakenings. With a possible range from 0-28 on the scale, scores from 0-7 indicate the absence of “clinically significant insomnia”, from 8-14 indicate “sub-threshold insomnia”, from 15-21 indicate “clinical insomnia (moderate)”, and from 22-28 represent “clinical insomnia (severe)” (Bastien et al., 2001; Manber et al., 2008). The ISI has been shown to evidence good psychometric properties (Morin et al., 2011) and has been validated as a suitable outcome measure and screening tool for use in research with participants with primary insomnia (PI) (Bastien et al., 2001). A measure of sleep disturbance was included in this study because post-event rumination, symptom-focused rumination, and CFT have all been observed in those with insomnia (e.g., Carney et al., 2010; Schmidt & Van der Linden, 2009). The ISI evidenced good levels of internal consistency in the present sample ($\alpha = 0.807$).

Self-Efficacy For Sleep Scale (SES; Lacks, 1987). The SES is a 9-item visual analogue scale that assesses one's confidence in being able to produce a good night's sleep. The SES has evidenced strong internal consistency reliability ($\alpha = 0.85$) as well as test-retest reliability (e.g., Bluestein et al., 2010; Fichten, 2001). The SES evidenced acceptable levels of internal consistency within the present sample ($\alpha = 0.796$).

Response Style Questionnaire (RSQ; Nolen-Hoeksema, 1991). The RSQ is a 33-item self-report measure that prompts individuals to report how often they generally reflect on negative aspects of their life, such as feeling alone, fatigued, or unmotivated (Nolen-Hoeksema,

1991). The scale has evidenced high internal consistency reliability ($\alpha = 0.85$) as well as substantial discriminant validity from distinct constructs (e.g., Goodeyer et al., 2000). The 22 items that comprise the Self-Focused rumination portion of the RSQ evidenced excellent internal consistency in the present sample ($\alpha = 0.895$).

Penn State Worry Questionnaire (PSWQ; Meyer et al., 1990). The PSWQ is a 16-item self-report questionnaire that assesses for general, trait-like worry tendencies. It has evidenced excellent internal consistency reliability in a variety of populations (e.g., $\alpha = 0.94$ among undergraduates), shows strong test-retest reliability and has correlated significantly with other measures of worry and negative affect-related cognition (Meyer et al., 1990). Although there exists no published literature on the link between worry and CFT, the PSWQ was included in this battery because it has been identified as an important RT construct and has, in the form of anticipatory anxiety, been linked with the maintenance of SAD (e.g., Hinricksen & Clark, 2003; McEvoy & Perini, 2009; Vassilopoulos, 2005; Watkins, 2008). The PSWQ evidenced excellent internal consistency within the current sample ($\alpha = 0.934$).

Post-Event Processing Questionnaire (PEP-Q; Rachman et al., 2000). The PEP-Q is a 13-item measure that assesses the tendency to engage in intrusive and repetitive negative thinking about past anxiety-provoking social events. Each item asks participants to rank their engagement with and consequences of such cognitions (e.g., “Did the thoughts about the event ever interfere with your concentration?”) along a visual analogue scale (0-100). High internal consistency reliability has been found for the PEP-Q ($\alpha = 0.85$; Rachman et al., 2000). Additionally, studies indicate that scores on the PEP-Q are positively related to symptoms of social anxiety and depression (Rachman et al., 2000). The PEP-Q evidenced excellent internal consistency within the present sample ($\alpha = 0.913$).

Upward Counterfactual Thinking Scale (U-CFT-S; Monforton, unpublished). The U-CFT-S is a 16-item self-report questionnaire that asks participants to reflect on how they think about past stressful events. The scale was designed to measure the frequency of both adaptive U-CFT strategies (e.g., learning from one's mistakes) and maladaptive U-CFT strategies (e.g., dwelling on one's perceived inadequacies). The proposed Adaptive U-CFT subscale evidenced excellent internal consistency within the current sample ($\alpha = 0.860$), as did the proposed Maladaptive U-CFT subscale ($\alpha = 0.857$).

The Problem-Solving Inventory (PSI; Heppner & Peterson, 1982). The Problem-Solving Inventory is a 32-item questionnaire designed to gauge individuals' perceptions of their problem-solving abilities. It consists of three subscales, each assessing a distinct domain of problem-solving: 1) approach-avoidance problem-solving style, 2) problem-solving confidence, and 3) personal control (over emotions and behaviours) while problem-solving. The PSI has evidenced excellent internal consistency reliability ($\alpha = .90$; Heppner & Petersen, 1982; Moss, 1983) as well as test-retest reliability (.89; Heppner & Petersen, 1982). The individual subscales have also demonstrated good internal consistency (Problem-Solving Confidence, $\alpha = .85$; Approach-Avoidance Style, $\alpha = .84$; Personal Control, $\alpha = .72$; Heppner & Petersen, 1982) and test-retest reliability, with coefficients ranging from .77 to .88 (Heppner & Petersen, 1982; Ritchey et al., 1984). The subscales of the PSI evidenced fair to excellent levels of internal consistency reliability within the present sample (Confidence, $\alpha = 0.846$; Approach-Avoidance, $\alpha = 0.839$; Control, $\alpha = 0.713$).

Learned Helplessness Scale (LHS; Quinless & Nelson, 1988). The LHS is a 20-item questionnaire that assesses for the construct of learned helplessness (i.e., the perception that one does not have control over positive and negative outcomes in one's life). The measure has

evidenced strong levels of internal consistency reliability (Quinless & Nelson, 1988). The LHS as a whole evidenced excellent internal consistency reliability within the current sample ($\alpha = .918$). The Internal/External subscale evidenced good levels of internal consistency ($\alpha = .804$), the Stable/Unstable subscale evidenced acceptable levels of internal consistency ($\alpha = .795$), and the Global/Specific subscale evidenced good levels of internal consistency ($\alpha = .802$). As the internal consistency reliability was superior for the scale as a whole, only LHS total scores (rather than subscale scores) were used in subsequent analyses.

Levenson Multidimensional Locus of Control Inventory (Levenson IPC Scales; Levenson, 1973). The Levenson IPC Scale is a 24-item, self-report questionnaire that assesses for participants' locus of control orientation along three dimensions: internal control, control of powerful others, and chance. The measure has evidenced adequate internal consistency reliability (e.g., Levenson, 1973; Levenson & Miller, 1976). The subscales of this inventory evidenced adequate internal consistency reliability within the current sample (Internal LOC, $\alpha = 0.787$; Powerful Others LOC, $\alpha = 0.754$; Chance LOC, $\alpha = 0.744$).

Marlow Crowne Social Desirability Scale (M-CSD; Crowne & Marlow, 1960) is a 13-item self-report questionnaire that measures one's intention to present him- or herself in a positive light. It will be used as a measure of discriminant validity for the other questionnaires in the study, as it has been deemed as a valid measure of whether responses to accompanying questionnaires are affected by a desire to present oneself positively (Crowne & Marlow, 1960). The M-CSD evidenced less than adequate levels of internal consistency within the present sample ($\alpha = 0.618$).

Counterfactual Likelihood. The CFT Likelihood measures (which are being piloted in the current study) consist of 20 "If only..." thoughts in relation to the scenario the participant has

just read (i.e., there are 2 CFT Likelihood measures; one for each of the 2 scenarios in the study). Participants are asked to “rate the likelihood that you would have each of the thoughts below as a reaction to the scenario you just read and responded to” and are given 4 response options for each item ranging from “Not at all Likely” to “Definitely”. Both CFT Likelihood measures evidenced excellent internal consistency within the current sample (Non-social car crash scenario, $\alpha = 0.884$; Social dinner party scenario, $\alpha = 0.907$).

Results

Normality, Outliers, and Missing Data

All outcome measures were assessed for normality and outliers. All such variables were free from significant levels of skewness (skewness values >1.96) and no outliers greater than 3 standard deviations from the mean were detected. Regarding missing data, missing responses for participants who had less than 20% of the data matrix missing were replaced with the mean of the relevant scale/subscale. Participants whose missing data was greater than 20% were removed from data set. Fourteen participants were removed due to the amount of missing data. Following data cleaning, the sample included the 375 participants described above in the ‘Participants’ section.

Validating the Upward Counterfactual Thinking Scale (U-CFT-S)

As outlined above, a central aim of the current study was to validate the new measure of trait-level upward counterfactual thinking, the U-CFT-S within this healthy student sample.

Descriptives. The mean score on the complete measure was 44.723 ($SD= 9.24$). The mean score on the proposed Adaptive CFT Subscale (7 items) was 21.744 ($SD= 5.14$) and on the proposed Maladaptive CFT Subscale (9 items) the mean was 22.979 ($SD= 6.860$). A list of the items comprising each proposed subscale is displayed below in Table 1. Mean scores and standard deviations for each individual item on the U-CFT-S are presented below in Table 2.

Total scores and Adaptive CFT subscale scores did not differ significantly between genders. Women evidenced significantly higher scores on the Maladaptive CFT subscale than men ($M(\text{female})=23.349$, $M(\text{male})= 20.887$; $t(369)= -2.919$, $p= 0.015$).

Internal consistency reliability. Cohesion among the items in the total scale and subscale were also examined. The total scale evidenced strong levels of internal consistency ($\alpha=$

0.840). The Adaptive U-CFT subscale evidenced excellent internal consistency within the current sample ($\alpha = 0.860$), as did the Maladaptive U-CFT subscale ($\alpha = 0.857$).

Table 1

<i>Items contained in each U-CFT-S Subscale</i>
<u>Item</u>
Adaptive U-CFT
1. I find “if only...” thoughts make me try harder next time
4. I find “if only...” thoughts help me learn from my mistakes
7. “If only...” thinking makes me want to adopt more positive behaviours
9. “If only...” thoughts help me prepare for similar situations in the future
11. Thinking of how I could have acted differently makes me feel more in control of similar situations
13. “If only...” thoughts give me ideas of how to improve my outcomes in the future
15. I think about how I can change things for next time so that the outcome will be more positive
Maladaptive U-CFT
2. I think “if only I were not such a failure”
3. I blame the outcome on my negative personal qualities
5. I think “if only I were smarter, I would not have made that mistake”
6. “If only...” thinking frustrates me because I focus on aspects of the situation I could not have changed
8. I think “if only people around me had acted differently, the outcome would have been better”
10. I blame myself for the outcome, even if there was nothing I could have done differently
12. I think the same “if only...” thoughts over and over again
14. I think “If only I was not so stupid, things would have turned out better”
16. I think “If only I were different in some way” this negative outcome would not have happened

Principal Components Analysis. Next, the items of the U-CFT-S (as a whole and the proposed Adaptive CFT and Maladaptive CFT subscales) were subjected to a Principal Components Analysis (PCA) to further validate the measure and its underlying factor structure.

Table 2***Mean scores and Standard Deviations for each U-CFT-S Item***

Item	Subscale	Mean Score (Standard Deviation)
1) I find “if only...” thoughts make me try harder next time	A	3.06 (0.997)
2) I think “if only I were not such a failure”	M	1.97 (0.956)
3) I blame the outcome on my negative personal qualities	M	2.26 (1.035)
4) I find “if only...” thoughts help me learn from my mistakes	A	3.00 (1.043)
5) I think “if only I were smarter, I would not have made that mistake”	M	2.57 (1.223)
6) “If only...” thinking frustrates me because I focus on aspects of the situation I could not have changed	M	3.01 (1.147)
7) “If only...” thinking makes me want to adopt more positive behaviours	A	3.05 (1.051)
8) I think “if only people around me had acted differently, the outcome would have been better”	M	2.55 (1.035)
9) “If only...” thoughts help me prepare for similar situations in the future	A	3.06 (0.996)
10) I blame myself for the outcome, even if there was nothing I could have done differently	M	2.72 (1.130)
11) Thinking of how I could have acted differently makes me feel more in control of similar situations	A	3.01 (0.995)
12) I think the same “if only...” thoughts over and over again	M	2.87 (1.161)
13) “If only...” thoughts give me ideas of how to improve my outcomes in the future	A	3.11 (0.960)
14) I think “If only I was not so stupid, things would have turned out better”	M	2.32 (1.170)
15) I think about how I can change things for next time so that the outcome will be more positive	A	3.46 (0.960)
16) I think “If only I were different in some way” this negative outcome would not have happened	M	2.70 (1.153)

Note: A= Adaptive U-CFT Subscale; M = Maladaptive U-CFT Subscale

Is the current dataset appropriate for a principal components analysis? First, Kaiser-Meyer-Olkin (KMO) and Bartlett's Test of Sphericity scores were examined to determine whether conducting a principal components analysis (PCA) was appropriate given the current data set. The KMO value in the current sample was .877, suggesting the presence of sampling adequacy as well as the relative absence of multicollinearity. Further, results of the Bartlett's test were statistically significant ($\chi^2 (120) = 24679.37, p < .001$), suggesting that the correlation matrix of U-CFT-S items is not an identity matrix (i.e., rejecting the null hypothesis that the variables in the correlation matrix are significantly unrelated). Results from both of these statistical tests indicate that the current data is appropriate for a PCA.

Inter-item correlation. Correlations between items were calculated to determine the relationship between questions on the measure as well as to screen for item redundancy. When all 16 items were included in the matrix, inter-item correlations were generally weak to moderate (ranging from -.001 to .742). Lower correlations might be expected when analyzing all items simultaneously, as content from the Adaptive CFT subscale might not be expected to relate strongly to content from the Maladaptive CFT subscale. As such, items from each proposed subscale were correlated separately. Inter-item correlation among the proposed Adaptive CFT subscales were generally moderate (ranging from .359 to .612) and are depicted below in Table 3. Inter-item correlation among the proposed Maladaptive CFT subscales were generally low to moderate (ranging from .176 to .742) and are depicted below in Table 3. Generally, if items are too highly correlated it is likely that they represent the same, or too similar of an idea, and are thus redundant. Typically a cutoff or $r = 0.8$ or higher is used to screen for such redundancy. As such, no items in either subscale were deemed redundant and, thus, subsequent analyses retained all 16 items in the scale.

Table 3***Intercorrelation Among U-CFT-S Items***

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	1															
2	.053	1														
3	0.18	.592	1													
4	.579	.019	-	1												
			.017													
5	.133	.617	.467	.160	1											
6	.114	.176	.162	.025	.232	1										
7	.444	-	.057	.495	.126	.071	1									
		.001														
8	.073	.245	.230	.128	.360	.252	.123	1								
9	.465	-	-	.587	.126	-	.427	.129	1							
		.032	.057			.073										
10	.179	.450	.390	.147	.505	.235	.164	.260	.119	1						
11	.359	.039	.053	.360	.115	.085	.359	.114	.382	.147	1					
12	.189	.401	.353	.165	.485	.220	.134	.330	.229	.462	.154	1				
13	.552	-	-	.612	.112	-	.520	.098	.589	.134	.424	.243	1			
		.049	.040			.001										
14	.018	.588	.489	.055	.742	.191	.055	.359	.007	.448	.049	.513	.047	1		
15	.398	-	-	.423	.020	.124	.436	.114	.425	.108	.404	.146	.594	-	1	
		.022	.011											.016		
16	.142	.489	.519	.088	.587	.184	.131	.303	.046	.450	.123	.509	.122	.603	.182	1

Factor Structure. Given that the above criteria were met, the 16 items of the U-CFT-S were subjected to an exploratory principle components analysis (PCA) using a Direct Oblimin rotation. This type of rotation was implemented because it allows the factors to remain correlated. This is appropriate when considering that there is some overlap between adaptive and maladaptive U-CFT; they are not orthogonal constructs. Using a cutoff of Eigenvalues ≥ 1.00 , this PCA extracted three factors that, combined, accounted for approximately 58.381% of the variance in U-CFT-S scores. Detailed results are located in Table 4.

When using a scree plot criterion, however, only the first and second and largest factors appeared to be viable, in terms of amount of variance accounted for. Additionally, the division of items into each of the three components did not closely mirror the hypothesized two-factor model of U-CFT (i.e., adaptive and maladaptive facets). See Table 5 for a full list of interpretable loadings on these three initial factors.

Table 4

Eigenvalues and Variance Accounted for (PCA with Oblimin Rotation)

Component	Total Eigenvalue	% of Variance	Cumulative %
1	4.814	30.085	30.085
2	3.471	21.692	51.777
3	1.041	6.505	58.381

As such, a second PCA using Direct Oblimin rotation was used, this time forcing two factors (as suggested by the scree plot). This PCA revealed two factors with identical eigenvalues and percentages of variance accounted for as in the above PCA (see Table 5). The correlation between these two factors was .166. In this analysis, items did fall more neatly into these two factors. See Table 6 for a full list of factor loadings. Those items bolded in Table 6 represent interpretable factor loadings. Loadings were defined as interpretable if they were

greater than 0.4 and if such a high loading was only evident on one, as opposed to both components.

Table 5

Factor loadings for Exploratory PCA (Oblimin Rotation)

Item #	Component 1	Component 2	Component 3
1		.731	
2	.826		
3	.745		
4		.807	
5	.836		
6			.907
7		.696	
8			.502
9		.791	
10	.618		
11		.587	
12	.619		
13		.855	
14	.852		
15		.682	
16	.754		

Table 6

Factor loadings for PCA forced 2 Factors (Oblimin Rotation)

Item #	Component 1	Component 2
1	.031	.729
2	.792	-.159
3	.723	-.151
4	.001	.792
5	.833	.150
6	.348	.017
7	.028	.699
8	.477	.102
9	-.044	.767
10	.633	.099
11	.049	.599
12	.661	.166
13	-.027	.846
14	.846	-.106
15	-0.20	.710
16	.768	.035

As depicted in Table 6, Factor 1 (accounting for 30.085% of variance) has 8 interpretable loadings, which correspond to items 2, 3, 5, 8, 10, 12, 14, and 16. Each of these items belongs to the proposed Maladaptive CFT subscale. Factor 2 (accounting for 21.692% of variance) has 7 interpretable loadings, which correspond to items 1, 4, 7, 9, 11, 13, and 15. Each of these items belongs to the proposed Adaptive CFT subscale. Thus, a clear factor structure mimicking the proposed subscale of the U-CFT-S appears to emerge when a forced 2-factor structure is calculated.

One item (item 6- ““If only...” thinking frustrates me because I focus on aspects of the situation I could not have changed ”) did not load significantly onto either factor, using the cutoff of 0.4. Given that it does load more strongly on the relevant thematic factor, and given that the factor loading is .348 (not much below the cut-off of 0.4), this item was retained as part of the Maladaptive CFT subscale for the remainder of this study. Future investigations may consider dropping this item.

Convergent and Discriminant Validity. Correlations between the Adaptive and Maladaptive CFT subscales and other measures of RT were calculated in order to further validate these subscales as relevant constructs. The Adaptive CFT subscale was significantly correlated with the Internal Locus of Control subscale ($r(373) = .301, p < .01$) as well as the PSWQ questionnaire ($r(373) = .135, p < .01$).

The Maladaptive CFT subscale evidenced significant correlations with several measures of RT and psychological distress, including social anxiety symptoms (the SPIN; $r(737) = .451, p < .001$), positive affect (PANAS Positive ; $r(373) = .181, p < .001$), negative affect (PANAS Negative; $r(373) = .438, p < .001$), the presence and severity of insomnia symptoms (ISI; $r(373) = .359, p < .001$), all 3 subscales of the DASS (Depression, $r(373) = .441$; Anxiety, $r(373) = .452$;

Stress, $r(373) = .512, p < .001$), post-event processing (PEP-Q; $r(373) = .486, p < .001$), a belief that powerful others determine outcomes in one's life (Powerful Others LOC; $r(373) = .409, p < .001$), a belief that chance determines outcomes in one's life (Chance LOC; $r(373) = .380, p < .001$), learned helplessness (LHS; $r(373) = -.553, p < .001$; the constructs are positively related, but the wording of items leads to a negative correlation), worry-related cognition (PSWQ; $r(373) = .524, p < .001$), and self-focused rumination (RSQ; $r(373) = .548, p < .001$). The magnitudes of these relationships suggest moderate correlations between the Maladaptive CFT subscale and a variety of RT and distress-related constructs.

The correlations of U-CFT-S subscales with dissimilar measures/constructs were also calculated in an effort to establish discriminant validity. In particular, the relationship between these scales and the Epworth Sleepiness Scale and the Marlow Crowne Social Desirability scale were considered, as neither of the latter two questionnaires have theoretical links to measures of repetitive thinking. While the Adaptive CFT scale did not correlate significantly with either the Epworth ($r(373) = .023, p = .658$) or the MCSD ($r(373) = -.021, p = .861$), the Maladaptive CFT scale did relate significantly to both (with the Epworth, $r(373) = .199, p < .01$; with the MCSD, $r(373) = .190, p < .01$). While these significant correlations are difficult to interpret, the magnitude of these relationships is arguably low enough to establish discriminant validity.

Validating the Counterfactual Likelihood (CL) Scales.

As outlined above, the Counterfactual Likelihood (CL) scales are 20-items questionnaires that were presented to participants following each scenario (i.e., the non-social Car Crash scenario and the social Dinner Party scenario) after they had the opportunity to generate any spontaneous counterfactual thoughts that came to mind in response to the scenario. As both of the above scenarios were designed to represent non-repeatable, uncontrollable scenarios, all U-

CFT generated in response to these vignettes might be conceptualized as maladaptive (e.g., resulting U-CFT might not be linked to future improvement). That said, each CL scale was designed to include statements with a range of maladaptiveness (i.e., some focusing on more practical elements, others focusing on perceived personal flaws). While no specific subscales were intended within these scales, the subsequent analyses determined whether the CL scales represent a unified construct or would be better broken down into thematic subscales.

Descriptives. Within the current sample, the mean score on the Car Crash Scenario CL was 45.643 ($SD= 11.530$) and the mean score on the Dinner Party Scenario CL was 42.941 ($SD= 12.638$). Mean scores and standard deviations for each individual item on both CL measures are presented below in Tables 7 and 8.

Both CFT Likelihood measures differed significantly between genders. Women evidenced significantly higher scores on the Car Crash CL scale than men ($M(\text{female})=46.168$, $M(\text{male})= 42.793$; $t(361)= -1.969$, $p= 0.05$) as well as on the Dinner Party CL scale ($M(\text{female})= 43.946$, $M(\text{male})= 37.377$; $t(364)= -3.548$, $p< .001$).

Principal Components Analysis. A PCA was then conducted to determine whether the CL measures represented cohesive or multi-faced constructs.

Is the current dataset appropriate for a principal components analysis? First, Kaiser-Meyer-Olkin (KMO) and Bartlett's Test of Sphericity scores were examined to determine whether conducting a principal components analysis (PCA) was appropriate given the current data set. The KMO value for the Car Crash CL was .889, and for the Dinner Party CL was .913, suggesting the presence of sampling adequacy as well as the relative absence of multicollinearity in both scales. Further, results of the Bartlett's test were statistically significant for the Car Crash

Table 7***Means and Standard Deviations of the Car Crash CL Measure***

Item	Mean (Standard Deviation)
If only the driver hadn't fled the scene	3.25 (1.012)
If only the mailbox and railings weren't damaged	2.36 (1.059)
If only I weren't such an unlucky person	1.82 (.958)
If only the driver hadn't lost control of the car	2.90 (1.051)
If only my quiet Saturday morning wasn't ruined	2.32 (1.154)
If only such terrible things didn't happen to me	2.03 (1.014)
If only I hadn't have done the renovations already	2.82 (1.129)
If only I didn't feel so startled and panicked	1.87 (.994)
If only the driver had not gotten behind the wheel today	2.32 (1.114)
If only my life weren't filled with so many stressful events	1.80 (.934)
If only I could have made it outside faster to confront the driver	2.56 (1.138)
If only the driver weren't so careless	2.92 (1.048)
If only there weren't so much traffic on my street	1.98 (1.007)
If only there had been a witness to see what had happened	3.03 (.997)
If only the Universe wasn't against me	1.48 (.830)
If only there was a fence in the yard to prevent the driver from reaching the porch	2.13 (1.023)
If only the driver had hit someone else's house instead	2.11 (1.165)
If only I weren't such a magnet for stressful events	1.57 (.860)
If only the driver had swerved to miss the porch	2.40 (1.024)
If only I had chosen to live somewhere else.	1.74 (1.039)

Table 8***Means and Standard Deviations of the Dinner Party CL Measure***

Item	Mean (Standard Deviation)
If only I had inspected my chair more closely before I sat down	2.14 (1.127)
If only I had not gone to the party at all	2.05 (1.167)
If only everyone wasn't staring at me	2.32 (1.104)
If only my friend had thrown the chair out when she was supposed to	3.11 (1.033)
If only I weren't such an embarrassment	1.92 (1.017)
If only I hadn't spilled the lasagna when I fell	2.72 (1.077)
If only all parties didn't turn out so poorly	1.50 (.843)
If only I had sat at a different chair	3.17 (1.041)
If only no one had seen me fall	2.43 (1.143)
If only my friend had cooked a less messy meal	1.88 (1.110)
If only I weren't so heavy	1.84 (1.097)
If only I had been sitting more carefully	1.94 (.996)
If only I weren't such a klutz	2.00 (1.073)
If only my friends had purchased better quality furniture	1.97 (1.048)
If only I weren't so self-conscious	2.05 (1.098)
If only the chair had broken before dinner began	2.38 (1.097)
If only I had reacted faster to prevent the fall	2.40 (1.041)
If only the party had been at someone else's house	1.59 (.930)

If only I had eaten quicker so no food would have been on my plate when I fell	1.75 (.997)
If only I didn't humiliate myself like this all the time	1.73 (.947)

CL (χ^2 (190) = 2812.096, $p < .001$) and for the Dinner Party CL (χ^2 (190) = 2928.633, $p < .001$), suggesting that the correlation matrix of items on both scales were not identity matrices (i.e., rejecting the null hypothesis that the variables in the correlation matrix are significantly unrelated). Results from both of these statistical tests indicate that the current data is appropriate for a PCA.

Internal consistency reliability. Cohesion among the items in both scales were also examined. The Car Crash CL scale evidenced strong levels of internal consistency ($\alpha = 0.884$). The Dinner party CL scale also evidenced excellent internal consistency within the current sample ($\alpha = 0.907$).

Inter-item correlation. Correlations between items were calculated to determine the relationship between questions on the measures as well as to screen for item redundancy. For the Car Crash CL scale, inter-item correlations were generally weak to moderate (ranging from -.014 to .654). For the Dinner Party CL scale, inter-item correlation was generally moderate (ranging from .140 to .689). As outlined above, if items are too highly correlated it is likely that they represent too similar of an idea, and are thus redundant. Typically a cutoff of $r = 0.8$ or higher is used to screen for such redundancy. As such, no items in either scale were deemed redundant and, thus, subsequent analyses retained all items in the scales. Given that some of the correlations were quite weak, however, a factor analysis of each scale was conducted to determine whether separate constructs (and thus, subscales) might be present within the scales.

Factor Structure. Given that the above criteria were met, the 20 items of each CL scale were subjected to an exploratory principle components analysis (PCA) using a Varimax rotation.

Car Crash CL Scale. Using a cutoff of Eigenvalues ≥ 1.00 , this PCA extracted three factors that, combined, accounted for approximately 51.068% of the variance in U-CFT-S scores. Detailed results are located in Table 9.

When using a scree plot criterion, however, only the first and second and largest factors appeared to be viable, in terms of amount of variance accounted for. Additionally, the division of items into each of the three components did not evidence any sort of thematic patterns. See Table 10 for a full list of interpretable loadings on these three initial factors.

Table 9

Eigenvalues and Variance Accounted for- Dinner Party CL (PCA with Varimax Rotation)

Component	Total Eigenvalue	% of Variance	Cumulative %
1	6.469	32.347	32.347
2	2.532	12.659	45.006
3	1.216	6.080	51.068

As such, a second PCA using Varimax rotation was used, this time forcing two factors (as suggested by the scree plot). This PCA revealed two factors with identical eigenvalues and percentages of variance accounted for as in the above PCA (see Table 9). In this analysis, items did fall more neatly into these two factors. See Table 14 for a full list of factor loadings. Those items bolded in Table 11 represent interpretable factor loadings. Loadings were defined as interpretable if they were greater than 0.4 and if such a high loading was only evident on one, as opposed to both components.

Table 10***Factor loadings for Exploratory PCA- Dinner Party CL (Varimax Rotation)***

Item #	Component 1	Component 2	Component 3
1		.774	
2			
3	.729		
4		.629	
5		.466	
6	.808		
7			.656
8	.489		
9			
10	.826		
11		.583	
12		.668	
13			.629
14		.678	
15	.793		
16			.674
17	.414		
18	.846		
19			.573
20	.403		

As depicted in Table 11, Factor 1 (accounting for 32.347% of variance) has 8 interpretable loadings, which correspond to items 2, 5, 7, 9, 14, 16, 17, and 19. Although all items in this scale might be considered maladaptive (in that they are in response to a non-repeatable, uncontrollable situation), the items in this factor appear to take on a particularly unhelpful tone, focusing on aspects of the self (e.g., “If only I weren’t such an unlucky person”, “If only such terrible things didn’t happen to me”) or highly unreasonable statements (e.g., “If only I had chosen somewhere else to live”).

Factor 2 (accounting for 12.659% of variance) has 10 interpretable loadings, which correspond to items 1, 3, 4, 6, 10, 11, 13, 15, 18, and 20. Each of these items appear to focus on more concrete, reasonable “if only...” statements (e.g., “If only the driven hadn’t lost control of

the car”, “If only there had been a witness to see what had happened”). As such, it might be proposed that the Car Crash CL scale might contain two distinct subscales.

Table 11

Factor loadings for PCA forced 2 Factors- Dinner Party CL (Varimax Rotation)

Item #	Component 1	Component 2
1	.072	.620
2	.748	.152
3	.127	.654
4	.340	.556
5	.792	.139
6	.161	.436
7	.512	.240
8	.467	.556
9	.818	.136
10	.194	.591
11	.112	.694
12	.423	.446
13	.039	.636
14	.792	-.055
15	.329	.475
16	.462	.324
17	.833	.037
18	.254	.529
19	.518	.195
20	-.177	.587

Two items (item 8- ““If only the driver had not gotten behind the wheel today” and item 12-“If only there weren’t so much traffic on my street”) loaded significantly onto both factors, using the cutoff of 0.4. Given that the presence of these items did not significantly impact the internal consistency reliability of the scale (total scale alpha= .884; alpha if item 8 removed= .874; alpha if item 12 removed= .877), these two items were retained as part of the Car Crash CL Scale for the remainder of this study. Future investigations may consider removing these items.

Dinner Party CL Scale. Using a cutoff of Eigenvalues ≥ 1.00 , this PCA extracted five factors that, combined, accounted for approximately 61.160% of the variance in Dinner Party CL scores. Detailed results are located in Table 12.

When using a scree plot criterion, however, only the first factor appeared to be viable, in terms of amount of variance accounted for. Additionally, an unrotated component matrix revealed that all 20 items of this scale have a factor loading of 0.4 or higher. Taken together, this suggests that the Dinner Party CL scale consists of one single, cohesive factor.

Table 12

Eigenvalues and Variance Accounted for- Dinner Party CL (PCA with Varimax Rotation)

Component	Total Eigenvalue	% of Variance	Cumulative %
1	7.380	36.900	36.900
2	1.550	7.749	44.646
3	1.196	5.918	50.630
4	1.092	5.458	56.088
5	1.014	5.072	61.160

Table 13

Correlation between CL Scales and Measures of RT and Distress

	Car Crash CL	Dinner Party CL
SPIN	.204**	.383**
PANAS Neg	.243**	.277**
ISI	.217**	.207**
DASS-D	.194**	.220**
DASS-A	.285**	.343**
DASS-S	.277**	.319**
PEP-Q	.282**	.335**
LOC-Others	.282**	.301**
LOC-Chance	.303**	.286**
LHS	-.266**	-.362**
PSWQ	.334**	.369**
RSQ	.269**	.354**

Note: Values reported are Pearson's Correlation Coefficients (r)

*** indicates significance at the .01 level*

Convergent and Discriminant Validity. Correlations between the Car Crash and Dinner Party CL scales and other measures of RT and emotional distress were calculated in order to further validate these scales as relevant constructs. Both CL measures correlated significantly with several (and identical) measures of RT and psychological distress, including SPIN, PANAS Negative, ISI, all 3 subscales of the DASS, PEP-Q, Powerful Others LOC, Chance LOC, LHS, PSWQ, and RSQ. The magnitudes of these relationships suggest low to moderate correlations between the CL scales and a variety of RT and distress-related constructs. For a full listing of correlations, please see Table 13.

The correlations of the CL scales with dissimilar measures/constructs were also calculated in an effort to establish discriminant validity. In particular, the relationship between these scales and the Epworth Sleepiness Scale and the Marlow Crowne Social Desirability scale were considered, as neither of the latter two questionnaires have theoretical links to measures of repetitive thinking. Both CL scales did relate significantly to both (with the Epworth, $r(373) = 1.88$ (Car Crash), 1.46 (Dinner Party), $p < .01$; with the MCSD, $r = .241$ (Car Crash), $.234$ (Dinner Party), $p < .01$). As these low, yet nonetheless significant correlations are difficult to interpret, further investigations may be needed to establish discriminant validity for this scale.

Factor Analysis of Measures of RT. Given the overall validity of the U-CFT-S and CL scales, a factor analysis at the scale level was conducted to determine the relationship between these new measures of CFT and established measures of repetitive thinking and emotional distress.

Is the current dataset appropriate for a principal components analysis? The KMO value for the sample was .883, suggesting the presence of sampling adequacy as well as the relative absence of multicollinearity in both scales. Further, results of the Bartlett's test were

statistically significant for the sample ($\chi^2 (231) = 3481.843, p < .001$) suggesting that the correlation matrix was not an identity matrix. Results from both of these statistical tests indicate that the current data is appropriate for a PCA.

Inter-item correlation. Correlations between measures were calculated to determine the relationship between questionnaires to ensure strong enough associations to warrant a principal component analysis. Within the sample, inter-item correlations were generally low to moderate (ranging from -.003 to .699). Using the cut-off of $r = 0.8$, no questionnaires were deemed redundant and, thus, subsequent analyses retained all scales. Further, lower correlations might be expected in this matrix, as separate factors with distinct thematic content were expected to emerge.

Factor Structure. Given that the above criteria were met, the 22 scales/subscales were subjected to an exploratory principle components analysis (PCA).

Using a cutoff of Eigenvalues ≥ 1.00 , this PCA extracted six factors that, combined, accounted for approximately 66.070% of the variance in U-CFT-S scores. Detailed results are located in Table 14.

Table 14

Eigenvalues and Variance Accounted for (PCA with Oblimin Rotation)

Component	Total Eigenvalue	% of Variance	Cumulative %
1	7.404	33.653	33.653
2	1.927	8.759	42.411
3	1.577	7.170	49.581
4	1.371	6.233	55.814
5	1.218	5.538	61.352
6	1.038	4.718	66.070

When examining these six factors, some interpretable themes arise. For instance, Factor 1 (accounting for 33.653 amount of variance), includes 7 interpretable loadings- the UCFT-S

Maladaptive Subscale, the PANAS Negative Affect subscale, all three subscales of the DASS-21, the PEP-Q scale, and the RSQ (i.e., rumination). While the SPIN does not load onto the factor at the 0.4 cut-off, its loading approaches this value (i.e., .376) and thus, might also be included on this factor. Overall, this first and largest factor appears to represent a cluster of scales that assess for trait-like negative mood (i.e., anxiety, depression, stress, and negative affect) and repetitive thinking (i.e., maladaptive U-CFT, post-event processing, and rumination).

Factor 2 (accounting for 8.759% of variance), includes the U-CFT-S Adaptive subscale, the LOC Internal subscale, the LH scale (negative loading), the Approach/Avoidance subscale of the PSI, and the Confidence subscale of the PSI (negative loading). As such, this factor appears to represent more adaptive forms of cognition, as well as a lack of Learned Helplessness, and a confident, approach-based style to Problem-Solving (negative loadings on the PSI Confidence subscale related to the wording of the questions, rather than a lack of confidence). This factor, then, might be conceptualized as one encapsulating a sense of self-efficacy.

Factor 3 (accounting for 7.170% of variance) includes two scales only, the LOC Powerful Others and LOC Chance subscales. This factor suggests that having a more external LOC orientation (either feeling that luck or those in authority control one's destinies) might represent a unique construct from the self-efficacy (or lack thereof) theme uncovered in Factor 2.

Factor 4 (accounting for 6.233% of variance) includes the PANAS Positive subscale, the PSWQ (i.e., worry), and the Control subscale of the PSI. This factor is more difficult to interpret and does not evidence a cohesive theme.

Factor 5 (accounting for 5.538% of variance) includes the two CL measures. The fact that the CL measures load on a separate factor (rather than in Factor 1 with the other measures of low

mood and RT) suggests that these state measures of CFT might represent a different process than more trait-based measures of mood and cognition.

Finally, Factor 6 (accounting for 4.718% of variance) includes the two sleep-related measures, the ISI (negative loading) and the SES. This factor suggests that difficulties with sleep (or a lack thereof) represent a unique construct, not inherently associated with low mood, RT, or self-efficacy in general.

Although the majority of these factors are interpretable in terms of thematics, using a scree plot criterion, only the first and largest factor appeared to be viable, in terms of amount of variance accounted for. As such, the first factor including measures of trait-level mood and cognition can be seen as the most cohesive and reliable. See Table 15 for a full list of interpretable loadings on these six initial factors.

Given the sufficient sample size, the same PCA was run on the first half of the sample ($n=185$; the first 185 participants to complete the study), after which this solution was tested within the second half of the sample ($n=190$). Results of the initial PCA ($n=185$) revealed a similar factor structure as with the entire sample. Using a Direct Oblimin rotation, the PCA revealed a six-factor structure, accounting for 66.721% of variance. The first factor was the largest and most cohesive factor (accounting for 33.547% of variance) and contained the following interpretable loadings: PANAS Negative (.711), DASS Depression (.782), DASS Anxiety (.766), DASS Stress (.824), U-CFT-S Maladaptive (.374), PEPQ (.617), and RSQ (.531).

Next, the study attempted to replicate this six factor model (with the majority of RT and mood variables on the first, largest factor) with the second half of the sample ($n=190$) using a PCA with Direct Oblimin rotation. Results revealed a near identical 6-factor structure accounting

for 67.338% of variance. The largest and most cohesive factor (accounting for 34.026% of variance) contained the following interpretable loadings: SPIN (.541), PANAS Negative (.795), DASS-D (.724), DASS-A (.684), DASS-S (.676), U-CFT-S Maladaptive (.396), PEP-Q (.678), and RSQ (.546). As such, the only notable difference between the first and second halves of the sample was the interpretable loading of the SPIN on the first and largest factor.

Table 15

Interpretable Factor loadings for Exploratory PCA (Oblimin)

Scale	Component 1	Component 2	Component 3	Component 4	Component 5	Component 6
UCFTS A		.581				
UCFTS M	.439					
CL Car					-.903	
CL Party					-.858	
SPIN	.376					
PANAS P				.811		
PANAS N	.754					
ISI						-.670
DASS D	.796					
DASS A	.732					
DASS S	.807					
PEPQ	.673					
LOC Int		.765				
LOC Oth			-.904			
LOC Cha			-.889			
LHS		-.479				
PSWQ				-.509		
SES						.536
RSQ	.603					
PSI ApAv		.578				
PSI Conf		-.479				
PSI Cont				.541		

For further exploratory purposes, a PCA was conducted forcing two factors, using a Direct Oblimin rotation. This 2-factor solution evidenced an interpretable distinction between measures of negative mood and repetitive thought and measures of positive mood, adaptive cognition, and self-efficacy (i.e., U-CFT-S Adaptive subscale, PANAS Positive, LOC Internal,

and the PSI Approach/Avoid and Confidence subscales). Thus when two factors (one “maladaptive” and one “adaptive”) are forced, the measure fall quite neatly into these two categories. The full loadings on this 2-factor solution are outlined below in Table 16.

Table 16

Factor Loadings forced 2-factor PCA with Oblimin Rotation

Measure	Component 1	Component 2
U-CFT-S Adaptive	.231	.656
U-CFT-S Maladaptive	.797	.012
CL Car Crash	.608	.256
CL Dinner Party	.656	.231
SPIN	.598	-.050
PANAS Positive	-.176	.296
PANAS Negative	.582	-.242
ISI	.531	.005
DASS-D	.602	-.264
DASS-A	.637	-.132
DASS-S	.755	-.003
PEP-Q	.667	.083
LOC Internal	.072	.614
LOC Others	.551	.051
LOC Chance	.532	-.036
PSWQ	.682	.186
SES	-.503	.165
RSQ	.696	.080
PSI Approach/Avoid	-.149	.615
PSI Confident	.501	-.575
PSI Control	-.493	.276
LH	-.621	.321

Relationship between Social Anxiety Symptoms and CFT Generation. As outlined above, an additional aim of the present study was to examine the patterns of counterfactual thinking in a healthy participant group and to determine the relationship between the severity of social anxiety-related symptoms and a tendency to generate U-CFT in response to non-repeatable, uncontrollable social and non-social stressful scenarios.

Descriptives for the SPIN. The mean score on the SPIN, the primary measure of social anxiety symptoms, was 19.995 ($SD= 11.979$), with a range of 0-58 on this scale (the SPIN has a maximum score of 68). Any score of 20 or below on the SPIN represents an absence of notable social anxiety symptoms (Connor et al., 2000), which means that, on average, the current sample can be characterized as non-socially-anxious, and thus in line with the aim of recruiting a generally healthy sample. Given the wide range of scores on the SPIN, however, it is apparent that there are several participants who fall into the mild ($n= 91$), moderate ($n= 52$), severe ($n= 15$), and very severe ($n= 5$) social anxiety ranges, as per SPIN scoring guidelines (Connor et al., 2000), which does suggest that there are some participants in this sample who might fall into the clinically socially anxious range (though diagnoses cannot be made based on the SPIN alone). This also suggests that a restricted range of SPIN scores within this sample should not be a concern.

CFT Generation Index. In order to calculate an appropriate counterfactual thinking-based dependent variable for this study (based on spontaneous CFT generation following the scenarios) an index score was created by subtracting the number of downward counterfactuals from the number of upward counterfactuals that each participant generated (CFT Difference). Thus, higher scores on this index represent a greater number of upward counterfactuals generated in comparison to downward counterfactuals. This type of CFT index has been used in previous studies in the area of counterfactual thinking (e.g., Monforton et al., 2012; Roese, 1994; Sirois et al., 2010) and controls for differences in generativity.

Interrater Reliability. A second researcher rated a selection of these self-generated counterfactual thoughts (CFT generated in response to the Dinner Party scenario, for 50

participants) so that interrater reliability might be calculated. Interrater reliability for the CFT Difference scores in this sample was substantial ($\kappa = .663, p < .001$).

Relationship between SA symptoms and CFT generation. Correlation analyses were conducted between SPIN and CFT Difference scores. Results indicated a significant, positive relationship between SPIN and CFT Difference scores in response to the social Dinner Party scenario ($r(373) = .188, p < .05$), but not in response to the non-social Car Crash scenario ($r(373) = .064, p = .227$).

Correlations between SPIN scores and the new measures of CFT generation were also examined. Interestingly, SPIN scores correlated significantly with the Dinner Party CL scale ($r(373) = .383, p < .001$) as well as with the Car Crash CL scale ($r(373) = .204, p < .001$). Unlike the pattern with spontaneous CFT generation, when participants were asked to rate the likelihood of provided upward counterfactual thoughts, levels of social anxiety significantly predicted greater levels of U-CFT, even when the scenario was not social in nature. Of note, however, the magnitude of the correlation between SPIN and the Dinner Party CL was significantly greater than that of the Car Crash CL ($z = 2.68, p = .004$, one-tailed), which does mirror the pattern that socially-relevant scenarios are more likely to lead to greater U-CFT in those who are more socially anxious. Finally, correlations between SPIN scores and U-CFT-S subscale scores (measures of trait CFT generation) were examined. While there was no significant relationship between SPIN and U-CFT-S Adaptive subscale scores ($r(373) = .054, p = .301$), there was a moderate, positive relationship between SPIN and U-CFT-S Maladaptive subscale scores ($r(373) = .451, p < .05$), suggesting that levels of social anxiety symptoms were also associated with a more general tendency to engage in maladaptive upward CFT (e.g., focusing on personal flaws, blaming others, concentrating on uncontrollable situations).

Discussion

The present study had three central aims: 1) to validate new measures of trait and state counterfactual thinking, 2) to determine the relationship between counterfactual thinking and other measures of repetitive thinking and distress, and 3) to determine the relationship between social anxiety symptoms and counterfactual thinking in response to non-repeatable, uncontrollable scenarios within a generally healthy sample.

Regarding the new measure of trait upward counterfactual thinking, the Upward Counterfactual Thinking Scale (U-CFT-S) evidenced strong levels of internal consistency reliability, convergent validity, and discriminant validity. Factor analyses confirmed the proposed 2-subscale conceptualization of the U-CFT-S. Specifically, the measure appears to tap into a dimension of Adaptive U-CFT (e.g., the use of U-CFT to learn from one's mistakes or plan for future situations) and Maladaptive U-CFT (e.g., the use of U-CFT to ruminate on personal shortcomings or uncontrollable situations). Despite each item on the U-CFT-S pertaining to "if only.." thinking, it was only the Maladaptive U-CFT subscale that correlated significantly with other measures of repetitive thinking (RT) and emotional distress (e.g., symptoms of anxiety, depression, and stress). The Adaptive U-CFT subscale remained unrelated to these measures and instead correlated with measures of positive mood, an internal locus of control, and adaptive problem-solving. This pattern of relationships appears to support the hypothesis that U-CFT in general is neither singularly an adaptive or deleterious process. Instead, delineating the content and context of U-CFT might be essential to determining the effects of "if only..." thinking.

Additionally, the U-CFT-S represents an initial attempt at creating a measure of trait U-CFT (i.e., one's general tendency to engage in upward counterfactual thinking, as opposed to

responding to a specific situation/vignette/manipulation) and is the first of its kind to assess for both adaptive and maladaptive forms of U-CFT. The validation of this scale represents an important step in including such a measure of U-CFT alongside other established measures when examining RT in a research and potentially clinical context.

This study also worked to validate new measures of Counterfactual Likelihood (CL), measures of U-CFT corresponding to the presented vignettes. These questionnaires were designed to provide an alternate measure of CFT response to these non-repeatable, uncontrollable scenarios. As such, participants did not solely generate spontaneous CFT, but were also able to report the likelihood that a variety of listed U-CFT statements would cross their mind if they had experienced such a situation. Both CL measures evidenced strong levels of internal consistency, convergent validity, and divergent validity. Factor analyses revealed a single, coherent structure for the Dinner Party CL and a potential two-factor structure for the Car Crash CL, which should be further delineated in future research. Regardless of factor structure, these CL measures appear to be reliable and valid measures of one's tendency to engage in U-CFT following specific stressful scenarios and might serve as an important adjunct to tasks prompting self-generated CFT. While spontaneous, self-generated CFT should not be abandoned (as it does provide a naturalistic measure of cognition), the CL measures help to control for issues such as generativity and the accessibility of relevant cognitions. That is, just because one does not record a counterfactual thought initially, this does not mean that they might not truly engage in that thought if the situation were to arise. Consequently, providing a list of potential CFT may be an important step because participants may not be able to self-generate the full gamut of potential thoughts without such prompts.

In terms of how the trait and state measures clustered with established measures of RT and psychological distress, an exploratory PCA revealed that the Maladaptive subscale of the new trait-level Upward Counterfactual Thinking Scale (U-CFT-S) loaded significantly onto the largest and most cohesive factor in the analysis. This factor also included other measures of trait-level repetitive thinking such as self-focused rumination (via the RSQ) and post-event processing (via the PEP-Q) as well as trait-level measures of anxiety (via the SPIN, and DASS-A), negative affect and depression (via the PANAS Negative and DASS-D), and stress (DASS-S). This suggests that trait-level maladaptive U-CFT (i.e., a general tendency to engage in “if only...” thinking that is repetitive and focuses on personal flaws and uncontrollable events) overlaps significantly with more established measures of RT as well as symptoms of psychopathology. Interestingly, the Adaptive subscale of the U-CFT-S did not load on this factor. Instead, this subscale loaded on a factor that generally represented a theme of self-efficacy, including in internally-based locus of control, a lack of Learned Helplessness, and an approach-based and confident style of problem-solving. This finding suggests that, when used in adaptive ways (e.g., to learn from one mistakes and for problem-solving purposes), U-CFT can indeed be an adaptive, confidence-boosting form of cognition. This finding also supports the notion that U-CFT cannot be conceptualized as solely adaptive or maladaptive; instead, the content and focus of U-CFT is important in understanding its usefulness.

Unexpectedly, worry (i.e., scores on the PSWQ) loaded onto the Adaptive U-CFT-S scale factor, along with the aforementioned measures of self-efficacy. While this relationship may not be intuitive, the process of worry is often linked to perceptions of planning and preparation, which might explain its overlap with CFT used with such motives (Aspinwall, 2006). Future investigations may further explore this association.

Interestingly, the new measures of Counterfactual Likelihood (state measures of U-CFT) did not load on the same factor as these measures of trait-based cognition and mood. Instead, they loaded on a factor of their own. This finding suggests that in-the-moment, state-based U-CFT may represent a distinct process from one's general tendency to engage in U-CFT day-to-day.

Finally, this study confirmed the hypothesis that levels of social anxiety symptoms would correlate significantly with CFT generation in this sample of students. Specifically, scores on the Social Phobia Inventory (SPIN) were associated with a greater propensity to engage in U-CFT, both self-generated and via the CL measures. In terms of self-generated U-CFT, symptoms of SAD significantly predicted more U-CFT only in response to the socially-based scenario. This finding suggests that a scenario may have to include socially-relevant material to stimulate maladaptive U-CFT in those who are more socially anxious. In terms of the CL measures, however, SPIN scores predicted greater U-CFT in relation to both the social and non-social scenario. This result suggests that when presented with a list of potential CFT, those higher in SA symptoms are more likely to endorse a larger number of U-CFT than those lower in SA symptoms. As such, while scenario content might remain an important factor, it appears that higher levels of social anxiety symptoms might relate to more prolific U-CFT across a variety of stressful situations. Further, SPIN scores were significantly correlated with the Maladaptive subscale of the trait measure of U-CFT (the U-CFT-S), suggesting that higher levels of SA symptoms might relate to an overall thinking pattern characterized by self-blame, a focus on uncontrollable scenarios, and difficulty learning from unfortunate outcomes.

The current study possessed several strengths. First, it contained a substantially large sample size, appropriate for the statistical analyses at hand, that was also ethnically diverse.

Second, the current study represents a novel direction (amidst a general dearth of research) to examine how counterfactual thinking overlaps with other, more established measures of repetitive thinking (e.g., worry, rumination), self-efficacy (e.g., locus of control, learned helplessness) and symptoms of psychopathology (e.g., social anxiety, depression). This work represents an important step in the conceptualization of CFT and its potential role in psychopathology. Indeed, as rumination and post-event processing have been identified as maintaining factor in social anxiety disorder (Hoffman, 2007), so too may maladaptive upward counterfactual thinking. Future research should aim to test this maintenance model directly. Finally, this study piloted novel measures of both trait-level (the Upward Counterfactual Thinking Scale) and state-level (the Counterfactual Likelihood measures) counterfactual thinking. The validation of these measures (including their significant relationships with more established measures of cognition and mood) further supports CFT as a meaningful construct. Further, the validation of these scales (and subscales) provides additional evidence that upward counterfactual thinking should not be conceptualized as entirely adaptive or maladaptive. Instead, the content and context of U-CFT must be considered when assessing for the functionality of such thoughts following a stressful event.

Despite the aforementioned strengths to this study, some limitations should be addressed. First, while participants' ability to complete this study online increased convenience for the participant, it also interfered with the ability to ensure that participants were responding to the tasks and questionnaires in an attentive and timely manner. Second, while there was a significant age range within the sample, participants were all university students, largely in their early 20s. As such, the findings may be generalized to a university population, but perhaps not to a more general community population. Third, while the screening process ensured sub-clinical levels of

depression, and furthermore the SPIN scores in the sample suggested a non-socially anxious sample on average, the present study did not assess for the presence of other pathology, such as panic, eating disorders, personality disorders, or psychosis. As such, the current study cannot fully characterize the potential pathology included in this sample.

Additionally, there were some gender differences on the CL measures (such that females scored significantly higher than males on these questionnaires), which remain difficult to interpret. One possibility is that this finding is attributable to a greater tendency for women to endorse symptoms of low mood and anxiety, which is theoretically linked to the propensity towards maladaptive repetitive thinking (McLean et al., 2011).

Finally, several correlational analyses were conducted within the context of this study, which may have increased the likelihood of Type 1 error. While a Bonferroni correction may have controlled for this error and would have represented a more conservative approach, a spirit of discovery prompted the decision to abstain from such corrections. Indeed, this study was largely exploratory in nature and thus sought to uncover all potential relationships of note. Future studies, particularly those with more directional hypotheses, might benefit from controlling for multiple correlations by adopting a more conservative statistical approach.

The Current Dissertation – Study 2

Study 2 was designed to extend the findings of Study 1 to a clinical sample, and to integrate the findings of the extant literature on (potentially maladaptive) U-CFT and clinical psychopathology. Indeed, Study 2 examined the patterns of upward counterfactual thinking and related emotional and cognitive reactions in a clinically diagnosed Social Anxiety Disorder population. This research aim represented an important and novel research direction, as CFT generation in response to stressful events has never been examined in a clinical SAD sample. Overall, the goals of Study 2 were to clarify:

- 1) For whom U-CFT may be maladaptive (i.e., those with social anxiety versus other groups).
- 2) When may U-CFT be maladaptive (e.g., following an uncontrollable and non-repeatable negative event).
- 3) If there was an interaction between personal characteristics (e.g., the presence of social anxiety) and situational characteristics (e.g., repeatability and controllability) that sets the stage for unhelpful, maladaptive upward counterfactual thinking.

Specifically, this study examined whether those with diagnosed Social Anxiety Disorder generated a greater proportion of U-CFT following uncontrollable, non-repeatable events than do healthy control participants. CFT generation was assessed via a period of self-generated CFT as well as with the CFT Likelihood measure (i.e., responding to a pre-generated list of potential U-CFT). Additionally, this study examined the emotional consequences (mood, guilt, regret, and perceived control) of U-CFT in those with SAD versus a non-clinical group. Further, the current study determined whether U-CFT affects perceptions of problem-solving and whether this relationship varies between participant groups. Thus, the functionality of U-CFT generation was

gauged not only by its relation to uncontrollable, non-repeatable events, but also by its association with subsequent changes in mood, regret, guilt, and perceptions of problem-solving ability and preparedness for the future.

Finally, Study 2 furthered the current research trajectory by administering a brief intervention aimed at reducing the likelihood and negative emotional consequences of maladaptive upward counterfactual thoughts. Indeed, the implication of identifying potentially unhelpful and upsetting U-CFT patterns (e.g., who engages in such thinking and when) is that if such cognitions are identified as problematic, therapists may work to reduce and restructure these thoughts using cognitive-behavioural (CBT) techniques such as cognitive restructuring. A growing body of literature suggests that brief, CBT-based treatments implementing text-, web-based, and video interventions (with minimal therapist contact) have been efficacious at reducing anxiety symptoms among various clinical and sub-clinical groups (e.g., Abramowitz et al., 2009; Carlbring et al., 2006; Dixon et al., 2011; Furmark et al., 2009; Hadjistavropoulos et al., 2014; Mall et al., 2011; Muroff et al., 2012). For instance, Dixon and colleagues (2009) demonstrated that a CBT-based transdiagnostic bibliotherapy approach (i.e., 1-month access to a self-help book aimed at reducing anxiety among those presenting with various anxiety disorders (e.g., phobias, worry, social anxiety)) was effective at significantly reducing avoidance of phobic stimuli and improving coping ability among a non-clinically anxious, undergraduate population, with very minimal therapist contact (as compared with baseline and with a control group). Regarding social anxiety specifically, Calbring and colleagues (2006) evaluated the efficacy of a 9-week internet-based treatment aimed at reducing social anxiety- and overall functioning-related symptoms in participants diagnosed with SAD. The treatment protocol was based on CBT principles and included online readings, quizzes, essay responses, and message board

participation. Treatment was also supplemented with brief weekly contact with a therapist via email. Results indicated that those who received the treatment evidenced significant decreases in SAD-specific symptoms as well as in more general anxiety and depression symptoms; additionally, significant increases in quality of life occurred. These treatment gains were maintained or even further magnified at a 6 month follow-up period.

Further, Furmark and colleagues (2009) compared the efficacy of a purely bibliotherapy, CBT-based self-help program with an internet-based CBT self-help treatment program that involved therapist involvement via online discussion among SAD-diagnosed participants. Results indicated that both treatment modalities were significantly more effective at reducing social anxiety symptoms (as well as depression and more general anxiety symptoms) and increasing quality of life than was a control group, with a slight advantage to the more interactive, web-based intervention. These results were observed both immediately following treatment and at a 1-year follow-up. Furmark and colleagues (2009) concluded that bibliotherapy is a viable and effective form of treatment for those diagnosed with SAD. Similar results were found by Amramowitz and colleagues (2009) who evaluated the efficacy of a self-directed, self-help, workbook-based treatment with minimal therapist contact for those with diagnosed SAD. Results indicated that those in the treatment group (as compared with those in a waitlist condition) evidenced larger and significant reductions (small to moderate effect sizes) in SAD-specific, general anxiety, and depression symptoms, as well as overall clinical severity, following the 8-week treatment period and at a 3-month follow-up assessment.

Recent research by Mall and colleagues (2011) has found similar support for a DVD-based self-help protocol used for treating those with high levels of social anxiety symptoms. The cognitive therapy-based protocol, which consisted of a series of 8 DVD videos, was led by a

female “moderator” who provided instruction on how to conceptualize SAD, recognize feared situations and safety behaviours, plan and conduct homework assignments (e.g., exposure exercises), and interpret the outcomes of these behavioural experiments. The treatment also included videos of hypothetical therapy scenarios (so that participants could see the treatment in action) and weekly email feedback from a therapist regarding the outcomes of homework. Results indicated that the treatment group evidenced significant decreases on a measure of social anxiety symptoms at post-treatment (with large effect sizes), while the control group evidenced a slight worsening of symptoms, with small to moderate, negative effect sizes. Overall, the authors conclude that a DVD-based, self-help program with minimal therapist contact is a potentially promising treatment option for individuals presenting with notable but non-clinical levels of social anxiety. Taken together, the studies summarized above suggest that text- and audio-visual-based treatments with only minor therapist involvement may be an efficacious form of therapy for those with both sub-clinical social anxiety and SAD.

To date, no literature has attempted to apply a cognitive-based intervention for U-CFT in particular. As such, the current study represents an important and novel research direction. Although the intervention included in the study was relatively brief (and the assessment of its efficacy based on immediate, short-term results; methodology outlined below), it represents a trajectory that stems from the literature reviewed above on brief, non-therapist-based treatments and made an initial attempt to demonstrate that maladaptive U-CFT in particular can be targeted and altered using brief, non-therapist-administered CBT techniques.

Participants. The current study compared those with Social Anxiety Disorder to healthy control participants. Thus, this study included two main participant groups (i.e., SAD and healthy controls) to determine whether the upward counterfactual thinking patterns and related

cognitions and emotions of those with SAD differ from those of individuals without any clinical disorders. Centrally, the SAD and Healthy Control (HC) groups were compared across the following measures of interest: U-CFT generation, guilt, regret, self-blame, perceptions of control, and problem-solving.

Hypotheses. Given the findings in the literature presented above, this study posited the following:

1. Those in the SA group will generate a greater proportion of U-CFT (as compared with D-CFT) in general than those in the Control group. That is, relative to healthy controls, the Social Anxiety group will possess a greater tendency to generate U-CFT following an upsetting situation.
2. SA participants will generate more U-CFT in response to socially-based scenarios than to a non-socially based scenario. In other words, this study will examine whether situations containing social anxiety-relevant content (i.e., here, scrutiny from others) lead to increased U-CFT generation in SA participants.
3. The SA group will generate a greater proportion of U-CFT in response to a non-repeatable, uncontrollable scenario than the control group.

Next, this study determined the relationship between the proportion of generated U-CFT and the experience of post-CFT regret, guilt, and self-blame, and whether this relationship varies between the participant groups. Specifically, does the clinical group report higher levels of regret, guilt, and self-blame than does the Control group? Further, might emotional experiences (e.g., reported positive and negative mood, regret, guilt, self-blame) mediate the relationship between participant group and CFT responses to a negative scenario? For instance, is it social anxiety in particular that may lead to an increased propensity to generate U-CFT, or may this be

better accounted for by elevated levels of negative mood and guilt after a negative situation, for example?

Additionally, the relationships between proportion of U-CFT generated (as compared with D-CFT) and affective and cognitive variables including regret, mood, and problem solving were examined. For example, the study queried: does a higher proportion of U-CFT in response to a distressing scenario relate to higher levels of subsequent regret, guilt, self-blame, negative mood, and lower levels of positive mood? Further, does increased U-CFT relate to changes in perceptions of problem-solving efficacy and ability? Does the presence of a clinical disorder (i.e., SAD) alter this relationship between U-CFT and problem solving?

Although the hypotheses regarding the intervention component were largely tentative (as this is the first study to implement CBT treatment techniques to U-CFT), it was predicted that participants randomly assigned to the treatment condition (as compared to a control condition) will evidence a lesser tendency to generate U-CFT (lower U-CFT Difference scores) in response to a subsequent uncontrollable, non-repeatable negative scenario.

Method

Screening Measures

Structured Clinical Interview for the Diagnostic and Statistical Manual of Mental Disorders Version IV-TR (DSM-IV-TR), Research Version (SCID-I/P; First, et al., 2002).

The SCID is a semi-structured interview used to assess a variety of Axis I psychological disorders (e.g., mood disorders, anxiety disorders, psychosis, substance use disorders), as per the DSM-IV-TR criteria. The SCID-I/P has been well-established as a reliable, valid, and easily administered measure of the categories of psychopathology outlined in the DSM-IV-TR (First et al., 2002). Specifically, the Social Anxiety Disorder section of the SCID has been shown to produce reliable and accurate diagnoses of SAD (e.g., Aziz & Kenford, 2004; Lyneham and Rapee, 2005). Further, Lobberstael et al. (2010) found excellent levels of interrater reliability for Social Anxiety Disorder in particular ($\kappa = 0.83$).

Participants.

The Social Anxiety (SA) group ($n = 33$) consisted of those who met full DSM-IV criteria for Social Anxiety Disorder. This participant group was primarily female (78.8%) and single/unmarried (84.8%). The ethnicities included Caucasian (45.5%), South Asian (15.2%), and East Asian (15.2%). Participants had a mean age of 27.48 years ($SD = 12.841$; range of 17-61 years). Participants in this group were screened over the telephone and/or in-person using the SCID (First et al., 1997) to determine the presence or absence of SAD and comorbid disorders. Those who qualified based on a diagnosis of SAD were permitted if they did meet criteria for other comorbid clinical conditions; however, rule-outs include a diagnosis of bipolar disorder, current suicidality, or psychosis.

The healthy control (HC) group (n=32) consisted of adults those who did not meet full criteria for any clinical conditions. This participant group was primarily female (93.8%) and single/unmarried (81.3%). Ethnicities included Caucasian (40.6%), East Asian (15.6%), South Asian (12.5%), and Arabic/Middle Eastern (12.5%). Participants had a mean age of 21.78 years (SD= 6.978; range of 17-46 years). As with the other groups, they were screened in person and/or over the telephone using the SCID to confirm the lack of clinical diagnoses.

Recruitment and Compensation. Some participants were recruited via the Ryerson University SONA system for managing psychological studies. They were able to view the information about the study online on the SONA website and to contact the researchers to set up an appointment for screening. All participants recruited via this method took part in an in-person screening process, as the SONA administrators do not allow telephone screening for SONA participants. Ryerson University students who participated via SONA received partial course credit for their involvement. Participants who completed Study 1 via SONA were not allowed to complete Study 2, due to the repetition of methodology (e.g., repetition of specific scenarios used) and some hypotheses (which would have been elaborated on in the Debriefing form from Study 1).

Other participants were recruited from the downtown Toronto community. They were informed about the study via flyers posted around the community, as well as via advertisements posted on the internet (i.e., Kijiji and Craigslist). Participants who viewed these advertisements were encouraged to email or telephone the researchers to learn more about the study and to schedule a telephone screen if they remain interested. Participants recruited from the community were entered into a draw to win \$50 cash for their involvement with the telephone screen and an additional \$10 if they qualified for and completed the study.

Measures

Participants completed the Social Phobia Inventory (*SPIN*; Connor, Davidson, Churchill, Sherwood, Foa, & Weisler, 2000; for Study 2, $\alpha = .950$), the Positive and Negative Affect Schedule (*PANAS*; Watson, Clark, & Tellegen, 1988; for Study 2, Positive subscale $\alpha = .860$, Negative Subscale $\alpha = .907$), the Post-Event Processing Questionnaire (*PEP-Q*; Rachman et al., 2000; for Study 2, $\alpha = .913$), the Insomnia Severity Index (*ISI*; Morin, 1993; for Study 2, $\alpha = .823$), the Problem-Solving Inventory (*PSI*; Heppner & Peterson, 1982; for Study 2, $\alpha = .520$), the Upward Counterfactual Thinking Scale (*U-CFT-S*; Monforton, unpublished; for Study 2, $\alpha = .872$), and the CFT Likelihood measures (Car Crash CL, $\alpha = .909$; Dinner Party CL, $\alpha = .931$; Presentation CL, $\alpha = .953$), all of which are outlined above in the Methods section of Study 1. In addition, participants completed the following measures:

Single Item Measures of Personality (*SIMP*; Woods & Hampson, 2005). The SIMP is a five-item, analogue scale questionnaire that measures each of the “Big Five” personality dimensions (i.e., Extraversion, Neuroticism, Openness, Agreeableness, and Conscientiousness). For each dimension, brief descriptions are provided at either end of the scale. For example, the descriptions on either end of the Extraversion scale are as follows: “Someone who is talkative, outgoing, is comfortable around people, but could be noisy and attention seeking” and “someone who is a reserved, private person, doesn’t like to draw attention to themselves and can be shy around strangers.” The SIMP has evidenced acceptable levels of convergent validity with longer and more established Big-Five personality measures ($r = 0.61$; Woods & Hampson, 2005). Correlations among the Big-5 dimensions within the present sample are as follows: Extraversion and Agreeableness ($r(63) = 0.063$, $p = .616$), Extraversion and Neuroticism ($r(63) = -0.085$, $p = .500$), Extraversion and Conscientiousness ($r(63) = -.162$, $p = .182$), Extraversion and Openness

($r(63) = -.292, p = .018$), Agreeableness and Neuroticism ($r(63) = .160, p = .204$), Agreeableness and Conscientiousness ($r(63) = .059, p = .646$), Agreeableness and Openness ($r(63) = -.041, p = .747$), Neuroticism and Conscientiousness ($r(63) = .328, p = .008$), Neuroticism and Openness ($r(63) = .008, p = .952$), Conscientiousness and Openness ($r(63) = -.125, p = .324$).

Regret. Regret was assessed following the reading of each scenario, as well as after each counterfactual generation task. Participants were asked “If a situation like the one you just read were to actually happen to you in real life, how much regret would you feel afterwards?” Participants answered this question via a 5-point response scale ranging from “No Regret” to “Much Regret”.

Guilt. Guilt was measured after the reading of each scenario and after each CFT generation task. Guilt was assessed via the question “If a situation like the one you just read were to actually happen to you in real life, how much guilt would you feel afterwards?” Participants were prompted to respond along a 5-point scale that ranged from “No Guilt” to “Much Guilt”.

Self-Blame. Self-blame was measured along with regret and guilt post-scenario and post-CFT generation. Participants were asked “If a situation like the one you just read were to actually happen to you in real life, how much would you blame yourself for the negative outcome?” Participants answered this item using a 5-point scale ranging from “Not at all” to “Very Much”.

Control. Participants’ sense of control over the negative outcomes in the scenario was also measured at the same time as regret, guilt, and self-blame. Perceived control was gauged with the question “Based on the details of the scenario you just read, how much control do you feel you had over the negative outcome?” and was recorded along a 5-point scale ranging from “Not at all” to “Very Much”.

Engagement with the Scenario. Participants were also asked questions to assess how

easily they were able to engage with and relate to the scenario. This was measured following the initial reading of each scenario. Specifically, they were asked “How easy was it to imagine yourself in the scenario you just read? That is, was it easy or difficult to pretend that this situation was happening to you?” Participants answered this question along a 5-point scale ranging from “Very Difficult” to “Very Easy”. Those participants who endorsed a “Very Difficult” or “Somewhat Difficult” response were prompted to reflect on why engagement with the scenario did not come easily. They were presented with 5 pre-set options (e.g., “I would not expect a situation like this to ever happen to me”) as well as an “Other” option, which gave them space to briefly explain any other reasons why engagement with the scenario was difficult. Relatedly, participants were asked if they have ever experienced a situation similar to the one they just read in the scenario (with 3 response possibilities: “Yes”, “No”, “Something similar but not identical”) and, if so, how recently they experienced it (ranging from “Within the past week” to “Five years or longer ago”). Finally, those who had experienced a similar event were asked “If something identical or similar to the scenario you just read actually happened to you in real life, how much of an impact (in terms of stress, for example) did this event have on you?” Participants were prompted to answer this question along a 5-point scale ranging from “No impact” to “Great Impact.”

Future intentions. Following each counterfactual generation task, participants were asked to reflect on their intentions to behave differently if a similar situation were to happen again. Specifically, they were asked “Based on the details of the scenario you read, how much would you intend to behave differently the next time something similar happened?” Participants were given 4 response options, ranging from “I would behave in the exact same way as I did in the scenario” to “I would behave totally differently than I did in the scenario”. These measures of

mood, control, engagement, and intentions can be found in Appendix D.

Demographics. Participants completed a brief questionnaire assessing for individual characteristics such as age, gender, and ethnicity.

Procedure

When participants arrived at the lab to complete the study, they first were provided with an informed consent sheet that outlined the purpose, procedure, risks, and benefits of the study. Participants then had an opportunity to review the informed consent verbally with the experimenter.

Next, the primary investigator of the study completed the SCID interview with participants. This semi-structured interview (outlined in more detail above) queried the presence of a variety of psychological symptoms related to mood and anxiety. This interview took approximately 15-45 minutes in length, depending on the number of symptoms endorsed by the participants.

Next, participants completed a series of questionnaires that assessed their anxiety, mood, sleep habits, problem-solving, and other individual difference variables (described in Measures, above). Participants filled out these questionnaires either on paper or, in the majority of instances, on the computer using software designed for administering such measures (i.e., Qualtrics). Paper versions of the questionnaires were only used when issues with the Qualtrics program interfered with completing the measures in a timely manner.

Following this, participants received a scenario and were asked to read and re-read the scenario, vividly imagining that the situation was happening to them. There were three scenarios, and each participant read all three, but the order in which the scenarios were read varied (i.e., were counterbalanced across participants). Two of the scenarios represented a social situation,

while one presented a non-social context. Further, all three scenarios depicted an uncontrollable, non-repeatable situation (i.e., a Social, Non-repeatable, Uncontrollable scenario for scenario A (which focused on a presentation situation); a Social, Non-Repeatable, Uncontrollable scenario for scenario B (which focused on an unpredictable mishap at a dinner party); and a Non-Social, Non-Repeatable, Uncontrollable scenario for scenario C (which focused on someone observing damage to their property via a car crash). The exact content of these scenarios can be found in Appendix A. Participants were given 3 minutes to complete this task.

Next, participants completed a brief set of measures, assessing for mood (via the PANAS), guilt, regret, self-blame and control. They were also asked to reflect on how much they were able to engage with the scenario and how vividly they were able to picture the situation happening to them. Further, they were prompted to report whether they have ever experienced a situation similar to the one presented in the scenario they just read. The specific measures designed to assess the above constructs (i.e., guilt, regret, self-blame, control, engagement with the scenario, and history with scenario-related events) are outlined above in the Measures section. Following this, they had an opportunity to re-read the scenario one more time in order to refresh their memory about the content.

The next phase involved counterfactual thought generation. Participants were given a worksheet that prompted them to generate any “if only...” or “at least...” thoughts that come to mind” when reflecting on the scenario they just read. Full instructions are adapted from a previous CFT study by Markman and Miller (2006), and can be found in Appendix C. Participants were given a minimum of 3 minutes and a maximum of 5 minutes to complete this generation task.

Following the CFT generation, participants once again completed measures of mood, guilt, regret, control, and problem-solving, in order to assess any changes in these measures as a result of considering and recording counterfactual thoughts. Subsequently, participants were asked to reflect on whether they would have the intentions to act differently in the future, if a situation similar to the one presented in the scenario were to happen again.

Finally, participants completed a measure of Counterfactual Likelihood (also used in Study 1), in which they were asked to rate the likelihood that they would have each of 20 pre-written upward counterfactual thoughts in reaction to the scenario they have just read.

This identical process (i.e., reading the scenario, completing a brief set of questionnaires, re-reading the scenario, generating counterfactual thoughts, and completing a second set of brief questionnaires) was repeated two more times, such that each participant was presented with all three possible scenarios by the end of the study session. Two of the scenarios were given post-questionnaire package, pre-intervention, while the third was presented after the intervention/control condition phase. As mentioned above, the order of the scenario presentation was counterbalanced across participants, but with the non-social scenario always occurring first (as to center the social scenarios around the video intervention). Thus, there were 2 possible presentation orders (i.e., 1, 2, 3; 1, 3, 2). Further, because there is a third scenario used in Study 2 that was not included in Study 1, a third CFT Likelihood measure was created to correspond with the new third scenario (the “Presentation” scenario). The new CFT Likelihood measure is included in Appendix A and the “Presentation” scenario is included in Appendix C.

Next, participants were randomly assigned to either a brief intervention condition or a control condition. The intervention consisted of a 10-minute video depicting a therapist using CBT techniques to challenge a potentially maladaptive upward counterfactual thought (e.g., “If

only I didn't embarrass myself in front of everybody"). This methodology was adapted from the research of Mall et al. (2011), who used videos of mock therapy sessions in the context of a DVD self-help treatment protocol for SAD. The video in the current study demonstrated the use of a thought record to challenge the accuracy and adaptiveness of the upward CFT in question. The points of discussion covered the essential aspects of a thought record (i.e., identifying the situation and related emotions, listing automatic thoughts and identifying the "hot thought" (the U-CFT in question), gathering evidence for and against the "hot thought") and concluded with the patient in the video stating that their original counterfactual thought may not be 100% true and developing a new, more balanced thought (e.g., "Although that event didn't go as planned, I actually did not embarrass myself and others were quite kind to me afterwards"). The video also addressed how generating U-CFT in response to uncontrollable/non-repeatable events and U-CFT focused on stable aspects of the self may represent unhelpful cognitive strategies. The video was recorded by the primary investigator of this study, and the therapist and patient in the video were acted by volunteers from the primary investigator's lab, both of whom were graduate level psychology students who had experience conducting a Thought Record exercise.

The control condition involved a video of similar length, also depicting a mock therapy session scenario. The scene depicted a client describing a past negative social scenario to their therapist and the therapist offering support around the client's distress about this event. This clip, however, did not feature any CBT intervention techniques and did not speak about how U-CFT after some situations may be a maladaptive process. Transcripts of both videos can be found in Appendix E.

Subsequently, participants were presented with a third and final scenario, representing another non-repeatable, uncontrollable social situation. The methodology related to this final

scenario was identical to that of the previous two scenarios (i.e., read the scenario, respond to brief set of questionnaires (e.g., mood, guilt, regret, self-blame, problem solving, engagement with the scenario), re-read the scenario, respond with self-generated CFT, respond to a second set of questionnaires, and fill out the corresponding CFT Likelihood measure).

Finally, participants reviewed a Debriefing form and had the opportunity to discuss any questions or concerns with the researcher.

Results

Normality, outliers, and missing data.

All outcome measures were assessed for normality and outliers. Analyses revealed that 2 variables in the data set (Pre-CFT Blame for the Car Crash scenario and Pre-CFT Control for the Car Crash scenario, both within the HC group) were significantly positively skewed (skewness values >1.96). These variables were transformed using an inverse transformation (e.g., negative reciprocal; Osborne, 2002).

Outliers of greater than 3 standard deviations from the mean were detected on mood, anxiety, and counterfactual thinking. One participant with such outliers was removed, as further investigation revealed they did not qualify for either participant group, based on the selection criteria. Three participants with such outliers were retained, as their responses appeared to be genuine responses to the measures at hand, rather than suggesting they were not appropriate for the clinical group or that there was a measurement error.

Regarding missing data, responses for participants missing less than 20% of the data matrix were replaced with the mean of the relevant scale/subscale. Participants whose missing data was greater than 20% were removed from data set. Four participants were removed due to the amount of missing data.

Following this data cleaning, the groups were finalized as the SAD group ($n=33$) and the HC Group ($n=32$), as reported in the 'Participants' section above.

Do the participant groups differ significantly on the measures of mood, anxiety, and repetitive thinking?

The two groups were first compared across several outcome measures of mood, anxiety, and cognition. These comparisons were conducted to provide validation that the SAD-diagnosed

clinical group did indeed represent a generally more distressed, symptomatic group than did the healthy control group.

Table 17

Means and Standard Deviations on outcome measures by Participant Group

Measure	SAD Group	HC Group
SPIN	41.48 (8.322)	13.25 (8.744)
PANAS Positive	24.30 (7.174)	25.72 (7.480)
PANAS Negative	17.85 (7.174)	12.16 (7.480)
PSI Confident	30.94 (4.769)	30.00 (4.772)
PSI Approach/Avoid	52.33 (4.648)	53.59 (4.825)
PSI Control	13.91 (3.736)	18.34 (4.903)
ISI	9.64 (6.417)	9.22 (4.811)
DASS-D	14.36 (9.688)	4.81 (4.540)
DASS-A	11.88 (9.192)	4.69 (4.504)
DASS-S	18.00 (8.170)	9.44 (6.648)
U-CFT-S Adaptive	23.061 (3.90)	22.125 (5.034)
U-CFT-S Maladaptive	30.364 (6.113)	19.313 (5.97)
PSWQ	64.152 (8.64)	50.00 (12.776)
PEP-Q	724.242 (194.058)	386.844 (281.017)

Results indicate that the SAD group scored significantly higher on measures of social anxiety ($t(63)= 13.338, p<.01, d= 3.301$), negative mood ($t(42.960)= 4.096, p<.01, d= .776$), symptoms of depression ($t(45.712)= 5.063, p< .01, d=1.262$), anxiety ($t(46.845)= 3.985, p< .01, d= .949$), and stress ($t(63)= 4.626, p< .01, d= 1.149$), trait-level maladaptive CFT ($t(63)= 7.362,$

$p < .01$, $d = 1.829$), post-event processing ($t(54.992) = 5.647$, $p < .01$, $d = 1.397$), and worry ($t(63) = 5.246$, $p < .01$, $d = 1.298$) than did those in those in the healthy control group. A full list of means and standard deviations by group for these variables is presented below in Table 16.

Of note, it was initially planned to calculate significant differences between participant groups via MANOVA analyses. These analyses were deemed inappropriate, however, as Box's Test was significant ($F(21, 7417.327) = 1.978$, $p = .05$), suggesting a lack of equality of variance. As such, the remainder of group comparisons throughout Study 2 were calculated via independent samples t -tests.

Do the clinical groups differ significantly on the measures of counterfactual thinking? As with Study #1, a CFT Difference score was created (Upward minus Downward CFTs generated in response to the scenarios) to form an index score based dependent variable, controlling for generativity in responding. As with Study 1, interrater reliability was calculated via a second researcher who rated a portion of the self-generated CFT statements (generated CFT in response to the Car Crash scenario, for 30 participants, 15 from each clinical group) as either “upward” or “downward” CFT. Interrater reliability was found to be substantial within this sample ($\kappa = .723$, $p < .001$).

Results of independent samples t -tests indicated that those in the SAD group had significantly higher CFT Difference scores (indicating a greater propensity towards U-CFT) in response to the social scenarios (Dinner Party Scenario, $t(63) = 2.410$, $p = .019$, $d = .596$; Presentation Scenario, $t(63) = 2.886$, $p = .05$, $d = .718$), but not in response to the non-social Car Crash scenario ($t(63) = 1.259$, $p = .213$, $d = .312$). Full means of CFT Difference scores by group are included below in Table 17.

Table 18***Means and Standard Deviation of CFT Difference Scores by Group***

	Car Crash Scenario	Dinner Party Scenario	Presentation Scenario
SAD Group	.09 (2.638)	2.24 (2.795)	1.70 (3.340)
HC Group	-.75 (2.747)	.44 (3.232)	-.50 (2.759)

Note: CFT Difference Scores = Number U-CFT minus Number D-CFT

Do those in the Social Anxiety Group generate a greater amount of U-CFT in response to the social scenarios than to the non-social scenarios? It was also examined whether those within the SAD group generated a significantly greater relative amount of U-CFT only in response to the social scenarios, as compared with the non-social scenario. Results indicate that those with SAD did indeed generate a significantly larger relative amount (using the CFT Difference scores) in response to the two socially-based scenarios (Dinner Party scenario, $t(32)= 4.608, p < .01, d= 1.629$; Presentation Scenario, $t(32)= 2.919, p= .006, d= 1.032$) than to the non-social scenarios. As mentioned above, the socially-based vignettes appeared to lead to greater U-CFT generation in both participant groups, however, this tendency was not statistically significant among those in the HC group (Dinner Party scenario, $t(31)= .766, p= .450, d= .275$; Presentation Scenario, $t(31)= -1.025, p= .313, d= -.368$).

Do the clinical groups differ significantly on measures of CFT Likelihood? In addition to comparing the groups on measures of spontaneous CFT generation, differences between the SAD and HC groups in terms of CFT Likelihood measures (i.e., their reported likelihood of engaging in a list of provided U-CFT) were also examined. Results indicated that those in the SAD group scored significantly higher on all three CFT Likelihood measures (Car Crash scenario, $t(50)=2.249, p= .029, d= .623$; Dinner Party scenario, $t(58.653)= 4.078, p < .01$,

$d = 1.045$; Presentation scenario, $t(55) 5.737 =$, $p < .01$, $d = 1.516$) than did those in the HC group. Means between the groups are listed below in table 18.

Table 19

Means and Standard Deviations on CL Measures by Participant Group

	Car Crash CL	Dinner Party CL	Presentation CL
SAD Group	47.16 (12.877)	51.207 (12.579)	58.793 (11.085)
HC Group	39.407 (11.985)	37.906 (12.875)	39.439 (14.253)

Do the clinical groups differ significantly on measures of pre-CFT mood, regret, guilt, etc? Next, it was determined whether the participant groups differed significantly on measures of mood after reading the scenarios (i.e., before prompted to generate CFT).

In response to the Dinner Party scenario, those in the SAD group evidenced significantly lower mood ($t(63) = -2.133$, $p = .037$, $d = -.530$) and significantly higher levels of regret ($t(63) = 2.962$, $p = .004$, $d = .735$), guilt ($t(62) = 2.224$, $p = .03$, $d = .556$), and self-blame ($t(63) = 2.447$, $p = .017$, $d = .608$). In response to the Presentation scenario, those in the SAD group had significantly higher levels of guilt ($t(56.475) = 2.682$, $p = 0.01$, $d = .668$) and self-blame ($t(63) = 2.023$, $p = .047$, $d = .504$).

Do the clinical groups differ significantly on measures of post-CFT mood, regret, guilt, etc.? Additionally, the study examined whether the groups differed significantly on these mood variables after generating CFT in response to the scenarios.

In response to the Dinner Party scenario, those in the SAD group evidenced significantly higher levels of self-blame following CFT generation ($t(63) = 2.082$, $p = .041$, $d = .518$). In response to the Presentation scenario, those in the SAD group evidenced significantly higher

levels of regret ($t(63)= 3.074, p= .003, d= .761$), guilt ($t(57.430)=, p= .005, d= .715$), and self-blame ($t(63)= 3.286, p= .002, d= .819$) following CFT generation, as compared to the HC group.

Overall, there were no instances pre- or post-CFT generation in which those in the HC group reported lower mood or higher levels of guilt, regret, or self-blame than those in the SAD group.

Are changes in mood, regret, guilt, etc. related to CFT generation? Does this vary by group? Next, the study examined whether CFT generation patterns (i.e., the relative amount of U-CFT generated) significantly related to changes in mood pre- to post-CFT generation. For instance, did a greater relative amount of U-CFT lead to larger increases in guilt, self-blame, and regret? Results indicated that, for the Car Crash scenario, CFT Difference significantly correlated with changes in Guilt ($r(63)= .245$), self-blame ($r(63)= .394$), and feelings of control over the scenario ($r(63)= .314$), across participant groups. Thus, in the non-social scenario, a greater relative amount of U-CFT was associated with increases in guilt and self-blame, post CFT generation. Further, higher amounts of U-CFT were related to a significantly increased sense of control over the scenario after generating CFT. For the Presentation scenario, CFT Difference significantly correlated with changes in mood ($r(63)=.271$) and regret ($r(63)= .461$), across groups. Thus, a greater relative amount of U-CFT was associated with a significant decrease in mood and increase in feelings of regret post CFT generation in response to the Presentation scenario. No mood change variables were significantly associated with U-CFT generation in the Dinner Party scenario. It is difficult to explain why a lack of significant relationships was found for this vignette.

Further, the study determined whether these relationships varied significantly between the participants groups. For instance, did those with SAD evidence larger increases in negative mood after generating CFT?

The only significant group difference emerged when examining the Presentation scenario. In response to this vignette, those in the SAD group evidenced a significantly stronger relationship between CFT Difference and changes in mood (SAD, $r(32) = -.432$; HC, $r(31) = -.090$; $z = 2.08$, $p = .019$, 1-tailed) such that higher CFT Difference led to more pronounced drops in mood for the SAD group.

Was counterfactual generation related to motivation towards self-improvement?

Does this vary by group?

The study examined whether CFT Difference indexes were related to intentions to behave differently (presumably related to self-improvement or learning from one's mistakes) if a similar situation were to happen again. Across groups, there was a significant correlation between CFT Difference scores and intentions to behave differently in response to the Dinner Party scenario ($r(63) = .345$, $p < .001$) and to the Presentation scenario ($r(63) = .368$, $p < .001$). Thus, when examining the sample as a whole, a greater relative amount of U-CFT was significantly related to a stronger intent to behave differently in the future, at least in relation to the socially-based scenarios.

When examining group differences, results evidenced different patterns of significance, depending on the scenario. Specifically, in response to the Dinner Party scenario, U-CFT Difference was significantly correlated with Future Intentions for the HC group ($r(31) = .509$, $p < .001$), while this relationship was not significant for the SAD group. Conversely, in response to

the Presentation scenario, U-CFT Difference was significantly correlated to Future Intentions for the SAD group ($r(32) = .490, p < .001$), but not for the HC group.

Do CFT generation patterns change after watching the video? Does video content make a difference? Finally, the study determined whether watching a brief video demonstrating CBT techniques, as applied to unhelpful CFT, was effective at reducing subsequent U-CFT generation within the study. Using Difference scores as the outcome measure, results indicated that the CBT video was not significantly successful at reducing U-CFT in either treatment group. Further, a 2x2 ANOVA (video condition x participant group) revealed an effect only for Group ($F(1) = 5.743, p = .020, \eta^2_{\text{partial}} = .086$), but not for Video ($F(1) = .064, p = .801, \eta^2_{\text{partial}} = .001$) or for a Group x Video interaction ($F(1) = .981, p = .326, \eta^2_{\text{partial}} = .016$). This effect revealed that, overall, the SAD group generated relatively less U-CFT following the video, but this occurred regardless of whether they had viewed the CBT-based video or the non-CBT control condition video.

In addition to self-generated U-CFT, the study also gauged changes in Counterfactual Likelihood scale scores pre- to post-video. These analyses likewise found no significant effects for video watched or participant group (Group, $F(1) = .085, p = .772, \eta^2_{\text{partial}} = .002$); Video, $F(1) = 3.144, p = .082, \eta^2_{\text{partial}} = .056$; Group x Video, $F(1) = .083, p = .774, \eta^2_{\text{partial}} = .002$). Thus, the CBT-based video intervention did not appear to have a unique, significant impact on CBT generation patterns within the context of this study.

For whom was the CBT video effective?

Although no significant changes in U-CFT generation were found as a result of the brief CBT video manipulation, the study investigated whether there were any significant differences between those who improved in their counterfactual thinking after the video versus those who

worsened post-video. For those within the CBT video group, improvement was defined as a difference in CBT Difference scores of 1 or greater (representing a decrease in U-CFT generation post-video); worsening was defined as a difference in CBT Difference scores of -1 or less (representing an increase in U-CFT post-video).

Analysis using *t*-tests revealed that the only variable that differed between those who improved post-CBT video (*n*= 28) and those who worsened post-CBT video (*n*= 24) was clinical group membership ($t(26) = -2.449, p = .021$). Specifically, those who improved as a result of the CBT video were significantly more likely to belong to the SAD group than to the HC group (18 participants in the SAD group and 10 participants in the HC group). The groups did not differ significantly on any other demographic variables (e.g., age, gender), personality traits (e.g., extraversion, neuroticism), or measures of depression, anxiety, or RT (e.g., DASS, PEP-Q). The improved versus worsened groups did not differ significantly in scenario presentation order, suggesting that any changes in CFT generation pre- to post-video cannot be accounted for by the order in which participants viewed the videos.

Discussion

Overall, Study 2 had several central aims. First, the findings of Study 1 were extended to a clinically diagnosed Social Anxiety Disorder sample; that is, a truly clinical group was compared to a group of participants judged to be lacking any clinical diagnoses, via a reliable and established clinical interview. Second, a test of moderation investigated for whom upward counterfactual thinking may be maladaptive (i.e., those diagnosed with SAD), and in what contexts. Within the current study, maladaptive U-CFT was judged not only as it related to the uncontrollable, non-repeatable scenarios that were presented (to which all U-CFT generated might be considered maladaptive), but also by subsequent and changes in general mood, emotion, and perceptions of control over the event. Finally, Study 2 tested whether a brief video-based intervention (grounded in CBT techniques) might succeed in reducing U-CFT generation in response to a subsequent scenario (thus reducing potentially maladaptive cognition).

In regards to the second aim, several group differences were observed in terms of counterfactual thinking. Specifically, those in the SAD group generated a greater relative amount of U-CFT (i.e., higher U-CFT Difference) in response to the two socially-based scenarios (i.e., one that depicted an embarrassment at a dinner party and one that depicted an unexpected malfunction during a presentation) than those in the Healthy Control group. These results replicate previous findings (e.g., Kocovski et al., 2005; Monforton et al., 2012), which suggest that SAD symptoms predict a stronger tendency towards “if only...” thinking in response to stressful scenarios and demonstrate that these patterns are significantly different between those with diagnosed SAD and those without any clinical diagnosis. Further, both groups tended to generate a greater number of U-CFT in response to the two social scenarios, which might suggest

that stressful social situations might be more potent precursors of upward counterfactual thinking than are stressful non-social situations.

Similar patterns were discovered using the Counterfactual Likelihood (CL) measures. When examining these state measures of U-CFT, the SAD group evidenced higher scores on all three CL measures. This suggests that those with SAD were significantly more likely to identify with a higher amount of U-CFT statements in both social and non-social contexts than were those in the HC group. Additionally, further analyses revealed that, despite the significance for all three CL measures, those in the SAD group scored significantly higher on the socially-based CL measures than on the non-socially based CL scale. This finding mimics the aforementioned trend towards higher levels of U-CFT in social scenarios among those in the SAD group. Indeed, findings related to both self-generated and Counterfactual Likelihood-based responding suggest that scenario content plays an important role in CFT generation, particularly among those in the SAD group. In other words, disorder-specific content might be an important factor in determining how likely (and to what extent) one is likely to engage in upward counterfactual thinking. Future research might aim towards confirming this more directly, and potentially in the context of other clinical disorders.

Of note, it is interesting that these CFT generation patterns emerged even when the scenarios were uncontrollable and non-repeatable in nature. As outlined above, upward counterfactuals in response to such situations might be considered maladaptive because one cannot strive towards improvement when there was nothing that could have been done differently and when one is unlikely to experience such a situation in the future (e.g., Callander et al., 2007; Markman & Miller, 2006; Markman & Weary, 1996; Roese & Olson, 1995; Ruiselova et al., 2009). These findings imply, then, that those with Social Anxiety Disorder are

more likely to engage in unhelpful forms of counterfactual thinking following a variety of scenarios, and particularly those that are social in nature.

The implication that SAD is related to a tendency towards maladaptive U-CFT was extended in findings related to post-CFT mood and emotions such as guilt, self-blame, and regret (as well as changes in these emotions). Specifically, there were no instances in which those in the HC group evidenced higher levels of regret, guilt, or self-blame or lower levels in mood than those in the SAD group, pre- or post-CFT generation. Nor did those in the HC group evidence greater post-CFT increases in regret, guilt, or self-blame or decreases in mood as a result of CFT generation in relation to any of the scenarios. Further, those in the SAD group evidenced significantly higher levels of post-CFT self-blame in response to the Dinner Party scenario and significantly higher levels of post-CFT guilt, regret, and self-blame in response to the Presentation scenario. Additionally, those in the SAD group evidenced significantly larger increases in guilt and self-blame and decreases in a sense of control pre- to post-CFT in response to the Car Crash scenario and significantly larger decreases in mood and increases in guilt pre- to post Presentation scenario CFT generation. That is, for those in the SAD group, CFT generation is more likely to lead to drastic, negative mood changes than it is for healthy controls, at least among some dimensions.

It is unclear why these significant differences were not consistent across all scenarios, particularly among the social scenarios. Regardless, the findings represent preliminary evidence that those with Social Anxiety Disorder experience stronger levels of (and greater increases in) potentially deleterious emotions following U-CFT generation, as compared with non-anxious individuals. If maladaptive U-CFT is indeed a notable trigger of guilt, regret, and self-blame, it is likely that regular “if only...” thinking may work to maintain symptoms of SAD (e.g., via

avoidance or subsequent anticipatory anxiety), as do established RT constructs, such as rumination. Future research may seek to validate such a maintenance role more concretely.

Additionally, this study examined how patterns of CFT generation related to participants' intentions to behave differently in similar situations in the future. When considering the sample as a whole (i.e., across participant groups), a greater amount of U-CFT was positively correlated with intentions to behave differently in response to the two social scenarios. This suggests that, following an unpleasant social situation, one is more likely to be motivated to learn from their mistakes (and translate this into potentially more adaptive future behaviours) if they have engaged in a greater amount of "if only..." thoughts. When broken down by group, however, the results were inconsistent. In particular, U-CFT generation was significantly correlated with future intentions for the HC group in response to the Dinner Party scenario, but not in response to the Presentation scenario. Conversely, U-CFT generation was significantly correlated with future intentions for the SAD group in response to the Presentation scenario, but not in response to the Dinner Party scenario. The reasoning behind these differences is unclear at this time, particularly that these opposite patterns were observed in scenarios that were both social in nature.

These results are even more difficult to interpret as, in the context of this study, it is unclear whether such intentions to behave differently in the future represent an adaptive process. This equivocation is related to the fact that these scenarios were designed to (and pilot testing confirmed that they did) represent situations where the individual had little to no control and truly could not, within reasonable limits, have done anything differently to prevent the negative outcome from occurring. Thus, it is unclear whether motivation towards self-improvement in these contexts represents a futile cycle of rumination, or whether the mere intention toward

behaving differently might highlight a more adaptive sense of agency, active problem-solving, and self-efficacy. Future qualitative coding of the U-CFT generated in terms of reasonableness (e.g., “If only my friend had thrown out her chair yesterday” versus “If only I would have inspected every leg of my chair before sitting down”) may shed further light on this issue.

In regards to the final aim, this study examined whether a brief, video-based intervention (specifically, one featuring CBT-based techniques) might result in subsequent decreases in maladaptive U-CFT. Regardless of whether self-generated CFT or the CL Likelihood measures were used as an outcome measure, results indicated that the CBT video was not successful at inducing such a change for either participant group. There are several possible reasons why the intervention manipulation was not effective. First, it might be that the 10-minute video was not substantial enough to evoke the intended change. Indeed, while past computer-based interventions were designed to be brief in nature (e.g., Mall et al., 2011), none were as concise as the video presented in the present study. Second, it is possible that the CBT video was not as engaging as previously tested interventions. As participants were informed that they would not have to memorize or answer questions directly related to the video, it is possible that they did not pay close enough attention to the content (which would arguably be necessary for the video to have an impact). Further, the videos were not professionally filmed nor acted, which may have reduced the credibility of the intervention. Finally, it is possible that the participants felt distanced from the intervention, as they may have considered themselves as merely an observer, rather than a client undergoing treatment (since they only had to watch, and were not prompted to respond directly to, the video). Further, participants’ prior experience with therapy or comprehension of/attention to the video were not assessed, all of which are factors that could have altered the effectiveness of the intervention.

When examining for whom the CBT-based video might have been effective (i.e., led to a reduction in U-CFT in a subsequent scenario), an interesting pattern emerged. Specifically, those that improved as a result of the CBT video were significantly more likely to belong to the SAD group than to the HC group. It is possible that those suffering from SAD were more likely to consider the video to be relevant, which might have increased attention, and thus a response, to the intervention. Again, measures of engagement with and attention to the videos as well as past experiences with therapy (or with CBT more specifically) might have clarified this possibility and it is an admitted limitation that these factors were not assessed.

Overall, there are several strengths to the present study. Primarily, the current investigation represents the first attempt to examine patterns of CFT within a clinically diagnosed SAD group, rather than merely correlating levels of SA symptoms with CFT output. This novel endeavour signifies an important attempt to better understand the role of counterfactual thinking in social anxiety disorder and allows for clearer implications in terms of the applications of the findings. Additionally, a strength of this study is that it did not assume that all U-CFT were maladaptive based solely on the content of the scenarios; instead, the study went a step further and also assessed how U-CFT related to primarily deleterious emotions such as guilt, regret, and self-blame. As such, more concrete conclusions about the ways in which U-CFT impacts emotion, particularly for those with SAD, could be drawn. Furthermore, the present study was unique in that it included both self-generation and recognition-based measures of CFT. While self-generated, spontaneous CFTs might be considered the most authentic and ecologically valid, it is quite likely that factors such as alertness, memory, attention, and general levels of generativity might act as barriers to obtaining a true sense of one's CFT tendencies when such measures are used. The inclusion of the CL scales controlled for such hindrances,

allowing participants to consider thoughts that they might actually have in reaction to such scenarios, but were unable to produce in the 5 minutes provided in the self-generation task. Finally, this study included a sample that was diverse in terms of ethnicity, age, and educational background. Not only did it include students from Ryerson University's diverse student population, it also included community members from a variety of backgrounds and vocations. Thus, despite students still comprising the majority of participants, the findings should be more generalizable to an outpatient community sample than many, solely-student based studies.

This study was also not without its limitations. Firstly, the present study did not assess for levels of mood, guilt, and regret before participants read the scenarios, which precluded the ability to measure the effects of reading these scenarios on changes in emotion. Future research, particularly that investigating participants with mood disorders, may examine both baseline mood (including guilt) as well as the impact of engaging with stressful scenarios on these emotions.

Further, a notable limitation was that interrater reliability values were not calculated for the SCID-I, the structured interview used to assess for psychopathology (used to determine eligibility for participant groups). The primary investigator of this study conducted all SCID interview and has had extensive experience administering this interview (i.e., over 100 completed) to assess for anxiety disorders. Future research, however, should implement a second rater to provide a measure of reliability for any clinical interviews administered.

Additional drawbacks of the current investigation relate to sample size and to the implementation of the video-based intervention. It is evident that the size of the participant groups resulted in somewhat under-powered statistical analyses. Although several between-group difference did emerge (which does speak to the strength and validity of these effects), it is

likely that more consistent effects might have emerged had the sample been larger. Time, testing space, and available funds acted as barriers to recruiting more participants for Study 2, but it is hoped that additional participants may be recruited in the future as to increase the power of the analyses. Finally, there were notable drawbacks to the video interventions. First, due to time constraints, the videos were not pilot-tested. As such, the study was not able to test for the potency and relevance of the videos before presenting them to participants. Additionally, as previously noted, non-professional actors and camera equipment were used in the filming of the videos, which may have reduced the credibility of the intervention. Lastly, no measures of attention to or retention of the video content was recorded. As such, the study was not able to control for these variables when assessing the effectiveness of the interventions. Overall, these limitations appear to be directly related to the specific intervention used in this study, as opposed to CFT- and CBT-based video therapy in general. This study, then, represents a nascent attempt as such an intervention that can be used to inform future investigations about the elements of potentially successful (and, in this case, unsuccessful) brief, video-based cognitive therapy for those with SAD.

General Discussion

Taking both studies together, the implications of this dissertation are as follows. Firstly, the investigators appear to have developed valid and reliable measures of state and trait-based counterfactual thinking. These questionnaires correlate significantly with more established measures of repetitive thinking and emotional distress (thereby showing convergent validity) and represent notable advancements in the means by which CFT is measured. The Counterfactual Likelihood measures appear to provide a useful adjunct to self-generated CFT, which should provide a more comprehensive sense of one's tendency to engage in "if only..." thinking following a stressful event. Further, given the significant relationship between maladaptive upward counterfactual thinking and trait measures of worry, rumination, and post-event processing, it is reasonable that trait-level CFT be assessed alongside these measures when gauging RT in anxious individuals. The Upward Counterfactual Thinking Scale appears to be a promising tool for this purpose.

Relatedly, both of the current studies suggest that U-CFT does not appear to be a singular construct; rather, more adaptive forms of the construct (e.g., those which aim towards self-improvement and problem-solving) do not correlate to existing measures of RT and emotional distress in the same patterns as do maladaptive forms of U-CFT (e.g., those which focus on character flaws and uncontrollable aspects of a scenario). Indeed, Adaptive U-CFT relates to constructs such as state positive affect and an internal Locus of Control (i.e., a sense that one has personal agency over the outcomes in one's life). On the other hand, Maladaptive U-CFT relates to constructs such as state negative affect, worry, rumination, symptoms of depression, anxiety, and stress, and a sense that the outcomes in one's life are controlled by chance or by those in authority. These findings strongly suggest that U-CFT that are based on personal flaws, focused

on uncontrollable aspects of a scenario, or are repetitive in nature belong more squarely under the umbrella of RT and pathology than among cognition that promotes self-improvement or problem-solving. Conversely, U-CFT that relates to problem-solving, self-improvement, and controllable, repeatable situations may indeed represent an adaptive process, as postulated in previous CFT research (e.g., Epstude & Roese, 2011; Roese, 1994; Sanna, Chang, & Meier, 2001).

Though a small finding within the grander scale of the study, a particularly interesting relationship that emerged was the significant positive correlation between the Maladaptive subscale of the U-CFT-S and the Learned Helplessness scale. That is, maladaptive U-CFT was related to a sense of futility and a general lack of agency in one's life. This result suggests that thoughts such as "If only I were not so stupid..." and "If only I would have just stayed home that day..." actually relate to a sense of lacking agency and control, rather than to intentions to improve in the future. This finding provides additional evidence that one cannot assume an inherent relationship between "if only..." thoughts and intentions towards future improvement. Further, an inherent sense of learned helplessness in those who tend to generate maladaptive U-CFT might also explain the potentially maintaining role of U-CFT in anxiety and depressive pathology. It will be important for future research to address this more directly.

Further, both studies replicate the finding that U-CFT in response to uncontrollable, non-repeatable scenarios is more prevalent in those higher in SA symptoms, with Study 2 extending the findings specifically to those with a SAD diagnosis. Thus, the presence of social anxiety features appears to increase the likelihood that one will not simply accept and move past the outcomes of an uncontrollable stressful event, but rather will engage repeatedly in attempts to uncover what personal characteristics or actions might have caused this outcome. Additionally,

the findings suggest that such thought patterns evoke negative emotions such as guilt, regret, and self-blame, which may also promote further anxiety, avoidance, and an inability to accept and move past negative outcomes. The studies also highlight the importance of scenario content, as disorder-specific situations may be particularly triggering in terms of maladaptive U-CFT. Indeed, those scenarios with social-evaluative themes appear to result in a particularly large proportion of upward counterfactual thinking for those with Social Anxiety Disorder. This finding provides further support for the hypothesis that maladaptive U-CFT might play a maintaining role in SAD and also suggests that addressing U-CFT patterns in response to social situations might be an important task when treating the disorder.

Taken together, the outcomes of these studies suggest two primary future directions. First, it will be a central goal of to determine whether maladaptive upward counterfactual thinking indeed plays a maintaining role in Social Anxiety Disorder, much like other established forms of RT, including rumination and general PEP. Second, regardless of whether U-CFT is found to be a maintaining factor or solely a prominent feature of SAD, it will be important to integrate the findings of the current studies into CBT-based treatment protocols for the disorder. Given the repeated finding that those with social anxiety tend to use U-CFT in unhelpful, self-defeating ways, educating those with SAD about the difference between adaptive and maladaptive U-CFT might represent an important step in mending the automatic cognitive patterns that prevent SAD clients from facing their fears and engaging in more constructive self-talk. Whether this education be provided in-office or via a well-constructed computer-based treatment, it is apparent that those with social anxiety would benefit from learning how to disengage from unhelpful U-CFT and move past those situations which present no opportunity to learn from one's mistakes.

Appendix A

Counterfactual Likelihood Measure (Presentation Scenario)

Please rate the likelihood that you would have each of the thoughts below as a reaction to the scenario you just read and responded to:

“Not at all Likely” = I would never have this thought in reaction to such a scenario

“Somewhat Likely”= There is a small chance I would have this thought in reaction to such a scenario

“Moderately Likely”= There is a good chance that I would have this thought in reaction to such a scenario

“Definitely”= I would definitely have this thought in reaction to such a scenario

	Not at all	Somewhat	Moderately	Definitely
If only the PowerPoint system had not malfunctioned				
If only my boss wasn't there to see this				
If only I weren't so horrible at presentations				
If only I could have done the presentation in different room				
If only I didn't feel so nervous during the presentation				
If only there were fewer people in the audience				
If only I had another chance to impress my colleagues with my ideas				
If only the remote had worked				
If only I could have predicted that the malfunction would happen				

If only the malfunction didn't confuse me so much				
If only I didn't have to use slides for the presentation				
If only the presentation could have been postponed				
If only I weren't so awkward in front of other people				
If only I didn't care so much about others' impression of me				
If only I hadn't started shaking				
If only today wasn't such a disaster				
If only someone could have helped me solve the problem before the presentation was over				
If only I weren't so inept				
If only my job didn't involve presentations				
If only I could have disappeared				

Counterfactual Likelihood Measure (Dinner Party Scenario)

Please rate the likelihood that you would have each of the thoughts below as a reaction to the scenario you just read and responded to:

“Not at all Likely” = I would never have this thought in reaction to such a scenario

“Somewhat Likely”= There is a small chance I would have this thought in reaction to such a scenario

“Moderately Likely”= There is a good chance that I would have this thought in reaction to such a scenario

“Definitely”= I would definitely have this thought in reaction to such a scenario

	Not at all	Somewhat	Moderately	Definitely
If only I had inspected my chair more closely before I sat down				
If only I had not gone to the party at all				
If only everyone wasn't staring at me				
If only my friend had thrown the chair out when she was supposed to				
If only I weren't such an embarrassment				
If only I hadn't spilled the lasagna when I fell				
If only all parties didn't turn out so poorly				
If only I had sat at a different chair				
If only no one had seen me fall				
If only my friend had cooked a less messy meal				
If only I weren't so heavy				

If only I had been sitting more carefully				
If only I weren't such a klutz				
If only my friends had purchased better quality furniture				
If only I weren't so self-conscious				
If only the chair had broken before dinner began				
If only I had reacted faster to prevent the fall				
If only the party had been at someone else's house				
If only I had eaten quicker so no food would have been on my plate when I fell				
If only I didn't humiliate myself like this all the time				

Counterfactual Likelihood Measure (Car Crash Scenario)

Please rate the likelihood that you would have each of the thoughts below as a reaction to the scenario you just read and responded to:

“Not at all Likely” = I would never have this thought in reaction to such a scenario

“Somewhat Likely”= There is a small chance I would have this thought in reaction to such a scenario

“Moderately Likely”= There is a good chance that I would have this thought in reaction to such a scenario

“Definitely”= I would definitely have this thought in reaction to such a scenario

	Not at all	Somewhat	Moderately	Definitely
If only the driver hadn't fled the scene				
If only the mailbox and railings weren't damaged				
If only I weren't such an unlucky person				
If only the driver hadn't lost control of the car				
If only my quiet Saturday morning wasn't ruined				
If only such terrible things didn't happen to me				
If only I hadn't have done the renovations already				
If only I didn't feel so startled and panicked				
If only the driver had not gotten behind the wheel today				
If only my life weren't filled with so many stressful events				
If only I could have made it outside faster to confront the driver				

If only the driver weren't so careless				
If only there weren't so much traffic on my street				
If only there had been a witness to see what had happened				
If only the Universe wasn't against me				
If only there was a fence in the yard to prevent the driver from reaching the porch				
If only the driver had hit someone else's house instead				
If only I weren't such a magnet for stressful events				
If only the driver had swerved to miss the porch				
If only I had chosen to live somewhere else.				

Appendix B

Upward Counterfactual Thinking Scale

After a situation that turns out negatively, people often think “if only...” and imagine how the situation could have turned out better. For instance, after receiving negative feedback on a project, one might think “if only I had prepared more for this project, I would have received a better grade”. The following questions measure your tendency to think “if only...” following such negative events.

Please read each item carefully and circle the number that corresponds to the way that you generally think. Use the rating scale below:

Never 1	Rarely 2	Sometimes 3	Often 4	Always 5
------------	-------------	----------------	------------	-------------

After a situation where the outcome was negative...

- | | |
|---|-----------|
| 1) I find “if only...” thoughts make me try harder next time | 1 2 3 4 5 |
| 2) I think “if only I were not such a failure” | 1 2 3 4 5 |
| 3) I blame the outcome on my negative personal qualities | 1 2 3 4 5 |
| 4) I find “if only...” thoughts help me learn from my mistakes | 1 2 3 4 5 |
| 5) I think “if only I were smarter, I would not have made that mistake” | 1 2 3 4 5 |
| 6) “If only...” thinking frustrates me because I focus on aspects of the situation I could not have changed | 1 2 3 4 5 |
| 7) “If only...” thinking makes me want to adopt more positive behaviours | 1 2 3 4 5 |
| 8) I think “if only people around me had acted differently, the outcome would have been better” | 1 2 3 4 5 |
| 9) “If only...” thoughts help me prepare for similar situations in the future | 1 2 3 4 5 |
| 10) I blame myself for the outcome, even if there was nothing I could have done differently | 1 2 3 4 5 |
| 11) Thinking of how I could have acted differently makes me feel more in control of similar situations | 1 2 3 4 5 |
| 12) I think the same “if only...” thoughts over and over again | 1 2 3 4 5 |
| 13) “If only...” thoughts give me ideas of how to improve my outcomes in the future | 1 2 3 4 5 |
| 14) I think “If only I was not so stupid, things would have turned out better” | 1 2 3 4 5 |
| 15) I think about how I can change things for next time so that the outcome will be more positive | 1 2 3 4 5 |
| 16) I think “If only I were different in some way” this negative outcome would not have happened | 1 2 3 4 5 |

Appendix C

Presentation Scenario (Social, Non-Repeatable, Uncontrollable)

You have a presentation to do this morning at work, the only talk you have to do all year. You really want to make a good impression since you feel this is your one chance to impress your boss and co-workers. You arrive at work feeling quite nervous, but confident that you have prepared sufficiently. You have been practicing for over a week and feel you have a firm grasp on your topic. As the presentation is about to start, you look around the room to see a large crowd. The talk begins smoothly, as you seem to be holding everyone's attention during the explanation of the first PowerPoint slide. Your colleagues appear interested and you get a good response to a joke you've made. As you click the remote to advance to the second slide, you are confused to see that the slide does not change. You click the remote several more times, yet nothing happens. You notice yourself feeling flustered as you struggle to get the PowerPoint working. You can feel your heart racing and your hands shaking while you apologize for the delay. Suddenly, your slides begin to advance at a rapid rate. You are not even clicking the remote! Confused and embarrassed, you decide to turn off the computer and finish the presentation without slides. Your co-workers appear interested as you finish the talk, but you are afraid that the speech was hurt greatly by the lack of slides. After the talk ends, you receive some supportive comments from your co-workers and learn that your PowerPoint presentation was somehow being controlled by a remote in the room next door. Despite this technical fluke (which others express was not your fault) and the kind words from others, you still feel that your presentation was a disaster and worry about what your colleagues and boss must think of you...

Dinner Party Scenario (Social, Non-Repeatable, Uncontrollable)

You were invited to a dinner party at your friend's house and soon responded that you would be attending. You sometimes feel anxious at parties, however you know that the group would be relatively small and that all of the party guests were people who you knew quite well. You arrive at the party looking forward to an evening of good food and conversation with friends. About an hour into the party you notice that you are having a very nice time. You have been telling your friends about your recent vacation and have been hearing their stories and updates as well. When it is time for dinner, you all sit around the large dining room table, which is decorated with an elegant tablecloth and fancy plates. Half-way through the meal, as you're taking a bite of your friend's famous lasagna, the leg of your chair suddenly snaps and you feel yourself toppling backwards. In the process, your plate of lasagna falls on your lap, then onto the floor, leaving a trail of tomato sauce behind. Once you realize what has happened, you quickly get to your feet. You notice that your heart is racing, your legs feel shaky, and that your face is flushed and warm. Luckily you are not hurt, but you stare horrified at the mess you have made and at all of the eyes that are focused on you. Your friend apologizes profusely, saying that your chair was supposed to be thrown out last week because of its weak leg, but had somehow been overlooked. You accept your friend's apology, but find it hard to ignore the mess you've made and the fact that you are the center of attention...

Car Crash Scenario (Non-social, Non-repeatable, Uncontrollable)

It is Saturday morning and you have just woken up after a restful sleep. You enter your kitchen to get the day started. You turn on the coffee maker and go into the cupboards to get the ingredients for your favourite weekend breakfast. While everything is getting ready, you sit at the kitchen table to check your emails and look at today's news headlines. All seems calm and quiet, and you look forward to your meal and warm drink. All of a sudden, you hear the screeching of car tires and a deafening crashing noise. At the same time, you can feel the walls rattling and the floor shaking beneath your feet. The noise seemed to have come from the front of the building, so you quickly get to your feet and rush to the front entrance. You open the door and are horrified at what you see. A car has crashed into your front porch, totally ruining the mailbox and railings that you and your friend had recently built. You are in complete disbelief and notice your heart racing and head spinning as you try to figure out what has taken place. You notice that the driver-side door of the car is open and that there is nobody inside the vehicle. You gather that the driver must have fled as soon as the crash took place. Taking in the scene, you feel your body tense with shock, anger, and panic. As you try to figure out how to best handle what has just taken place, you can't believe that something like this has happened to you and that all of your recent renovations to the front of your home have been ruined...

Counterfactual Instructions

After experiencing negative situations like the one you read, people often can't help thinking, "if only..." and imagining how the outcome could have turned out better, or thinking "at least..." and imagining how the outcome could have turned out worse. In the space below list as many examples of "if only" thoughts and/or "at least" thoughts that come to mind as you think about the negative situation. You will be given five minutes to complete this task.-

[illegible]

Appendix D

Measures of Regret, Guilt, Self-Blame, Control, and Engagement

(Pre-CFT version)

If a situation like the one you just read were to actually happen to you in real life, how much regret would you feel afterwards?

No Regret	Little Regret	Some Regret	Moderate Regret	Much Regret
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If a situation like the one you just read were to actually happen to you in real life, how much guilt would you feel afterwards?

No Guilt	Little Guilt	Some Guilt	Moderate Guilt	Much Guilt
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If a situation like the one you just read were to actually happen to you in real life, how much would you blame yourself for the negative outcome?

Not at all	A Little	Somewhat	Moderately	Very Much
------------	----------	----------	------------	-----------

Based on the details of the scenario you read, how much control do you feel you had over the negative outcome?

Not at all	A Little	Somewhat	Moderately	Very Much
------------	----------	----------	------------	-----------

How easy was it to imagine yourself in the scenario that you just read? That is, was it easy or difficult to pretend that this situation was happening to you?

Very
Difficult

Somewhat
Difficult

Neither Easy Nor
Difficult

Somewhat
Easy

Very
Easy

If you had a difficult time imagining yourself in the scenario you just read, could you please note why this was? If you did not have difficulty imagining yourself in the scenario, you can skip this section.

(Circle all that apply)

- a) This isn't a situation I would normally get upset/embarrassed/angry about
- b) I would not expect a situation like this to ever happen to me
- c) I have difficulty imagining myself doing something if it has not actually happened
- d) A paper and pencil description is not detailed enough stimulate my imagination
- e) Aspects of the scenario were unclear
- f) Other (please describe below):

Has anything like the scenario you just read ever happened to you?

- a) Yes
- b) No
- c) Something similar, but not identical (Please clarify below)

If Yes or Something Similar, how recently did this event take place? If nothing like this ever happened to you, please ignore this question.

- a) Within the past week
- b) Within the past month
- c) Within the past year
- d) Within the past 5 years
- e) 5 years or longer ago

If something identical or similar to the scenario you just read actually happened to you in real life, how much of an impact (in terms of stress, for example) did this event have on you? If nothing like this ever happened to you, please ignore this question.

No
Impact

Little
Impact

Some
Impact

Moderate
Impact

Great
Impact

(Post-CFT version)

If a situation like the one you just read were to actually happen to you in real life, how much regret would you feel afterwards?

No
Regret

Little
Regret

Some
Regret

Moderate
Regret

Much
Regret

If a situation like the one you just read were to actually happen to you in real life, how much guilt would you feel afterwards?

No
Guilt

Little
Guilt

Some
Guilt

Moderate
Guilt

Much
Guilt

If a situation like the one you just read were to actually happen to you in real life, how much would you blame yourself for the negative outcome?

Not at all

A Little

Somewhat

Moderately

Very Much

Based on the details of the scenario you read, how much control do you feel you had over the negative outcome?

Not at all

A Little

Somewhat

Moderately

Very Much

Based on the details of the scenario you read, how much would you intend to behave differently the next time something similar happened?

- a) I would behave in the exact same way as I did in the scenario
- b) I would behave slightly differently than I did in the scenario (change a thing or two about my actions)
- c) I would behave much differently than I did in the scenario (change many things about my actions)
- d) I would behave totally differently than I did in the scenario

Appendix E

Video Transcript (CBT)

Therapist: So today we agreed to talk about some of the thoughts you've been having in response to negative events. Is that still something you'd like to discuss?

Client: Yes, definitely.

T: Ok, is there a specific situation that stands out as something you'd like to focus on?

C: Well, I had a really bad experience with a sales clerk last week. It was so embarrassing.

T: Can you tell me more about that?

C: I was shopping in a high-end boutique, which I don't normally do, taking a look at some new clothing for spring. I didn't know if I could afford anything, but thought I'd take a look in case I found any good sales.

T: Yes, tell me more.

C: I was looking at some jeans on the sales rack when the sales lady came up to me and said "Did I just see you put something in your purse?" I was shocked because I definitely hadn't! She looked very intimidating and I got so upset and flustered that I didn't know what to say. I assumed she mistook my silence and anxiety for guilt, which made me even more nervous. I also saw a few other customers looking my way with curious faces, which made my heart race and my face get really hot.

T: My goodness. What happened next?

C: After a few moments, I managed to say "no" and opened my purse to show her nothing was inside. She half-apologized, but still looked pretty scary. Even though I was glad she believed me, I was so upset and embarrassed that I immediately left the store and went home.

T: That sounds like a very stressful situation, and one that evoked a lot of thoughts and emotions for you. I'm sorry to hear that happened. One strategy for reflecting on experiences like this is an exercise called a Thought Record. Can I show you what it looks like?

C: Yes, for sure.

T: (Therapist sits beside client to show them the handout). So Thought Records are a method of breaking down upsetting situations in ways that highlight our reactions and give us a chance to look at these reactions in a more formal, constructive way. As you can see, the sheet is divided into several columns that ask you to record some information about the situation and your impressions of it. Let's focus on the first three columns for now.

C: Ok.

T: The first column simply asks you to describe the situation with a bit of detail. What happened, where you were, etc. Can we fill this in for the situation you just described?

C: Sure. I would write something like “In a boutique, got accused of shoplifting by scary sales lady”

T: Ok, that works well. Let’s write that. (Client writes it down). Now the second column asks you to record the specific emotions you were feeling as a result of that situation. Do you remember what emotions came up at the time? I think you already mentioned one-embarrassment?

C: Yes, definitely embarrassment. I also felt anxious, scared, flustered, and maybe a bit sad.

T: Yes, those all sound like emotions you would have been feeling. How about you write those down in the second column? (Client writes them). Any other emotions?

C: No, I think that’s it.

T: Ok. The next column asks you to record your “Automatic Thoughts”; these are thoughts that you have in response to negative situations, things you might tell yourself so often that you might not even realize you’re thinking them. They can be worries, self-criticism, or just impressions about yourself or the situation. Sometimes identifying thoughts like this can be difficult, but do you think we could try to figure some out together?

C: Sure. I can already think of a few.

T: Great! What thoughts are coming to mind in relation to the situation you just described?

C: I thought “If only I hadn’t gone to that boutique.” I’m not rich or classy enough for a place like that. I also thought “If only weren’t so awkward in social situations”. I really embarrassed myself!

T: Those are great examples of automatic thoughts! Definitely a good start to this column. So if I heard correctly, your thoughts were “If only I hadn’t gone to that boutique” and “If only I weren’t so awkward in social situations”. Is that correct?

C: Yes. Should I write them down?

T: Yes. (Client writes them down). Any other thoughts that you can remember? Perhaps any related to the anxiety or fear?

C: Well, I was definitely focusing on my physical symptoms, so I had thoughts like “She can hear my heart racing and see me blushing!” and “I’m going to faint”.

T: Ok excellent. (Client writes them down). Any other thoughts tied to the flustered or embarrassed feelings?

C: Well, I feel like I embarrass myself a lot. I know I was thinking “If only I weren’t such an embarrassment”

T: Ok, great that you could remember that. I can definitely see how that would be related to feelings of embarrassment and maybe sadness. Let’s write that one down too.

C: Ok (writes down).

T: Now the next step is to identify the “hot thought”, which is the thought off the list that evoked the strongest emotional reaction or most closely associated with all of the emotions that you listed earlier. Although many of the thoughts can be emotional, there’s often one that stands out as the most prominent. Do any of the thoughts you’ve listed stand out in this way?.

C: Well.. (thinks)... “If only I weren’t such an embarrassment”. That one really stands out. I think that’s the hot thought.

T: Ok. I can definitely see that as being a very powerful thought. So let’s circle that one, and we’ll focus the rest of the thought record on that particular thought. Ok?

C: Sure (circles thought).

T: So the next two columns ask you to analyze or break down that thought a bit. Because thoughts like the one you just circled are often automatic, we rarely take the time to look at them more closely and analyze them. We accept them as truths rather than evaluating whether they’re fully correct. So these two columns ask you to record evidence that your hot thought is actually true and then evidence why the thought might not actually be 100% true. Does that make sense?

C: I think so. But I’m pretty convinced these thoughts are the truth. It might be hard to take a different perspective.

T: Absolutely. Thought Records can be tricky in the beginning because we’re not used to looking at our thoughts in this way. And the goal definitely isn’t to take an idealistic, rosy perspective only- as there may sometimes indeed be truth to our thoughts- it’s really a more balanced view that we’re aiming for. Would you like to try to complete these columns together?

C: Yeah, for sure. I can see that it might be helpful.

T: Great. So first off, let’s gather some evidence for why the statement “If only I weren’t such an embarrassment” might be true. This may be the easy part. What comes to mind for you for this column?

C: Well, I always embarrass myself in social situations. All the time, really.

T: Can you think of any concrete examples?

C: Well, just yesterday I tripped on the subway in front of everybody. I heard someone laugh. And last semester I gave a presentation and stumbled through the whole thing.

T: So these examples seem to support for you the idea that you're really an embarrassment. How about you write those down? (Client writes them). Anything else for this column?

C: I used to get teased a lot in high school. That was definitely because I was doing embarrassing things all the time. That's evidence for sure.

T: Yes, we've talked about the teasing in the past. Sorry again to hear that you experienced that. How about you add that to the column? (Client writes it). So I think that's a good start on that column. Now how about the next one? As I said, this may be a bit more difficult. But can you think of any evidence that the statement "If only I weren't such an embarrassment" might not be 100% true?

C: Hmm, not really.

T: Was there ever a time when you didn't embarrass yourself?

C: Well, sure.

T: So is it fair to say that you can sometimes complete a task or engage in a situation without feeling embarrassed.

C: Yes, that's fair.

T: So what statement would you write, based on that idea?

C: I guess "I can sometimes do things without embarrassing myself"

T: Great. Write that down. (Client writes). What about relating to this recent experience at the store? Are you certain that you really embarrassed yourself in the store?

C: Well, I definitely felt embarrassed. But I guess it wasn't as big of a scene as I imagined it to be.

T: Can you tell me more about that?

C: Well, it's not like I was singled out in front of a crowd. That helped. I think I sometimes exaggerate how embarrassing things actually are.

T: That makes sense, should you write that last statement down, then? About exaggerating?

C: Sure, I think that's an important thing to remember.

T: Anything else about the specific situation?

C: I don't know. I still feel embarrassed and can't stop imagining how things could have turned out differently.

T: Hmm, so it sounds like that "If only..." thinking is really popping up a lot in relation to this event.

C: Yes, definitely.

T: Sometimes "if only..." thinking can be helpful, because it motivates us to improve. For example, even though the thought "If only I would have studied harder, I would have done better on the test" may make us feel sad or regretful, it may actually motivate us to do better in the future, like study harder. Does that make sense?

C: Yes it does.

T: But other times, "If only..." thinking might not be helpful, especially when we're focusing on situations when you really couldn't have done anything differently. In that instance, the thoughts are causing negative mood without the chance to improve your behavior, because you did nothing wrong in the first place. Like in the situation you just mentioned. Do you see how that applies?

C: Well, I shouldn't have been shopping there at all. Or maybe I should have been wearing a nicer outfit.

T: I hear what you're saying. But do you think those thoughts are realistic? Is there any way you could have predicted that you were going to be accused of shoplifting?

C: No, not really.

T: And did any of your behaviours in the store give the sales lady a valid reason to accuse you?

C: Well, no, I was just minding my own business. I wasn't doing anything strange.

T: So it sounds like the negative outcomes of this event were largely out of your control? That maybe the situation was the fault of an overly-critical salesperson?

C: Hmm, I see what you're saying. I wish I had been a bit more assertive, but yes- she's the one who really should have acted differently.

T: And I realize that coming to conclusions like this may be difficult, as self-blame and criticism can be so automatic. It can be really difficult to realize when we haven't done anything wrong. But even small shifts in perspective can be meaningful.

C: Yeah, I guess that's true. I'm still embarrassed about the whole thing, but I realize I shouldn't blame myself so much.

T: Absolutely. So does it make sense that "if only..." thinking might not be so helpful after this type of situation? One where you didn't much control over the situation?

C: Yes, I can see how thoughts like this can sometime lead nowhere. Except to feeling guilty. But it's hard not to have them!

T: Definitely. But luckily, that's where Thought Records come into play! So the final column is asking you to come up with a balanced thought. One that kind of combines the findings from the "Evidence For" and "Evidence Against" columns. After looking through the Thought Record, can you think of a more balanced version of "If only I weren't such an embarrassment?"

C: Hmmm... How about, "I know I can sometimes embarrass myself because I am not assertive, but sometimes other people are to blame for stressful situations"

T: That's perfect! Great job.

Video Transcript (Non-CBT)

Therapist: So today we agreed to talk about some situations you experienced over the past week that might have been stressful or anxiety-provoking for you. Is that still something you'd like to discuss?

Client: Yes, definitely.

T: Ok, is there a specific situation that stands out as something you'd like to focus on?

C: Well, I had a really bad experience with a sales clerk last week. It was so embarrassing.

T: Can you tell me more about that?

C: I was shopping in a high-end boutique, which I don't normally do, taking a look at some new clothing for spring. I didn't know if I could afford anything, but thought I'd take a look in case I found any good sales.

T: Yes, tell me more.

C: I was looking at some jeans on the sales rack when the sales lady came up to me and said "Did I just see you put something in your purse?" I was shocked because I definitely hadn't! She looked very intimidating and I got so upset and flustered that I didn't know what to say. I assumed she mistook my silence and anxiety for guilt, which made me even more nervous. I also saw a few other customers looking my way with curious faces, which made my heart race and my face get really hot.

T: My goodness. What happened next?

C: After a few moments, I managed to say "no" and opened my purse to show her nothing was inside. She half-apologized, but still looked pretty scary. Even though I was glad she believed me, I was so upset and embarrassed that I immediately left the store and went home.

T: That sounds like a very stressful situation, and one that evoked a lot of emotions for you. I'm sorry to hear that happened.

C: Thank you.

T: So you mentioned that embarrassment was an emotion that you felt as a result of this event. Is that correct?

C: Yes, I was mortified! One of the most embarrassing situations I've experienced in a while.

T: Again, I'm sorry that you had such a negative experience. Given what we've discussed about your feelings in social situations, I can see how this situation would have evoked embarrassment for you. Were there any other emotions that came up then?

C: Well, I also felt anxious, scared, flustered, and maybe a bit sad. Yeah, definitely a mix of embarrassment, anxiety, and sadness.

T: Ok. It's great that you were able to identify so many emotions! Sometimes it takes a lot of practice to notice the specific feelings we're having, especially when we are in distress, so I think you're doing a great job at outlining that for me.

C: Thanks. The feelings were pretty strong, which made them pretty easy to notice.

T: It does sound like the emotions were quite strong, given what happened. On a scale of 1-10, how much distress you were experiencing right after the incident at the store took place?

C: Gosh, I was feeling pretty terrible. I'd say 9 out of 10.

T: Ok, a 9 out of 10. That does indicate you were feeling quite upset. We've talked in the past about how implementing coping skills during time of distress can be incredibly helpful both in the long and short-term. Maybe we can review how you reacted to the situation and see what coping skills you did employ? And then maybe look at some alternative coping you could try to incorporate next time when you're feeling really upset?

C: Yes, that sounds like a good idea. I know we've talked a lot about coping in the past, but I usually forget to use those strategies when I'm upset. The anxiety just takes over!

T: Yes, we've talked about how high levels of anxiety can take up a lot of our resources, making it difficult to use our active coping skills. But the more we practice coping skills here together, the easier it should be on your own. Does that make sense?

C: Yes, it does. I would definitely like to get more practice!

T: Ok. Let's first review how you reacted to the situation in the store this week. So you've mentioned that after the incident you left the store and headed home. Is that right?

C: Yes. I was too embarrassed to stay, so I had to leave. I just wanted to be alone.

T: Yes, that makes sense. Let's try to break it down even further. So after the altercation with the sales lady, you left the store. Were you outside on the street then?

C: Yes, it was a boutique on Queen St.

T: Ok, so you were standing outside, feeling embarrassed, anxious, and sad. Am I describing that correctly?

C: Yes, that sums it up!

T: Ok, so how did you make the decision to head home?

C: Well, the distress I was feeling was making me feel quite unsteady... and I guess, vulnerable. I was fighting back tears, so was extra embarrassed that someone might see me crying or looking upset. I wanted to be somewhere where I could relax and not worry about looking upset, so home was the place!

T: Ok, so it sounds like you were feeling really vulnerable and didn't want anyone to notice that you were upset. So home felt like a place where would be comfortable and safe.

C: Yes, that's exactly it.

T: So how would you describe the coping skills that you used?

C: Well, I removed myself from the stressful situation. I didn't want to feel uncomfortable and out of control in public, so I quickly got somewhere that I would feel more relaxed and comfortable. Once I got home, I tried to do some relaxation strategies to calm down a bit.

T: Ok, great. You described your coping quite well. So it sounds like the two main strategies you used were to get yourself to a more relaxing and safe environment and then to practice some relaxation techniques. Does that sum it up?

C: Yes, that's about it.

T: Did you find these strategies to be helpful?

C: Well, going home definitely helped calm me down a bit. I felt less shaky and vulnerable for sure. And the relaxation techniques were pretty helpful too. I was able to focus on my breath, which was a good distraction from the embarrassment and helped calm me down a bit more.

T: Great! It sounds like the strategies were quite helpful! Glad to hear they aided in calming you down and making you feel safer. Would you say these strategies were effective enough to use next time?

C: Hmm... well, even though they helped a bit, I don't know if they were the best. I don't know...

T: Can you tell me more about that?

C: Well, even though I felt more relaxed and less shaky, I still felt pretty sad and embarrassed. Going home didn't erase those feelings. I still felt ashamed and, I guess, kind of disappointed in myself.

T: I'm sorry to hear you felt that way. So, it sounds that going home and deep breathing helped calm the anxiety, but didn't help with the sadness and embarrassment?

C: Yes.

T: Can you tell me more about that?

C: Well, going home didn't erase what had happened. I was still thinking about it quite a bit. And I was disappointed in myself because I felt like I had just run away from my problems. I wish I had been more assertive with the sales person. Because I let her upset me so much that I had to go home, I ruined a perfectly fine afternoon. I had been planning an afternoon of shopping, walking, and relaxing, and that was totally cut short. It was supposed to be a fun afternoon and I feel like I cheated myself out of it!

T: Ok, so I heard a few things there. It sounds like even though going home helped calm you down, it didn't erase the situation that had happened and still left you feeling sad and disappointed. Particularly because you felt like you had let yourself down. Is that right?

C: Yes.

T: I also heard that you wished you had been more assertive with the salesperson and that you had been able to stay out and enjoy the afternoon.

C: Yes, I kept thinking that I should have done those things. I would have felt stronger and prouder of myself if I could have done those things.

T: Ok. So I understand how thinking about those alternative courses of action could make you feel upset because they highlight ways you wish you could have acted.

C: Yes, I felt a lot of regret.

T: Ok. And that's understandable, given what we've talked about. But I also think that it's great you were able to think of these alternative courses of action, because these thoughts can quite easily be turned into new coping goals in the future. Behaviours to work towards next time you're feeling anxious, upset, or embarrassed. Does that make sense?

C: I guess. You mean, I can practice to be assertive and not run home next time?

T: Exactly. Is that something that you would like to work towards?

C: Well, yes. I want to be more assertive and I don't want relaxing days to be ruined like that! But standing up for myself and calming down right away so I won't have to go home sound really hard!

T: Absolutely! Any new behaviour, especially those that make us feel anxious, can be quite difficult to try. But luckily, we can talk them through and practice here in the office before you try them in the 'real world'. Is that something you'd like to work on?

C: Yes, let's give it a go.

T: Ok, great. Well, you've mentioned two possible strategies: Being more assertive and staying out/not going home when you're upset. It's always best to start with the less 'scary' option first and later work up towards the more anxiety-provoking situations down the road. Which of the two do you think would be easiest to start with?

C: Well, standing up to the sales lady feels pretty impossible. Like 100% scary. Maybe we can start with how I could not go home next time I'm upset?\

T: Sure, that sounds like a great plan. So let's see- let's go back to the previous situation, when you had just left the store and tried to figure out what to do next.

C: Ok.

T: So, if you can imagine yourself in that situation as you've described- feeling embarrassed, upset, shaky, and sad, and feeling like you need to go home.

C: Ok. It's pretty easy to imagine.

T: Ok, great. So you can feel that the urge to go home is pretty strong. What could you do to make staying out seem easier?

C: Well, I could tell myself "No, I want to stay out. I want to be strong and enjoy the rest of the afternoon!"

T: Ok, that sounds like a good start! Self-talk can be great for motivation and calming yourself down. Do you think that would be enough?

C: Well, no. I'd still be tempted to go home. But I'd keep saying that to myself until I believe it.

T: Wonderful. The more we hear our positive self-talk, the more likely we are to believe it and calm down. What else could you do? I think it might be helpful to have a behavioural plan, a concrete plan of action of what to do next.

C: Ok, well I was feeling nervous and self-conscious, so I doubt I'd want to go anywhere crowded. So maybe I could start with somewhere more private and quiet?

T: Yes, that sounds like a great plan! No need to start with somewhere busy and overwhelming. That would make it even more difficult to not go home. Starting somewhere more manageable is a wonderful place to start. Can you think of any locations like that?

C: Well, I have a favourite coffee shop. There are a few locations around the city. It's not usually that busy, and even when it is, there are always nooks in the shop where I can have some privacy. I could go there, maybe?

T: I think that sounds like a fantastic plan. A plan that would let you stay out in public and calm down in a private, yet enjoyable environment. And maybe even let you relax enough to feel good again and get some enjoyment out of the rest of your day.

C: Yes. It may not be perfectly easy, but I'd definitely like to try that next time.

T: Great!

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Glossary

CBT = Cognitive Behavioural Therapy
CFT= Counterfactual Thinking
CL= Counterfactual Likelihood
DASS-21= Depression Anxiety Stress Scales
HC= Healthy Control
ISI= Insomnia Severity Index
KMO= Kaiser Meyer Olkin
LHS= Learned Helplessness Scale
LOC= Locus of Control
PANAS= Positive and Negative Affect Scales
PCA= Principal Components Analysis
PEP= Post-event Processing
PSI= Problem-Solving Inventory
PSWQ= Penn State Worry Questionnaire
RSQ= Response Styles Questionnaires
RT= Repetitive Thought
SA= Social Anxiety
SAD= Social Anxiety Disorder
SCID= Structured Clinical Interview for the Diagnostic and Statistical Manual of Mental Disorders
SES= Self-Efficacy for Sleep Scale
SPIN= Social Phobia Inventory
U-CFT= Upward Counterfactual Thinking
U-CFT-S= Upward Counterfactual Thinking Scale