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ANXIETY DISORDERS (A PELISSOLO, SECTION EDITOR)

Metacognitive Therapy for Anxiety Disorders: a Review of Recent Advances and Future Research Directions

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Abstract

Purpose of Review This review describes (a) key features of the metacognitive model as they relate to anxiety and related disorders, (b) central components of metacognitive therapy (MCT), (c) the current empirical status of MCT, (d) recent developments, (e) controversies and (f) future research directions.

Recent Findings Evidence is accumulating that MCT is effective for anxiety and related disorders. Emerging evidence suggests that MCT may be effective with children and adolescents and compares well to other evidence-supported treatments such as cognitive behaviour therapy and mindfulness-based approaches. Evidence for distinct mechanisms across therapies is mixed.

Summary While MCT appears to be effective for anxiety and related disorders, more research is required to evaluate (a) efficacy and unique (vs. common) mechanisms of change compared to other therapies, (b) effectiveness for children and adolescents, (c) alternative delivery methods (e.g., via internet, group vs. individual), (d) transdiagnostic impacts and (e) applications to a broader array of disorders.

Keywords Metacognitive therapy · Anxiety disorders · S-REF model · Review

Introduction

Internationally, anxiety disorders are more common than any other class of mental disorder [1–5]; they can be debilitating and costly [6], and they are often comorbid with other anxiety disorders and with other classes of mental disorders (e.g., affective and substance use disorders) [7]. Anxiety disorders also frequently precede the onset of affective and substance use disorders, suggesting that they may prospectively increase risk for additional diagnoses [8]. Comorbidity is associated with more chronic illness, service use, and functional disability [7, 9], so it is critical that treatments can efficiently target multiple disorders, particularly given that clients are more likely to present with comorbid rather than single mental disorders in clinical practice [10].

Disorder-specific cognitive behaviour therapy is effective for panic disorder and agoraphobia [11], social anxiety disorder [12–14], specific phobias [15] and generalised anxiety disorder (GAD) in adults and children [16–18]. These interventions target beliefs, behaviours and somatic symptoms that are theorised to maintain fears of physical symptoms of anxiety (panic disorder), situations from which escape or assistance are perceived to be unavailable (agoraphobia), negative evaluation (social anxiety disorder), particular objects or situations (specific phobias) or free-floating and uncontrollable worries about a range of topics (GAD). In contrast to identifying disorder-specific cognitive content and processes, transdiagnostic treatments target mechanisms that maintain multiple anxiety disorders, and therefore have the potential advantage of simultaneously and more efficiently treating principal and comorbid disorders using a single protocol [19]. Metacognitive therapy (MCT) is a transdiagnostic intervention that aims to modify processes that maintain cognitive and emotional dysregulation across mental disorders. While MCT has been applied to a range of disorder classes, the focus of this review is anxiety and related disorders.

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Metacognitive Model of Anxiety Disorders

Wells [20] defines metacognitive knowledge as "the beliefs and theories that people have about their own thinking (p.5)." Wells and Matthews proposed the Self-Regulatory Executive Function (S-REF) model of emotional disorder, which comprises three levels of cognition including automatic processing, voluntary processing, and declarative knowledge or self-beliefs [21]. Within the S-REF model, declarative and procedural beliefs guide attention, memory retrieval, appraisal and other metacognitive activities in response to internal and external stimuli. Wells and Mathews describe the cognitive-attentional syndrome (CAS) as a particularly pernicious mode of processing that perpetuates emotional disorder, and which is characterised by heightened self-focused attention (e.g., repetitive negative thinking such as worry), reduced cognitive efficiency, activation of self-beliefs and self-appraisal (e.g., I cannot cope, I am weak), attentional bias (e.g., threat monitoring) and associated limitations in cognitive capacity [21]. The CAS is controlled by positive and negative metacognitive beliefs about the importance of thoughts. Positive metacognitive beliefs refer to the perceived helpfulness of thoughts, which serves to increase engagement in repetitive negative thinking. Examples of positive metacognitive beliefs are that repetitive thinking helps one to solve problems, to be prepared for all eventualities and to prevent harm. Once the individual engages in repetitive thinking to achieve the perceived benefits, the activation of negative metacognitive beliefs distinguishes individuals who will or will not develop emotional disorder. Specifically, individuals who believe that repetitive thinking is uncontrollable (e.g., "I can't do anything to stop my worry") and harmful ("My worry will make me sick") will begin to worry about their worry, which, in turn, can lead to a range of dysfunctional attempts at controlling thoughts. For instance, individuals may engage in thought suppression, substance use, behavioural avoidance or more worry and rumination in an attempt to resolve conflict or distress. Even if these strategies are effective in the short term, they fail in the long term, which reinforces the uncontrollability and perceived dangerousness of repetitive thinking and thus maintains the CAS.

The distinguishing feature of MCT is that it targets the metacognitive level instead of the cognitive level. Rather than reality testing each specific negative automatic thought (e.g. *What is the probability of your child being harmed while walking to school?*), MCT aims to modify positive and negative metacognitive beliefs that are theorised to increase engagement in repetitive thinking on negative themes (e.g. *It seems that you believe that worrying about your child's safety is helpful in some way, perhaps as a way to prevent harm. What would happen if you decided to focus your attention on your work rather than your child's safety?*). In contrast to treating thoughts as facts (object mode), the metacognitive mode therefore treats thoughts as events in the mind. In this way, therapy aims to modify the beliefs that maintain focus on threatening cognitive content, rather than the specific thoughts themselves. One important advantage of this approach is that if the CAS maintains emotional disorder across anxiety and related disorders, then targeting transdiagnostic metacognitive processes should be effective at reducing symptoms of principal and comorbid disorders. Wells has described how metacognitive beliefs serve to maintain repetitive negative thinking, threat monitoring and anxiety symptoms in GAD, post-traumatic stress disorder and obsessive compulsive disorder, as well as depression symptoms in major depressive disorder [20]. Empirical evidence linking emotional disorders to elements of the CAS, including worry and rumination, attentional threat monitoring, maladaptive metacognitive-focused coping, metacognitive beliefs and the causal status of metacognition, have been reviewed in detail elsewhere [20, 22, 23••, 24•] and are beyond the scope of this review.

Metacognitive Therapy for Anxiety Disorders: Key Components and Outcomes

MCT aims to increase metacognitive awareness and challenge metacognitive beliefs via Socratic dialogue, and involves techniques designed to increase attentional flexibility and control so that key components of the CAS, including inflexible and excessive self-focused attention and repetitive thinking, can be interrupted [20]. The Attention Training Technique (ATT) involves three phases during which the client is encouraged to maintain attention on specific auditory stimuli in the close, middle and far distance (phase 1: selective attention), switch rapidly between the stimuli (phase 2: attention switching), and then increase breadth of attention on to all stimuli simultaneously (phase 3: divided attention). Situational attention refocusing is the application of new awareness and attentional control skills in real-world situations so that the individual can interrupt and redeploy self-focused attention back to the task at hand. Clients are instructed to gather specific information about aspects of the situation (e.g. what people were wearing, facial appearance of others) while completing brief exposure tasks. Afterwards, degree of external focus is assessed by asking the client to report recalled external details of the situation. Detached mindfulness is another technique designed to increase meta-awareness by separating the self from cognitive events. The mindfulness component of detached mindfulness refers to increasing awareness of, and flexible focus on, cognitive events and beliefs as they naturally occur. Detachment refers to an absence of cognitive (e.g., appraisals, further worry, suppression, threat monitoring) or behavioural (e.g., avoidance, escape) responses to internal events, with an understanding that the internal events can be observed in such a way that they are separate from the self.

Early evaluations of MCT used multiple case series designs for a range of clinical presentations. Rochat et al. recently meta-analysed 14 case series studies to investigate the effects of the ATT alone, and the whole MCT package, across multiple disorders including OCD, hypochondriasis, depression, paranoid schizophrenia, emotional distress (anxiety, depression, post-traumatic stress) and panic disorder [25•]. The rationale for investigating the efficacy of the ATT alone is that it targets a key component of the CAS, namely, excessive and inflexible self-focused attention. The ATT is also a simpler and briefer intervention than the full MCT package, so if they are equally effective then dissemination of ATT would be more cost-effective with respect to training and more efficient for therapists and clients. The total sample included 53 adult outpatients, with 10 receiving the ATT only. Overall, the effect sizes were large for anxiety ($d = 1.41$) and depression ($d = 1.20$), with larger changes being associated with more sessions, fewer female participants and less chronic symptoms. The type of intervention (ATT vs. MCT as a package) did not moderate outcomes, which the authors interpreted as evidence that the ATT alone and MCT are evidence-based interventions for emotional disorders.

Knowles and colleagues systematically reviewed 10 studies of the ATT as a standalone treatment in clinical and non-clinical samples (four single-case, two case study pre-to-post and four randomised controlled designs) [26•]. Similar to Rochat et al. [25•], Knowles et al. concluded that the case studies suggested that ATT is associated with large effects for panic disorder, hypochondriasis and unipolar depression, and reductions in beliefs and anxiety symptoms in social phobia. The controlled trials revealed an increase in external focus of attention following the ATT compared to mindfulness, with increased external focus being associated with less cognitive anxiety in the ATT group [27]. ATT was also associated with greater externally focused attention compared to relaxation training, along with reductions in hypervigilance to sensory pain words and higher pain threshold (but not in pain tolerance or ratings) [28]. Finally, ATT was associated with greater reductions in self-focused attention and analogue trauma intrusions, and larger increases in attentional flexibility, compared to a control group with an attentional filler task [29, 30]. These findings suggest that the ATT is associated with reduced self-focused attention, anxiety, hypervigilance to pain stimuli and cognitive intrusions. However, an important limitation of these studies is that they used unselected undergraduate or analogue samples. It is not clear how these effects would generalise to samples with elevated clinical symptoms or disorders. The authors also noted that two case studies provided preliminary evidence that the ATT may help to reduce auditory hallucinations and positive symptoms of schizophrenia, although further controlled studies are required.

Fergus and Bardeen comprehensively reviewed of the process of implementing ATT, commonalities and differences with related interventions, a review of evidence for efficacy, a description of limitations and potential mechanisms of change [23••]. The authors identified variation in the protocols (e.g. number and format of sessions), along with a limited number of controlled trials, as important limitations within the existing literature, and suggested that future studies provide the recommended number of sessions (daily over a 4-week period) and potentially use the automated version to ensure fidelity. Using Chambless and Hollon's criteria [31], the authors concluded that ATT could best be considered as *possibly* efficacious. Further randomised controlled trials (RCTs) are required that compare the ATT to alternative empirically supported treatments. Outcomes within transdiagnostic samples on symptoms of both principal and comorbid disorders are also important to assess.

Normann, van Emmerik and Morina reviewed controlled and uncontrolled trials of MCT for anxiety disorders and depression ($N = 16$ studies with ≥ 5 participants each) [32••]. Nine studies were controlled and seven were uncontrolled (four open trials, three case series). The study found a large within-group effect size (Hedge's $g = 2.00$), which maintained to follow-up ($g = 1.68$, mean 7.88 months, SD = 3.56), and large between group effect sizes compared to waitlist controls ($g = 1.81$) and CBT ($g = .97$). Effects also maintained to follow-up. Subgroup analyses found no differences in effects for controlled versus uncontrolled trials, or between anxiety and depression outcomes. Treatment was also associated with a large effect on metacognitive beliefs.

More recent studies not included in these reviews have evaluated MCT for social anxiety disorder using a case series design ($N = 3$) [33], MCT for OCD within an open trial ($N = 25$) [34], group MCT for primary and non-primary GAD ($N = 52$) [35, 36] and a case study for comorbid anxiety disorders ($N = 1$) [37]. Another study used a cross-over design with the ATT followed by Situational Attentional Refocusing, or vice versa, and found that 46% of participants with social anxiety disorder no longer met diagnostic criteria after the intervention ($N = 24$) [38]. Findings from these studies were consistent with the previous review papers, with large effect sizes demonstrated across research designs, disorders and treatment format (group, individual). The corpus of evidence to date therefore suggests that MCT impacts on the hypothesised mechanisms and is effective for anxiety (and related) disorders and depression.

Significant Developments

MCT for Children and Adolescents

One novel area of research has been MCT in children and adolescents. Children develop the capacity for metacognitive awareness by middle childhood, and they endorse

metacognitive beliefs, especially negative metabeliefs and in clinical samples [39, 40]. In children and adolescents, metacognitive beliefs are positively associated with anxiety symptoms [40–47] and parental psychological overcontrol (e.g. inducing guilt, withdrawing affection), and are negatively associated with autonomy-granting (e.g. encouraging children to contribute to decisions and problem-solving) [46]. Interestingly, mothers' metacognitive beliefs are moderately correlated with their children's metacognitive beliefs ($r = .66$, $p < .001$), anxiety ($r = .29$, $p = .002$) and worry ($r = .31$, $p = .0001$) [48]. Esbjørn et al. also found that child metacognitive beliefs statistically mediated the relationship between mothers' metacognitive beliefs and child anxiety and worry [48]. Although the findings were correlational and cross-sectional, and thus causal conclusions cannot be drawn, they are consistent with intergenerational transmission of metacognitive beliefs.

One of the first case studies in children demonstrated effectiveness of MCT for OCD in children aged between 8 and 17 ($N = 10$) [49]. Participants received up to 20 individual weekly sessions plus 3-month and 2-year follow-ups, with five being randomised to MCT and five to exposure and response prevention. MCT compared favourably with exposure and response prevention, with four out of the five patients receiving MCT and all five patients receiving exposure and response prevention recovering up to 2 years after treatment. Comorbid depression symptoms also reduced in both groups.

Esbjørn, Normann and Reinholdt-Dunne described developmentally appropriate adaptations to MCT for GAD, such as the inclusion of visual cues, worksheets, practical exercises within a group format and metaphors (e.g. trains as a metaphor for thoughts) to facilitate vicarious learning and promote metacognitive awareness [50••]. The protocol also involved a higher dose of in vivo practice with therapist guidance than the adult protocol, as well as the ATT, situational attentional refocusing, detached mindfulness, and challenging of negative (e.g. worry postponement to challenge uncontrollability beliefs) and positive (e.g. experiments testing the veracity of beliefs) metacognitive beliefs. The treatment was delivered across two individual family sessions, two parent group workshops and 10 child group sessions with one booster session. Four individual cases with principal diagnoses of GAD (11–12 year olds) were reported to have experienced symptom reductions from pre-post treatment across parent and child reports, and three children lost their anxiety diagnoses. The program was subsequently revised to remove the individual family sessions to reduce repetition, and the number of therapy sessions was reduced to eight, 2-h child group sessions plus one booster after 3–5 weeks, and two group parent sessions.

Esbjørn and colleagues recently published an open trial of their revised MCT protocol with children ($N = 44$) aged 7 to 13 years [51••]. Effect sizes on measures of worry and anxiety were large at post-treatment (ds = .98–1.29) and follow-up (ds = .90–1.28), with 70% and 77% achieving clinically significant change, respectively (i.e. reliable improvement and scores within the normative range). All MCQ subscales also significantly reduced from pre-post treatment, except for the positive metacognitions subscale. Positive metacognitive beliefs have also been found to change less than negative metacognitive beliefs in adults [36] and to be less strongly associated with worry in children and adolescents [40]. Attrition was also low (1 dropout), suggesting a high degree of acceptability [51••]. Interestingly, each group of five to six children included three or four therapists across the eight, weekly 2-h sessions plus a voluntary booster session. Such a large ratio of therapists to group participants reduces the potential cost-effectiveness of group interventions, although the researchers reported using groups to facilitate metacognitive awareness within the children [50••] rather than as a means to increase efficiency. Nonetheless, such a high number of clinicians may not be feasible in most treatment settings, which is an important consideration. It is unclear whether similar outcomes could be achieved with one or two therapists.

Thorslund, McEvoy and Anderson recently evaluated a MCT package in a case series of 10 adolescents with mixed anxiety and depressive disorders aged between 14 and 17 years [52]. The protocol involved six, 5-h sessions plus 1-month group follow-up session. Three-month follow-up data was also collected to assess maintenance of gains. Two groups with five participants each were completed with two therapists. Effect sizes to post-treatment, and 1- and 3-month follow-ups, were large for worry (ds = 1.23, 1.20, 1.53, respectively), and four (40%), six (60%) and seven (70%) patients lost all principal and comorbid diagnoses at post-treatment, 1-month follow-up, and 3-month follow-up, respectively. An additional patient lost two of his three diagnoses by the final follow-up. Larger trials comparing MCT to alternative treatments are now required in children and adolescents.

Comparisons to Alternative Treatments: Outcomes and Mechanisms

Recent studies have compared outcomes and mechanisms between MCT and alternative interventions in adults. Johnson and colleagues randomised 74 in-patients with post-traumatic stress disorder, social phobia, or panic disorder with or without agoraphobia to 8 weeks (mean = 9.4 sessions, SD = 1.7) of either MCT ($n = 36$) or CBT ($n = 38$) [53••]. MCT was associated with more rapid reductions in anxiety symptoms, depression symptoms, worry and general symptoms from pre- to post-treatment, but the CBT group continued to improve such that there was no difference at 1-year follow-up, with 45% and 50% of patients in MCT and CBT, respectively, reliably improving or recovering. The transdiagnostic aspect of this trial is particularly important, given that this approach has the potential to reduce training and assessment demands and

may more efficiently target both principal and comorbid disorders [19].

Hoffart and colleagues followed up this study by investigating mechanisms of change and found a significant time by treatment interaction on a measure of the CAS, with larger changes during MCT than CBT on negative and positive metacognitive beliefs [54••]. Interestingly, changes in positive metacognitive beliefs predicted variance in subsequent anxiety in both treatments, and avoidance and unhelpful self-control strategies reduced in both treatments, suggesting shared mechanisms of change. Another evaluation of the same study reported that metacognitions changed more in MCT than CBT, but negative automatic thoughts reduced equally across treatments [55••]. Interestingly, within-person changes in cognitions and metacognitions were associated with symptom change cross both treatments, so the study was unable to clearly demonstrate that MCT and CBT operate via different mechanisms.

Capobianco and colleagues compared 8 weeks of group MCT to mindfulness meditation in a sample recruited from mental health and university counselling service waitlists with elevated anxiety and/or depression symptoms ($N = 35$) [56••]. A small effect favouring MCT was found for symptoms of depression and anxiety between pre- and post-treatment ($d = .21$, $p = .04$) but not at 6-month follow-up ($d = .09$, $p = .14$). At post-treatment, more than twice the proportion of patients had reliably improved (6+ point change on the Hospital Anxiety and Depression Scale) following MCT (65%) compared to mindfulness meditation (28%, $p = .003$), but the difference was no longer significant at follow-up (71% vs. 50%, $p = .21$). Interestingly, however, MCT was associated with significantly larger reductions in positive and negative metacognitive beliefs, which was consistent with the metacognitive model and indicates that unique mechanisms of change were likely to have operated between the two interventions. Overall, there appears to be some emerging evidence that MCT is associated with more rapid and potentially larger changes in anxiety and depression symptoms compared to CBT and MBSR, although there is less evidence for longer-term superiority of MCT.

Controversies

An important issue in the field of psychotherapy is how alternative treatment approaches differ in terms of theoretical mechanisms, language, techniques and outcomes. Some theorists emphasise the significant commonalities across theories and treatments [57, 58], whereas others emphasise the apparent differences [59]. Psychotherapists cannot operate with the precision of a surgeon who ablates a discrete piece of tissue, or of a vaccination that prevents illness from a specific strain of disease. Any psychotherapeutic technique that alters a particular (meta)belief or behaviour will inevitably impact on not only the declarative beliefs (cognitive and metacognitive), but also underlying processes (attention, interpretation, memory), behaviour and affect. Although developing alternative therapies increases the armament available to therapists, potentially assisting with treatment matching, it has been argued that there is much to be gained by identifying common mechanisms across treatments [58, 60•].

Evidence that ATT and MCT have similar impacts on symptoms and mechanisms to mindfulness approaches [60•] and CBT [53••, 61], or that adding ATT to CBT does not yield additive benefits [62], suggest that different techniques within these therapies may either be operating either directly or indirectly on the same mechanisms. Mindfulness has been distinguished from 'detached mindfulness' in MCT, with the former being criticised as being atheoretical and less specific [20, 56••]. It will be important for future research to identify demonstrable, reliable differences between the mechanisms targeted by different interventions so that the proposed unique contribution of MCT mechanisms and techniques can be verified. It is noteworthy that MCT has been found to be more effective at modifying mechanisms described in alternative models. For example, van der Heiden et al. found that MCT was associated with larger changes in intolerance of uncertainty than a treatment specifically targeting intolerance of uncertainty [63]. Furthermore, components of metacognitive theory are shared with other theories, including positive beliefs about worry which is a central component of the avoidance model of GAD [64, 65]. These issues indicate that comparative studies that investigate not only outcomes but also common and unique mechanisms of change may help to increase theoretical and clinical parsimony.

Future Research Directions

A large body of evidence suggests that MCT is effective for anxiety and related disorders, and there is emerging evidence for other disorders and clinical problems, but much work is still to be done. There are at least eight important areas for future research in MCT. First, although early evidence suggests that MCT is effective in children and adolescents, it is important that these findings are replicated and that MCT is compared to other evidence-based treatments within these age groups. Further work on how best to adapt materials for different developmental stages is also required. Second, it would be valuable for future trials to repeatedly assess outcomes and mechanisms of change throughout treatment to establish temporal precedence of change in mechanism measures, identify the timing of direct and indirect mechanisms of change, and to determine the unique and common mechanisms across different forms of therapy. The

identification of universal mechanisms, which effect change across disorders and therapies, will help to increase therapeutic efficiency and parsimony [57]. Third, novel methods of treatment delivery that have the potential to increase access to MCT should be investigated. Internet-based CBT is now well-established as an effective and efficient mode of delivery for a range of anxiety disorders [66], so this should be tested for MCT. Fourth, MCT is purported to be a transdiagnostic intervention, but it remains unknown whether disorder-specific MCT targeting the principal or most severe disorder, or transdiagnostic MCT applied across disorders, would have equivalent effects on symptoms of principal and comorbid disorders.

Fifth, MCT should be compared to additional evidence-supported treatments and applied to a broader array of clinical problems. For example, an intriguing study is underway to compare MCT to eye movement desensitisation and reprocessing (EMDR) for PTSD [67], and others are investigating whether group MCT [68] and home-based self-help [69] alleviate anxiety and depression symptoms in cardiac rehabilitation patients. Sixth, dismantling studies that investigate individual components of MCT and other treatments will also be informative for identifying the most potent and unique aspects of MCT. One study compared a single session of ATT to mindfulness in high-trait anxious individuals in terms of impacts on state anxiety and four mechanisms, namely, distancing, present-focused attention, uncontrollability and dangerousness metacognitive beliefs, and cognitive flexibility [60•]. This study found virtually identical impacts on state anxiety and all mechanisms across both interventions compared to 'thought wandering' controls. These findings suggest that these different techniques deriving from different theoretical frameworks might operate on common mechanisms. It is important to note that this study compared only one technique from each therapy rather than full MCT or mindfulness interventions, but it does suggest that individual techniques within different therapies potentially operate on largely common mechanisms. Future research investigating these mechanisms across full treatments will be informative. Seventh, it is unknown whether individual MCT is equally effective to group MCT, although benchmarking studies have failed to find substantial differences [35]. Group interventions require fewer therapist hours so may increase cost-effectiveness if similar outcomes can be achieved. Eighth, to date, most studies have been preliminary evaluations of average changes on purported mechanisms and symptom measures, many with small sample sizes. Larger studies will enable investigations of individual difference variables that moderate treatment outcomes (e.g. demographics, principal disorder, comorbidities, temperamental factors, cognitive factors), which will help to identify prognostic factors and facilitate future treatment matching.

Conclusions

This review provides an update on the current status of MCT for anxiety and related disorders. Evidence for the efficacy and effectiveness of the ATT and MCT is accumulating, and it appears that large effects can be achieved for anxiety and related disorders. Recent innovations include applications to children and adolescents, applications to a broader range of clinical problems, comparisons to alternative treatments and investigations of mechanisms of change. Future work in these areas will continue to increase our understanding of the common, unique and most critical change processes facilitated by MCT compared to other interventions.

Compliance with Ethical Standards

Conflict of Interest The author declares that there are no conflicts of interest.

Human and Animal Rights and Informed Consent This article does not contain any studies with human or animal subjects performed by any of the authors.

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