Threat-Related Attention Bias in the Early Stages of Cognitive-Behavior Therapy Action for Panic Disorder

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Cognitive theories of anxiety propose that information-processing biases play a pivotal role in the etiology and maintenance of anxiety disorders (1). Along with the application of conditioning principles derived from learning theories, such cognitive models inspired the development of cognitive-behavioral therapy (CBT), now considered the first-line treatment for anxiety disorders (2,3). But although extensive evidence indicates that automatic attention is biased toward threatening information in anxious individuals (4), such threat-related attention biases were typically thought to be outside the realm of the direct therapeutic effects of CBT, which focuses primarily on the modification of thoughts, interpretations, and beliefs (3).

Although CBT is highly effective in reducing anxiety symptoms, the exact processes and dynamics underlying its therapeutic effect are still not fully understood. In particular, it is not clear whether low-level, automatic processes are indeed not directly engaged by CBT. Complex interactions between different levels of cognitive processing impose further difficulties on outlining the mechanisms of CBT action. For example, it has been shown that training individuals to attend toward threat led to increased interpretation of ambiguous information as threatening (5). Conversely, another study (6) demonstrated that inducing change in the interpretation of ambiguous information affected attentional threat bias. Taken together, such findings suggest that anxiety symptoms may potentially be reduced via different and interacting cognitive processes and pathways. Mapping the interplay between the different mechanisms mediating symptom reduction has substantial implications for the understanding of CBT as well as for the development and refinement of novel treatment approaches.

In the current issue of Biological Psychiatry, Reinecke et al. (7) examine the role of threat-related attention bias in the early stages of CBT action, testing the possibility that CBT rapidly affects automatic emotional information processing, before later symptom reduction is reported. Twenty-eight panic disorder patients participated in the study, which took place on 2 consecutive days and a follow-up 4 weeks later. On each of the study days, patients completed self-report questionnaires of panic-related cognitions assessing explicit catastrophic beliefs, fear of physical symptoms, and severity of agoraphobic beliefs. On each day, patients also reported stress reactivity to a 5-minute, panic-inducing situation tailored to each participant’s individual panic trigger (stress test). At the end of the first day, patients were randomized to receive either a single-session CBT intervention (treatment group) or no intervention (control group). The intervention included a brief explanation of the cognitive mechanisms associated with panic disorder and its treatment and a 15-minute exposure to a panic-inducing situation while dropping safety behavior. Attention bias to emotion faces (happy and fearful) was measured once on the day following the intervention.

Results indicated that the treatment and control groups did not differ in self-reported panic cognitions at baseline (first day, prior to intervention). On the following day, after half of the patients received the CBT session, the two groups still did not differ in panic cognitions, and a significant attentional bias toward masked fearful faces was found in the control group. At the 4-week follow-up, the treatment group reported lower fear of physical symptoms and lower severity of agoraphobic beliefs relative to controls. Finally, in the treatment group, fear bias correlated with a reduction in agoraphobic beliefs from baseline to follow-up.

The present results provide potentially important insights into the therapeutic effect of CBT and the role that threat-related attention bias plays in it. Because group differences in threat bias were evident one day following the intervention and before any reported change in panic cognitions, the authors concluded that CBT may affect low-level processes earlier in treatment than previously anticipated. The authors further suggested that changes in threat-related attention processes may mediate symptom reduction. These notions are intriguing because they challenge the traditional view that the focal mechanism of action in CBT is the engagement and modulation of conscious and deliberate cognitive control processes over time and repeated exposure (8). Instead, it is suggested that CBT triggers immediate changes in threat-related attention, which then cascade upstream and lead to symptom reduction. Substantial support for a mediating role of attention bias in the treatment of anxiety comes from attention bias modification (ABM) studies, in which patients are trained to direct their attention away from threat cues. Randomized controlled trials have demonstrated that ABM can lead to a reduction in anxiety symptoms (9). If CBT efficacy indeed depends, at least in part, on changes in threat bias, it would be interesting to explore the interplay between CBT and ABM in the context of treatment efficacy.

Several strengths of this study should be noted. First, the incorporation of an attention bias measurement within the course of treatment presents a powerful methodology potentially allowing disentangling the contribution of different cognitive processes to therapeutic effects. Second, introducing such measurements early in treatment may help identify possible markers for treatment response and efficacy. Finally, the use of a single-session, acute-dose CBT intervention was sufficient to initiate a therapeutic effect. Such methodology may serve as a useful and economical model for future investigations of CBT as well as other treatment action.

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Naturally, the current study raises many questions, which future research using this theoretical framework could take into consideration. For instance, in the present study, threat bias was not measured before treatment. Thus, the reported group differences in threat bias after treatment cannot be taken to reflect actual changes in bias scores because of the intervention. It is possible that these group differences already existed before the intervention. For this reason, caution may also be warranted when attributing a mediating role to threat bias in symptom reduction. Future studies exploring the model of therapeutic effect proposed in this work may therefore benefit from repeated measurements of all the implicated processes at all relevant time points. Other potential questions arise concerning the inferences that can be drawn from the results of the stress tests. These results indicate that although symptomatic reactivity to the stress test did not differ between the groups before treatment, patients receiving the CBT session reported significantly lower reactivity than the control patients as early as the day following the intervention. Considering this, the results may therefore suggest that at least some reduction in panic symptoms occurred immediately following the intervention and concurrently with the suggested changes in threat bias. If so, an important question to explore is whether some panic symptoms are alleviated early in CBT action regardless of changes in attention, whereas other symptoms are affected via slower, automatic attention-dependent processes.

The general conceptualization of rapid versus more slowly evolving cognitive effects in psycho- and pharmacotherapy is highly important because it could lead to improved treatments in both areas (10). Demonstrating rapid effects also has important implications for the understanding of the active ingredients in anxiety and mood disorders. The findings reported by Reinecke et al. (7) highlight both the potential and the complexity associated with such systematic exploration of treatment mechanisms.

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