



## Testing a procedural variant of written imaginal exposure for generalized anxiety disorder



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### ABSTRACT

This experiment examined the degree to which it is more beneficial for individuals with generalized anxiety disorder (GAD) to engage in repeated exposure to mental imagery of the same feared scenario versus varying the exposure content. On three consecutive days, individuals with GAD ( $N=57$ ) spent 20 min writing about: (1) the same worst case scenario (consistent exposure; CE), (2) variations of their worst case scenario (varied exposure; VE), or (3) a neutral topic (neutral control; NC). Participants in the CE condition displayed significant decreases in worry, acute cognitive avoidance, and intolerance of uncertainty from baseline to 1-week follow-up; participants in the VE and NC conditions did not. Initial activation of self-reported anxiety (observed in the CE and VE conditions) and between-session reduction in anxiety (observed in the CE condition only) were associated with improvement in worry. Including more references to negative emotion and writing in the present tense were also associated with greater improvement in worry in the CE condition. These findings suggest that writing repeatedly about the same worst case scenario may benefit people with GAD. The study also provides information on potential mechanisms of change.

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According to the most recent editions of the Diagnostic and Statistical Manual of Mental Disorders (American Psychiatric Association, 2000, 2013), generalized anxiety disorder (GAD) is a common and debilitating disorder marked by excessive and uncontrollable worry and anxiety. Borkovec and colleagues suggested that individuals with GAD engage in cognitive avoidance strategies to dampen mental images of feared scenarios and the anxious arousal brought on by these images (Sibrava & Borkovec, 2006; Stöber & Borkovec, 2002). Stöber (1998, 2000) proposed that individuals with GAD achieve this dampening effect by thinking about feared scenarios in an abstract manner, since abstract thinking produces mental images that are less vivid and emotionally-evocative than concrete thinking (Paivio & Marschark, 1991). As a consequence, however, abstract thinking may prevent the “emotional processing” of fears (Sibrava & Borkovec, 2006; Stöber, 1998, 2000; Stöber & Borkovec, 2002).

Emotional processing theory (EPT; Foa & Kozak, 1986; update, Foa, Huppert, & Cahill, 2006) explains that for “emotional

processing” to occur, a person must engage in repeated, systematic exposure to the object or situation that he or she is avoiding. During this exposure the full “fear structure” encompassing stimulus, response and meaning elements, must be activated. Anxious arousal during the first exposure session is taken as an indicator of such activation. In addition, new information that is incompatible with the fear structure must be integrated into it, which is thought to be shown by a reduction in anxious arousal across exposure sessions.<sup>1</sup> Because abstract thinking dulls mental imagery, and consequently, emotional arousal, it may prevent the complete activation of fear structures and impede emotional processing (see Sibrava & Borkovec, 2006).

If avoidance of threatening mental images plays a role in maintaining chronic worry, then confronting these images and the anxious arousal that they evoke may be helpful to individuals with GAD, as it may promote emotional processing (van der Heider & ten Broeke, 2009; Zinbarg, Craske, & Barlow, 2006). In many anxiety disorders, the feared stimuli are tangible objects or situations

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<sup>1</sup> Within-session anxiety reduction was also initially proposed as an indicator of emotional processing (Foa and Kozak, 1986); however, it currently is not considered to be an indicator of emotional processing, as it has not been consistently linked to symptom improvement (see Foa et al., 2006).

(e.g., snakes, driving) that can be approached in vivo. However, according to Stöber and Borkovec (2002), for people with GAD the feared stimuli are mental images of hypothetical worst case scenarios (WCSs) and the anxious arousal associated with these images. Based on this, exposure for GAD involves recounting the WCS coming true in as much emotional detail as possible, in the first person, and in the present tense (see Dugas & Robichaud, 2007; Rygh & Sanderson, 2004), which is thought to help concretize feared mental images and promote a sense of actually being in the situation.

## 1. Previous research on imaginal exposure for GAD

Although imaginal exposure is included in some evidence-based cognitive-behavioral therapies (CBT) for GAD (Dugas & Robichaud, 2007; Zinbarg et al., 2006), only a few studies have examined imaginal exposure independently of other CBT techniques, and the methods used in these studies have varied considerably. Provencher, Dugas, and Ladouceur (2004) used a case replication design to investigate the effects of twelve 1-hour therapy sessions of imaginal exposure or problem solving in a GAD sample. Provencher et al. found that both techniques led to large improvements in worry and GAD-associated symptoms from baseline to posttreatment ( $d_s = 1.42$ – $1.63$ ). Goldman, Dugas, Sexton, and Gervais (2007) compared the impact of five 30-minute sessions of written imaginal exposure to five 30-minute sessions of neutral writing in a sample of high worriers. They found that participants who engaged in imaginal exposure showed significant, large improvement in worry from baseline to 2-week follow-up ( $d = 1.22$ ), whereas participants who engaged in neutral writing did not ( $d = .45$ ). They also found that participants in the imaginal exposure and neutral writing conditions both showed significant, large improvements in GAD-associated symptoms over time ( $d_s = 1.14$  and  $.80$ , respectively). There were no significant between-group differences at 2-week follow-up on either worry ( $d = .40$ ) or GAD-associated symptoms ( $d = .22$ ). In addition, Goldman et al. found that intolerance of uncertainty (IU) scores at one time point predicted levels of GAD symptoms at a subsequent time point in their imaginal exposure condition. Finally, Hoyer and colleagues (2009) conducted a randomized controlled trial comparing the impact of fifteen 1-hour sessions of worry exposure (i.e., evoking and holding in mind a mental image of a feared scenario) or applied relaxation to a waitlist condition in a GAD sample. Hoyer et al. found that worry exposure and applied relaxation both led to significant improvements in worry, anxiety, negative beliefs about worry, and the tendency to suppress thoughts compared to the waitlist condition. These effects ranged from small to large in the imaginal exposure condition ( $d_s = .27$ – $.89$ ), and medium to large in the applied relaxation condition ( $d_s = .78$ – $.97$ ); however, there were no significant differences between the treatment conditions on outcomes at post-treatment.

Overall, the limited evidence suggests that the delivery of imaginal exposure modifies GAD symptoms as well as underpinning processes. However, there are a number of important questions that still need to be addressed regarding the effects of exposure. Specifically, there is much to be learned about the procedure itself. There have been many investigations of the optimal parameters of exposure for other anxiety disorders (e.g., Abramowitz, Foa, & Franklin, 2003; Chambless, 1990); however such studies are lacking in GAD. Studies comparing different exposure procedures for GAD are important to the development of empirically-based guidelines for conducting exposure in practice, and having such guidelines may ultimately improve the therapeutic value of exposure.

## 2. The present study

The present study sought to extend what is known about exposure for GAD by comparing the effects of repeated imaginal exposure to the same WCS (consistent exposure) to the effects of exposure to different WCSs (varied exposure). Past research with individuals with specific phobias has suggested some benefit to varying the exposure stimulus (Lang & Craske, 2000; Rowe & Craske, 1998), as this ought to result in greater generalization of learning from the exposure context to “real life” encounters with the feared stimulus (Schmidt & Bjork, 1992). In contrast, a study with people who had experienced multiple traumas found that consistent exposure to the same trauma memory on each of 3 days was more beneficial in reducing posttraumatic stress disorder (PTSD) symptoms than was exposure to a different trauma memory on each of 3 days, which was no more helpful than reflecting on nonemotional events (Sloan, Marx, & Epstein, 2005). This suggests that under certain circumstances, *not* varying the exposure content may be most beneficial. It is possible that the benefits of varied exposure may depend on the type of stimulus that one is being exposed to (e.g., an animal versus a complex mental image).

People with GAD, by definition, have concerns that traverse several domains (e.g., Dugas, Freeston, et al., 1998). Further, they typically have multiple worries within the same domain (e.g., many worries related to work). Thus, there are many possible exposure stimuli. The first aim of the present study was to investigate whether consistent or varied imaginal exposure would be most beneficial in reducing GAD symptoms. It was hypothesized that individuals who engaged in consistent or varied exposure would report greater improvement in GAD symptoms from baseline to 1-week follow-up compared to individuals who engaged in neutral writing. Given that previous findings on the relative advantage of consistent versus varied exposure have been mixed, it was possible that either could facilitate greater improvement in GAD symptoms, thus no specific hypotheses were offered.

The second objective of the present study was to examine the effect of exposure on two processes involved in GAD – cognitive avoidance and IU (Dugas, Freeston, et al., 1998; Dugas, Gagnon, Ladouceur, & Freeston, 1998; Sibrava & Borkovec, 2006). Theoretical writings and past research suggest that these processes should improve with imaginal exposure to threatening mental images (Dugas & Robichaud, 2007; Goldman et al., 2007; van der Heider and ten Broeke, 2009). It was predicted that from baseline to 1-week follow-up, individuals assigned to either consistent or varied exposure would display a significant improvement in: the habitual tendency to engage in cognitive avoidance (from here on, chronic cognitive avoidance), fear and avoidance of an idiographic mental image of the WCS (from here on, acute cognitive avoidance), and IU, relative to individuals assigned to the neutral writing condition. No hypotheses were advanced regarding differences between the exposure conditions, given the mixed findings described earlier.

The third goal of the present study was to test the notion that the activation of anxious arousal in the first exposure session and a reduction in anxious arousal across exposure sessions predict outcomes following exposure. To our knowledge, these core tenets of EPT as applied to exposure for GAD have not yet been tested. It was hypothesized that relative to participants in the neutral writing condition, participants in the exposure conditions would display a significant increase in anxious arousal at the first session, and a significant reduction in peak anxious arousal across sessions. It was further predicted that these indicators of emotional processing would be significantly associated with improvements in GAD symptoms, chronic and acute cognitive avoidance, and IU in individuals who engaged in exposure. No hypotheses were proposed regarding differences between the exposure conditions.

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