



Interpretive style and intolerance of uncertainty in individuals with anxiety disorders: A focus on generalized anxiety disorder[☆]

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ABSTRACT

Interpretations of negative, positive, and ambiguous situations were examined in individuals with generalized anxiety disorder (GAD), other anxiety disorders (ANX), and no psychiatric condition (CTRL). Additionally, relationships between specific beliefs about uncertainty (Uncertainty Has Negative Behavioral and Self-Referent Implications [IUS-NI], and Uncertainty Is Unfair and Spoils Everything [IUS-US]) and interpretations were explored. The first hypothesis (that the clinical groups would report more concern for negative, positive, and ambiguous situations than would the CTRL group) was supported. The second hypothesis (that the GAD group would report more concern for ambiguous situations than would the ANX group) was not supported; both groups reported similar levels of concern for ambiguous situations. Exploratory analyses revealed no differences between the GAD and ANX groups in their interpretations of positive and negative situations. Finally, the IUS-US predicted interpretations of negative and ambiguous situations in the full sample, whereas the IUS-NI did not. Clinical implications are discussed.

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1. Introduction

It is now well established that anxious individuals tend to interpret ambiguous information in a negative fashion (see, e.g., MacLeod & Cohen, 1993). This negative interpretation bias has been observed in individuals with generalized anxiety disorder (GAD) (MacLeod & Rutherford, 2004), social phobia (Franklin, Huppert, Langner, Leiberg, & Foa, 2005; Rapee & Heimberg, 1997), panic disorder (Clark et al., 1997; McNally, 1994), specific phobia (Becker & Rinck, 2004), post-traumatic stress disorder (Elwood, Williams, Olatunji, & Lohr, 2007), and in those with high levels of trait anxiety (MacLeod & Cohen). In addition, it appears that interpretation biases may play a role in the etiology of anxiety. When interpretation style is manipulated using cognitive bias modification for interpretation (CBM-I) paradigms, subsequent interpretations

of ambiguous situations are affected in a manner that is consistent with the manipulation (Brosan, Hoppitt, Shelfner, Sillence, & Mackintosh, 2011; Mackintosh, Mathews, Yiend, Ridgeway, & Cook, 2006; Mathews & Mackintosh, 2000; Salemink & van den Hout, 2010). In some cases, CBM-I paradigms have also been shown to reduce anxiety disorder symptoms (e.g., social anxiety disorder; Beard & Amir, 2008).

Despite evidence that interpretation biases may play a role in the etiology of pathological anxiety (Clerkin & Teachman, 2011), relatively few studies have examined the degree to which *specific types of interpretations* characterize *specific* disorders. The available evidence, however, generally supports the specificity hypothesis. For example, compared to individuals with elevated levels of anxiety and dysphoria, socially anxious individuals rate *socially* ambiguous interactions more negatively (Amir, Beard, & Bower, 2005). In addition, individuals with panic disorder rate *internal* ambiguous stimuli (e.g., heart palpitations) as more threatening than do individuals with social phobia (Harvey, Richards, Dziadosz, & Swindell, 1993).

Uncovering the specificity of interpretation biases to certain disorders may guide therapeutic interventions. In the case of panic disorder, the available data suggest that the reevaluation of catastrophic interpretations of ambiguous physiological stimuli should be the main focus of treatment. Indeed, cognitive-behavioral

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treatments for panic disorder that include interoceptive exposure appear to be more efficacious than other forms of treatment (Gould, Otto, & Pollack, 1995). Despite the potential clinical implications, no study to date has examined if the pattern of interpretation biases in GAD differs from those observed in other anxiety disorders. Given the breadth of worry themes reported by individuals with GAD, it may be that the interpretation bias in GAD is more pervasive than the bias observed in other anxiety disorders.

One reason that interpretation biases may be particularly ubiquitous in individuals with GAD relates to their inability to tolerate uncertainty. Intolerance of uncertainty (IU) has been defined as “a dispositional characteristic resulting from negative beliefs about uncertainty and its implications” (Dugas & Robichaud, 2007, p. 24). Although there is currently considerable debate about whether IU is best conceptualized as a GAD-specific or transdiagnostic cognitive vulnerability (Sternheim, Startup, & Schmidt, 2011), there is evidence that when assessed with the Intolerance of Uncertainty Scale (as in the current study), IU may be relatively specific to GAD (Genetes & Ruscio, 2011). Because individuals with GAD worry about a variety of topics (American Psychiatric Association [APA], 2000), they might find various, if not most types of uncertainty-inducing stimuli, aversive. In contrast, individuals with other anxiety disorders might find a relatively restricted range of ambiguous information aversive. As previously mentioned, a person with panic disorder might be intolerant of physiologically ambiguous stimuli, but may be relatively tolerant of socially ambiguous stimuli. If individuals with GAD are intolerant of *most* types of uncertainty-inducing situations, then this increased breadth of intolerable situations might lead to a relatively greater frequency of negative interpretations. Stated differently, individuals with GAD might experience more negatively biased interpretations in a given day compared to individuals with other anxiety disorders (simply because GAD is associated with an intolerance to a broad range of uncertainty-inducing situations). If negative interpretation biases are more pervasive in GAD relative to other anxiety disorders, then treatments for GAD should address a broad range of uncertainty-inducing situations (novel, unpredictable or ambiguous situations that relate to interpersonal issues, health issues, financial issues, etc.).

To date, most research has focused on interpretations of ambiguous situations, with less research focusing on interpretations of situations that are unambiguously negative or positive. However, the extent to which appraisals of positive and negative situations differ between anxious and non-anxious individuals may have clinical relevance. Research suggests that individuals with social anxiety appraise negative social events more negatively than do non-anxious individuals (Stopa & Clark, 2000; Wilson & Rapee, 2005). Higher levels of social anxiety are also associated with the tendency to appraise positive events in a less positive way (Alden, Taylor, Mellings, & Laposa, 2008). Importantly, most research has examined biased interpretations of negative and positive situations as they relate to social anxiety (Nelson, Lickel, Sy, Dixon, & Deacon, 2010), with fewer studies examining these types of biased interpretations in other types of anxiety disorders such as GAD. Yet it may be important to establish whether individuals with GAD (and other anxiety disorders) are also characterized by biased interpretations of positive and negative situations. Given the focus on social anxiety in this research area, it is not surprising that the nature of these positive and negative situations has been predominately social (Nelson et al.). As individuals with GAD worry about various types of situations, positive and negative non-social situations should also be investigated (e.g., health, work, and finances). Therefore, an investigation of the extent to which biased interpretations of various types of positive and negative situations are associated with GAD relative to other anxiety disorders would further our understanding of cognitive processing in GAD, and possibly lead

to improved treatments. For example, if individuals with GAD perceive positive information as relatively neutral, then re-evaluating interpretations of objectively positive situations during treatment may lead to improved outcomes. Specifically, enabling clients to re-evaluate positive events as being more positive, and negative events as being less negative, may enhance therapeutic outcomes.

As mentioned previously, most of the cognitive processing research focusing on anxiety disorders has examined the relation between symptoms and information processing (Calvo & Castillo, 2001; MacLeod & Mathews, 1991). Comparatively, much less research has focused on the relation between cognitive vulnerability (e.g., maladaptive beliefs) and information processing. Considering that cognitive theories emphasize the relationship between maladaptive beliefs and information processing, it is surprising that few studies have investigated the extent to which beliefs relate to cognitive processing; however, some researchers have begun to examine this relation. For example, Teachman (2005) examined the relationship between anxiety sensitivity and interpretation biases. Anxiety sensitivity refers to the tendency to interpret physiological symptoms of anxiety (e.g., racing heart) in a catastrophic way, and this tendency has been shown to predict the onset of panic disorder (Schmidt, Lerew, & Jackson, 1999). Teachman presented ambiguous scenarios to individuals high and low on anxiety sensitivity and found evidence for an interpretation bias in the high, but not the low anxiety sensitivity group. Furthermore, this difference remained significant even when individuals with a prior history of panic attacks were excluded from analyses. Therefore, the tendency to interpret ambiguity negatively does not appear to be simply a by-product of anxiety, but is associated with cognitive vulnerability for panic disorder (Teachman).

In the context of GAD, Dugas, Hedayati, et al. (2005) found that IU was a unique predictor of negative interpretations of ambiguous information above and beyond demographic and symptom variables (e.g., worry, anxiety, and depression). Similarly, Koerner and Dugas (2008) found that individuals who were higher in IU interpreted ambiguous situations more negatively than did those who were more tolerant of uncertainty.

In addition to the debate concerning the specificity of IU, there is much discussion regarding the specific beliefs or factors that contribute to IU (Berenbaum, Bredemeier, & Thompson, 2008; Buhr & Dugas, 2002; Carleton, Norton, & Asmundson, 2007; Sexton & Dugas, 2009). Emerging evidence supports the presence of two distinct yet related factors (Birrell, Meares, Wilkinson, & Freeston, 2011), although the exact nature of these two factors remains unclear (Birrell et al.; Carleton et al.; Sexton & Dugas). Sexton and Dugas argued that the two factors represent: (1) the belief that Uncertainty Has Negative Self-Referent and Behavioral Implications (hereafter referred to as “Uncertainty Has Negative Implications”); and (2) the belief that Uncertainty Is Unfair and Spoils Everything (hereafter referred to as “Uncertainty Is Unfair”). Birrell et al. described the two beliefs by the typical responses they evoke in the face of uncertainty. Specifically, they proposed that the first belief leads to approach-related responses when faced with uncertainty whereas the second belief leads to avoidant responses. Sexton and Dugas used the 27-item Intolerance of Uncertainty Scale (IUS; Buhr & Dugas) to derive their factors, whereas Birrell et al. referenced the shortened 12-item IUS (Carleton et al.) to guide their interpretation of the factors. Despite this, it is noteworthy that the questionnaire items comprising the Avoidance subscale overlap with the questionnaire items that comprise the Uncertainty Has Negative Implications subscale. Similarly, the questionnaire items that comprise the Approach subscale overlap with the questionnaire items that comprise the Uncertainty Is Unfair subscale. For the current study, the conceptualizations put forth by Sexton and Dugas are used for the two main reasons. First, it is unknown if the 12-item IUS used by Birrell et al. preserves the full IU

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