Modifying social anxiety related to a real-life stressor using online Cognitive Bias Modification for interpretation☆

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ABSTRACT

Modifying threat related biases in attention and interpretation has been shown to successfully reduce global symptoms of anxiety in high anxious and clinically anxious samples (termed Cognitive Bias Modification, CBM). However, the possibility that CBM can be used as a way to prevent anxiety associated with an upcoming real-life stressful event in vulnerable populations has yet to be systematically examined. The present study aimed to assess whether a two-week course of online CBM for interpretations (CBM-I) could reduce social evaluative fear when starting university. Sixty-nine students anxious about starting university completed five sessions of online CBM in the two weeks prior to starting university, or completed a placebo control intervention. Results indicated that CBM-I reduced social evaluative fear from baseline to day one of starting university to a greater extent than the placebo control intervention. Also, there was a greater reduction in state anxiety and a trend indicating a greater reduction in social evaluative fear in the CBM-I group at 4 weeks follow-up. Results suggest that CBM-I could be used as a preventative tool to help reduce anxiety specific to challenging life events.

Threat-related cognitive biases in selective attention and in the interpretation of emotional ambiguity are known to be associated with high levels of anxiety. A recently developed technique, known as Cognitive Bias Modification, attempts to directly erode such biases in high and clinically anxious individuals in order to reduce anxiety symptoms. This is achieved using computer based tasks in which participants are required to repeatedly practice making positive interpretations of emotionally ambiguous words or scenarios (Cognitive Bias Modification for interpretation, CBM-I) or to decrease selective attention to threat-related stimuli (Cognitive Bias Modification for attention, CBM-A) (see Hertel and Mathews (2011) for a review).

So far, the majority of studies with high or clinically anxious volunteers have been conducted using CBM-A, with very encouraging results. For example, Amir, Beard, Burns, and Bomyea (2009) showed that eight 20 min sessions of CBM-A can significantly reduce anxiety in individuals with Generalized Anxiety Disorder. Amir, Bread, Taylor, et al. (2009) showed that eight sessions of CBM-A resulted in 50% of a social phobia sample no longer meeting diagnostic criteria following the intervention (as compared to 14% in the control condition), and therapeutic effects were maintained at a four month follow-up. Schmidt, Richey, Buckner, and Timpano (2009) found similar results when treating Generalized Social Anxiety Disorder. Eight sessions of CBM-A resulted in significant reductions in social and trait anxiety, and 72% of patients who received CBM-A no longer met DSM-IV diagnosis criteria (as compared to 11% in the control group). Again therapeutic benefits were maintained at 4 month follow-up.

Recent studies suggest that CBM-I also may be effective in reducing elevated anxiety. For example, Mathews, Ridgway, Cook, and Yiend (2007) found that CBM-I served to lower trait anxiety in a high anxious population over four sessions. Similarly, Salemink, van den Hout, and Kindt (2009) also demonstrated that multiple CBM-I sessions led to significant reductions in trait anxiety, as well

as state anxiety and general psychopathology. Beard and Amir (2008) found reductions in social anxiety symptoms following CBM-I in a highly socially anxious population. Hirsch, Hayes, and Mathews (2009) showed that CBM-I significantly reduced levels of worry in a sample of high worriers. We are aware of only four studies that have attempted to use CBM-I in a clinically anxious population where clinical status of the participants was confirmed using diagnostic interviewing. Two of these used a combined package of CBM-I and CBM-A, and showed significant reductions in state and trait anxiety in those with Generalized Anxiety Disorder or Social Anxiety Disorder (Brosan, Hoppitt, Shelfer, Sillence, & Mackintosh, 2011), and in symptoms of social anxiety and a behavioural indicator of performance anxiety in those with Social Anxiety Disorder (Beard, Weisberg, & Amir, 2011). Amir and Taylor (2012) used CBM-I to treat Social Anxiety Disorder, and showed CBM-I could significantly reduce clinician rated social anxiety, trait anxiety and depression. The remaining study found that CBM-I reduced negative thought intrusions in individuals with Generalized Anxiety Disorder (Hayes, Hirsch, Krebs, & Mathews, 2010).

Of particular interest to clinicians and researchers is whether these techniques could be used as a preventative strategy in populations vulnerable to the future development of anxiety disorders, to reduce anxiety and distress associated with the anticipation of an upcoming challenging life event, and/or the anxiety associated with being in the middle of challenging circumstances. Consistent with this possibility, there is encouraging laboratory evidence that CBM-I can reduce reactions to subsequent stressful events in non-anxious populations. For example, Wilson, MacLeod, Mathews, and Rutherford (2006) first demonstrated that modifying interpretive bias in either a threat or non-threat direction impacted on anxiety vulnerability in response to watching a film containing scenes of real-life accidents. Participants in the threat interpretation training condition showed greater increases in anxiety whilst watching the film as compared to participants in the non-threat interpretation training condition. Using an identical stressor, Mackintosh, Mathews, Yiend, Ridgeway, and Cook (2006) demonstrated that such effects of CBM-I on anxiety vulnerability can last for at least 24 h post-training.

The critical issue from a clinical perspective is of course whether these effects hold when examining more ecologically valid stressors. To our knowledge, only one published study has attempted to utilize CBM to ameliorate negative emotional response to a real life stressful event, and this study evaluated the impact of CBM-A rather than CBM-I. See, MacLeod, and Bridle (2009) investigated whether CBM-A could reduce the distress associated with a move to Australia and starting university, in a non-clinical sample of Singaporean students. Two and a half weeks before they made the move, participants completed pre-intervention measures of state and trait anxiety. Across the ensuing 15 days the students either completed daily online CBM-A sessions (CBM-A condition) or else completed a placebo version of the task which was not configured to modify attentional bias (no-training control condition). On arrival in Australia the students were asked to fill out post-intervention measures of state and trait anxiety. The results indicated that CBM-A, compared to the control condition, was successful in reducing threat-related attentional bias, and this resulted in significantly lower levels of trait anxiety, and attenuated state anxiety responses to the event of moving to Australia. Unfortunately, in this study there was no longer term follow-up to determine if the benefits of CBM persisted beyond the first day. Moreover, this study did not select participants who were particularly vulnerable to anxiety concerning the potential stressor, and it is important to establish if the effects will hold in these individuals. Nevertheless, this initial study paved the way for further work investigating the use of

CBM in a preventative way, to reduce threat-related bias before a challenging real-life event.

The aim of the present study was to assess for the first time whether similar findings could be attained using CBM-I (designed to modify selective interpretation) in relation to anxiety in participants experiencing a similar stressful life event and in a sample vulnerable to anxiety. Furthermore, we aimed to assess whether such beneficial effects last beyond the initial day of the stressful event, to help individuals continue to cope better emotionally with the event. Finally, we were also interested in examining whether training one type of bias (interpretive bias) would lead to transfer to another type of bias (attentional bias). Such transfer effects of training have received little attention in the literature and we know of only one published study that has assessed transfer of interpretive training to attentional bias. Amir, Bomyea, and Beard (2010) modified interpretive bias using a Word Sentence Association Paradigm and examined its impact upon attentional bias (as assessed by a modified Posner task). They found that interpretive training successfully modified both interpretive and attentional biases. Such findings are important theoretically in that they support models of anxiety which propose that information processing biases work together and stem from a common mechanism to maintain symptoms (e.g., Bishop, 2007; Mathews & Mackintosh, 1998). Furthermore, therapeutically, if training one bias can impact upon another bias it tentatively implies that focusing an intervention on the modification of one cognitive bias (e.g., interpretation), as opposed to concurrently training other biases (e.g., attention) could be sufficient.

In the present study, the challenging event was the move to university (University of East Anglia in the UK) for students who had self-identified as being anxious about this upcoming event. This is a stressor that is likely to lead to significant elevations in anxiety in the weeks prior to start of university due to anticipatory processing, and for anxiety to continue to be elevated once university actually starts. We aimed to attempt to use CBM-I to increase positive interpretive bias in the weeks leading up to this potential stressor, such that those in the intervention group would be more able to interpret the event in a positive way and situations that they might find themselves in a more positive manner than those in the control group, thereby reducing anticipatory anxiety.

The students were offered five sessions of CBM-I, delivered online in their home setting, across the two weeks prior to the start of the university semester. Pre and post-intervention, measures were taken not only of interpretive bias, but also of attentional bias, to determine transfer of training from interpretation to attentional bias (as previously found by Amir et al., 2010; but not yet replicated). We also assessed social anxiety, and more general anxiety, prior to the CBM-I intervention, on the day of commencing university, and at a follow-up four weeks into the university semester to examine longer terms effects of CBM-I. This allowed us to assess not only anxiety associated with the actual commencement of university (day one) but also anxiety levels during the first semester of university (four-week follow-up), which would give an indication of how participants are coping emotionally with the continuing stress associated with this new situation. The CBM-I training focused on modifying the interpretation of emotionally ambiguous social scenarios, related to the kind of anxieties thought likely to be associated with beginning university; social evaluative situations (such as whether one will be liked by one's new friends) and performance evaluative situations (such as how well one will be able to get on with one's studies). We therefore had as our main outcome variable Fear of Negative Evaluations (FNE, Watson & Friend, 1969), with the prediction that CBM-I should significantly reduce this fear, with effects being maintained at follow-up, as compared to the placebo control condition. We also predicted that