Metacognitive Beliefs in Post Traumatic Stress Disorder

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Over 80% of people in the United States have been exposed to a traumatic event (e.g., interpersonal violence, physical injury, fear of being killed) at some point in their lives (Kilpatrick et al., 2013). While the majority of people will demonstrate an astonishing capacity to recover and continue to live normal lives, some will struggle to cope and may even develop a psychopathological response to trauma known as post-traumatic stress disorder (PTSD). PTSD is a psychiatric disorder that according to the Diagnostic and Statistical Manual of Mental Disorders (DSM-5; American Psychiatric Association, 2013) consists of four distinct symptom clusters. These include re-experiencing (e.g., intrusive memories or flashbacks about the event), avoidance (e.g., avoiding any reminders of the traumatic event), negative cognitions and mood (e.g., persistent negative and distorted beliefs about the event, such as believing it was one's fault) and arousal (e.g., constantly feeling on edge and alert to threat). The DSM-5 states that these symptoms have to persist for over one month for an individual to be diagnosed with PTSD.

Why are some people more resilient than others after experiencing a traumatic event? This question has sparked much research interest. Psychological resilience seems to involve the interplay of a multitude of biological, psychological and environmental factors. What is more, there is evidence that people may be able to hone their psychological skills to enhance resilience. For instance, research thus far has identified key psychological factors, which, when strengthened, boost resilience. These factors include having adequate social support, having a tendency towards positive self-efficacy (i.e., believing that one has the capability to succeed; see Bandura, 1977) and certain cognitive factors, such as having a positive appraisal style (i.e., a positive evaluation and interpretation of a situation). Should these factors take on the wrong form—such as having poor social support, low self-efficacy, or a negative appraisal style—people will tend to not cope as well following exposure to a stressful event. One important area of research that may help us to understand how to boost resilience and protect against the development of PTSD is the study of *metacognition*, and the related study of *metamemory*.

Metacognition is broadly defined as beliefs about one's own cognition, and it is involved in the monitoring, control and appraisal (i.e., the interpretation) of one's own thoughts. Metacognition serves as an internal guide that allows people to recognise their own thoughts, helping to allow them to take action. Everyday examples of metacognition include awareness that you have forgotten the name of the person you have just met, or realising that you need to refocus your attention because your mind has been wandering as you have been reading this paragraph. Metacognition plays a role in all aspects of our lives; therefore, perhaps unsurprisingly, it has been implicated in the development of psychological disorders. Metacognition can either be helpful or a hindrance when people try to recover after suffering a traumatic event. For instance, believing that worrying is helpful (*Worrying helps me cope . . . I must worry in order to be prepared*) or believing that holding negative beliefs about thoughts is dangerous (*My worrying is dangerous for me . . . When I start worrying I cannot stop*) are examples of maladaptive metacognition that can negatively impact a person's appraisal style and ability to cope (Wells & Cartwright–Hatton, 2004). Metamemory is a type of metacognition that refers to the processes whereby people are able to examine the content of their memories, both prospectively and retrospectively, and make judgements about them. Thus, metamemory does not refer to memory itself, but rather it is the *judgements* and *assessments* that we make about our own memories. For instance, although evidence for the experience of disorganised memory in PTSD is inconsistent (due in part to difficulties in operationally defining and measuring these types of memories), simply believing or perceiving one's memory to be disorganised can be problematic (e.g., Bennett & Wells, 2010; Segovia, Strange & Takarangi, 2015).

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The metacognitive model (Wells, 2000; Wells & Sembi, 2004) proposes that metacognitions play an integral role in the development of PTSD. According to this model, immediately after a traumatic event, symptoms, including memory intrusions, increased arousal (e.g., heart racing, sweating, rapid breathing) and startle responses, emerge. The model suggests that these symptoms are a sign that an individual is attempting to emotionally process the trauma and adjust in a way that promotes future coping. These symptoms are all *normal* responses that stem from an in-built reflexive adaptation process (RAP). The goal of the RAP is to develop new procedures (metacognitions) for controlling cognition and to develop plans for dealing with any future threats. For most people, this process continues uninterrupted, and symptoms tend to naturally subside. However, for some people, these symptoms persist and can lead to PTSD. According to the metacognitive model, psychological disorders are caused by an extended pattern of thinking that is known as cognitive attentional syndrome (CAS). The CAS consists of three processes: worry and rumination, threat monitoring, and (poor) coping strategies. The CAS maintains symptoms and prevents cognition from re-tuning to the normal, threat-free mode of processing. The CAS is driven by both positive and negative metacognitive beliefs. Positive metacognitive beliefs are those beliefs that are perceived to have positive effect on coping, such as worrying about possible future threats (e.g., *If I worry, bad things will not happen*), rumination (e.g., *I must go over the event to make sense of it*), and dwelling on memory and filling in any memory gaps (e.g., *I must have a complete memory to feel normal*). Negative metacognitive beliefs concern the uncontrollability and negative evaluation of thoughts (e.g., *My worrying is uncontrollable*). These types of beliefs, alongside the persistent use of maladaptive thought control strategies, represent an attempt to regulate emotion; instead, however, they serve to maintain a sense of threat and lead to persistence in PTSD symptoms according to the metacognitive model.

The metacognitive model of PTSD—in particular, the role of worry and rumination in PTSD—is continuing to gather support. For instance, Roussis and Wells (2006) found that PTSD sufferers who endorse maladaptive beliefs post-trauma (e.g., positive beliefs about worry) exhibit greater stress symptoms. Consistent with the predictions of the metacognitive model, the use of worry as a way to control thoughts was positively associated with stress symptoms. The use of worry as a coping strategy

is thought to obstruct the RAP, causing the persistence of symptoms, although, as of yet, there is no direct evidence regarding the role of the RAP in the development and maintenance of PTSD. Therefore, the RAP and its link to PTSD remains a tentative idea.

Nevertheless, a growing number of studies support the role of metacognitive beliefs in psychological disorders, including PTSD. For example, a longitudinal study reported that rumination following exposure to a stressful life event was associated with increased levels of subsequent stress and depression (Nolen–Hoeksema, 2000). Additionally, Bennett and Wells (2010) found that metacognitive beliefs about the trauma predicted PTSD symptoms. For example, positive (e.g., *I need to have a complete memory for what happened so that I can learn from the event*) and negative (e.g., *Gaps in my memory are preventing me from getting over it*) metamemory beliefs, negative beliefs about the uncontrollability of thoughts and danger, beliefs about the need to control thought, and rumination were all significantly associated with PTSD symptoms. These findings are in line with the metacognitive model of PTSD, suggesting that maladaptive metacognitions and rumination as a thought control strategy disrupt the natural recovery process. Taken together, these studies highlight the promising role played by metacognitive beliefs in the development of PTSD.

Yet, little research has examined the role of metacognitive and metamemory beliefs in predicting the development of PTSD following trauma exposure. These issues hold great clinical significance because, through early intervention, these maladaptive beliefs could be targeted (via training and psychoeducation), leading to increased psychological resilience. For example, occupational groups frequently exposed to high levels of trauma (such as military personnel and first responders) could benefit from such support.

Takarangi, Smith, Strange, and Flowe (2017) recently examined the role of metacognitive beliefs in both the *onset* and *maintenance* of PTSD. They had three aims. First, they examined the cross-sectional relationship between a range of cognitive (e.g., trauma-related appraisals) and metacognitive beliefs and PTSD reactions. Second, they determined whether dysfunctional cognitive and metacognitive beliefs pre-trauma later predicted PTSD symptoms post-trauma and, lastly, they examined whether metacognitive beliefs predicted the maintenance of PTSD symptoms over time. This study involved measuring participants' trauma-related cognition, metacognition and PTSD symptoms at two time points (T1 and T2). These time points were spaced 12 weeks apart to try and capture a real traumatic life event. Indeed, about a third of participants reported experiencing such an event within this time frame. Participants were a nonclinical, adult population and were recruited via Amazon Mechanical Turk (an online participant recruitment platform), students at an Australian university and from the community through social media advertisement. In total, 664 participants took part in the study and the majority resided in the USA (n = 518), while others resided in Australia, Canada, New Zealand and the United Kingdom.

All participants received the same self-report measures at both T1 and T2. These included measurements of clinical symptoms (e.g., anxiety, depression and PTSD), trauma-related cognitions (e.g., *I can't rely on myself*), metacognitive beliefs (e.g., *Worrying helps me cope*), negative inferences about the meaning of intrusive memories (e.g., *My life is ruined*) and metamemory beliefs (e.g., *I must try to remember all of the details of the event so that I can understand why it happened*). Additionally, participants' lifetime exposure to potentially traumatic events (e.g., physical assault, sexual assault) was measured at T1. Then, at T2, they were asked to indicate whether they had experienced any of these events since T1 (i.e., within the 12-week time frame between T1 and T2).

The metacognitive model of PTSD suggests that maladaptive metacognitions, and rumination as a thought control strategy, disrupts the natural recovery process.

Takarangi et al. (2017) found that after controlling for a range of factors such as gender, age at the time of trauma, depression, and pre-existing cognitive beliefs (e.g., "*I am a weak person*), metacognitive beliefs alone were still independently associated with PTSD symptoms. Next, the researchers analysed whether pre-existing metacognitive beliefs at T1 increased PTSD symptomology following a novel traumatic experience at T2. The analysis included only those participants who endorsed experiencing a novel trauma between T1 and T2. The results showed that metacognitive beliefs, particularly pre-existing beliefs concerning the uncontrollability/danger of thoughts (e.g., *My worrying thoughts persist, no matter how I try to stop them*) and negative inferences about intrusions (e.g., *My life is ruined*) at T1, independently predicted PTSD symptoms following a novel traumatic event at T2. Additionally, people pre-

trauma who believed that the world is more safe and predictable, and did not believe they had to control their thoughts, were more likely to report PTSD symptoms. These findings indicate that holding such maladaptive beliefs directly increases a person's risk of developing PTSD. Lastly, in order to determine whether metacognition predicted the maintenance of PTSD symptoms over time, researchers only compared participants whose PTSD symptoms had remained elevated from T1 to T2 versus abated between T1 and T2. They found that maladaptive metacognition successfully predicted the majority of cases. Further, it was the negative metamemory beliefs (*Gaps in my memory are preventing me from getting over it*) and the negative inferences about the meaning of intrusions (*My life is ruined*) that were significant predictors of persistent PTSD. This result tells us that specifically holding these types of beliefs can further prolong PTSD. It also shows that negative inferences regarding intrusions not only predict PTSD but can also maintain PTSD symptoms. Overall, these findings are in line with previous research highlighting the influential role of metacognition within PTSD and provide an avenue for further research to better tackle such detrimental thinking.

The results of this study also have important clinical implications for PTSD sufferers and people who are at high risk of trauma exposure (e.g., military personnel, first responders). First, the types of metacognitive factors that could be targeted in psychological treatment following a traumatic experience have been identified—for instance, negative beliefs about memory (e.g., fragmented memory indicates something bad or abnormal) predicted PTSD symptomology, as did negative inferences about memory experiences (e.g., what it means to experience a memory intrusion). This knowledge can aid clinicians in targeting specific cognitions and beliefs about memory that predict and maintain PTSD in order to promote recovery. Second, the findings suggest that psychoeducational programmes that teach people how memory works (e.g., that a feeling of memory disorganisation following a distressing event is normal) and about the role of metamemory in PTSD (e.g., ruminating on

what it means to have a complete memory is detrimental to recovery) are important in building psychological resilience. The general population may not understand the complex nature of memory, especially memory for emotionally charged traumatic events. Therefore, developing psychoeducational resources about traumatic memory may reduce inaccurate and maladaptive beliefs that predict the occurrence and maintenance of PTSD. Lastly, maladaptive beliefs about memory may be targeted via *cognitive bias modification* (CBM) training. CBM training encompasses a series of techniques currently used to help alleviate anxiety and/or depression. The training is based on the idea that anxiety and depression emanate from biases in attention and interpretation. For example, there is robust evidence demonstrating both that anxious people tend to orient their attention to threat-relevant information in their environment and that anxious people tend to interpret ambiguous cues in a negative manner (see Beard, 2011 for a review). For example, negative interpretations of intrusive thoughts at baseline (e.g., thoughts that you are going mad) predict PTSD symptom severity at follow-up in both children (e.g., Ehlers, Mayou, & Bryant, 2003) and adults (e.g., Mayou, Ehlers, & Bryant, 2002). CBM involves systematically training people to reverse these biases and adopt new thinking patterns and beliefs. In one empirical example, Woud, Holmes, Postma, Dalgleish, and Mackintosh (2012) trained people to adopt positive or negative self-efficacy beliefs (e.g., *Somehow, since going through the whole experience, I feel that something inside me has grown/died*) following exposure to an analogue trauma event. The training involved presenting people with a series of scripted vignettes, which appear as a sentence completion task. Each sentence ended in a to-be-completed word fragment, such that the sentence remained ambiguous until the final word fragment was complete. For instance, people receive training sentences ending in a to-be-completed word fragment such as *Somehow, since going through the whole experience, I feel that something inside me has g _ o w n / d i _ d* (resolved as *grown* in the positive condition and *died* in the negative condition). This training is found to guide people to adopt either a positive appraisal style (an adaptive strategy) or a negative appraisal (a maladaptive strategy). Furthermore, people who received positive training reported fewer analogue PTSD symptoms (e.g., intrusions) compared to people who were in a negative self-efficacy training condition. Thus, CBM training could help form preventative strategies aimed to better educate and train people to think differently about memory, and reduce their vulnerability to PTSD should they experience trauma.

The findings suggest that psychoeducational programmes that teach people how memory works and about the role of metamemory in PTSD are important in building psychological resilience.

Taken together, Takarangi et al.'s (2017) study stresses that metacognition plays an important, active role in PTSD. It also extends past research by recognising the role of maladaptive metacognitive beliefs in both the onset and maintenance of PTSD, as well as identifying which metacognitive beliefs are most influential. These results hold exciting opportunities for further research into an array of interventions that can be tailored and developed to help target such maladaptive beliefs. Ultimately, this study will help shape preventative interventions for PTSD by fostering psychological resilience among those who are affected by trauma.

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