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Training interpretation biases among individuals with body dysmorphic disorder symptoms

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ABSTRACT

The current study provided an initial test of a Cognitive Bias Modification for Interpretations (CBM-I) training paradigm among a sample with elevated BDD symptoms ($N = 86$). As expected, BDD-relevant interpretations were reduced among participants who completed a positive (vs. comparison) training program. Results also pointed to the intriguing possibility that modifying biased appearance-relevant interpretations is causally related to changes in biased, socially relevant interpretations. Further, providing support for cognitive behavioral models, residual change in interpretations was associated with some aspects of *in vivo* stressor responding. However, contrary to expectations there were no significant effects of condition on emotional vulnerability to a BDD stressor, potentially because participants in both training conditions experienced reductions in biased socially-threatening interpretations following training (suggesting that the "comparison" condition was not inert). These findings have meaningful theoretical and clinical implications, and fit with transdiagnostic conceptualizations of psychopathology.

Introduction

Body dysmorphic disorder (BDD) is characterized by persistent thoughts regarding a slight or imagined defect in appearance (American Psychiatric Association, 2013; Buhlmann et al., 2002; Wilhelm & Neziroglu, 2002). This preoccupation causes significant distress and can be socially and/or occupationally debilitating (Veale, 2004). Individuals who suffer from BDD spend significant amounts of time engaged in behaviors such as comparing features to other people, skin-picking, mirror gazing (i.e., spending excessive time looking in the mirror), and reassurance seeking (Veale, 2004). Given the extreme distress and social avoidance related to BDD (Veale, 2004), it is critical to study the possible mechanisms that may drive associated symptoms.

Biased interpretations, a type of cognitive bias, confer one possible mechanism thought to contribute to the maintenance of BDD symptoms (Buhlmann et al., 2002; Clerkin & Teachman, 2009; Wilhelm & Neziroglu, 2002). The primary goal of the present study was to evaluate whether it is possible to shift appearance-related interpretations among a sample of individuals with elevated BDD symptoms using a Cognitive Bias Modification for Interpretations (CBM-I) training procedure. Further, to evaluate the causal status of BDD-relevant interpretations in subsequent symptomatology, we tested whether a positive CBM-I training task was associated with reduced emotional vulnerability to two BDD-relevant stressor tasks.

Cognitive-behavioral Models of BDD

Cognitive-behavioral models of emotional disorders emphasize distorted cognition as one potential mechanism driving disorder-relevant behaviors (e.g., Beck & Clark, 1997). In the context of BDD, individuals tend to have pan-situational, maladaptive cognitions that tap negative appearance-relevant beliefs across many different domains (Didie, Kelly, & Phillips, 2010; Wilhelm & Neziroglu, 2002). These maladaptive beliefs may contribute to the maintenance of the BDD symptoms insofar as individuals with BDD tend to overvalue, or overemphasize the meaning and importance of being physically attractive (Feusner, Neziroglu, Wilhelm, Mancuso, & Bohen, 2010). For example, individuals with BDD may endorse the beliefs that appearance is equated with personal value (Feusner et al., 2010; Wilhelm & Neziroglu, 2002) and that appearance is a defining characteristic of the self (Veale, 2004).

Importantly, these maladaptive beliefs regarding the importance of attractiveness may cause individuals with BDD to attend to, remember, perceive, and interpret information that is consistent with their maladaptive beliefs (Buhlmann et al., 2002; Veale et al.,

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1996; Wilhelm & Neziroglu, 2002). More specifically, individuals with BDD may endorse the belief that appearance is fundamentally tied to their identity. As a result, cognitive models of BDD predict that when these individuals are confronted with ambiguous situations that require interpretation (e.g., observing others laughing), they might be more likely to make negative, appearance-relevant interpretations that lead to distress (e.g., "They are laughing at me because of the way I look;" Wilhelm & Neziroglu, 2002).

To date, most of the research suggesting that interpretive biases are problematic for individuals with BDD symptoms has been correlational (e.g., Buhlmann et al., 2002). For example, Buhlmann et al. (2002) found that patients diagnosed with BDD showed negative interpretive biases for both appearance-relevant and social situations. Specifically, individuals with BDD (compared to participants diagnosed with obsessive-compulsive disorder and healthy control participants) showed a tendency to interpret ambiguous scenarios as negatively related to their appearance (Buhlmann et al., 2002; see Clerkin & Teachman, 2008, for a partial replication of this finding with an analogue clinical sample). In a related study, individuals with elevated BDD symptoms completed Buhlmann and colleagues' measure of interpretation bias (2002), followed by a series of mirror-gazing tasks (Clerkin & Teachman, 2009). Consistent with cognitive-behavioral models, results indicated that interpretations tied to appearance uniquely predicted self-reported desire to avoid each mirror.

Cognitive Bias Modification for Interpretations

The present study tested the causal premise that maladaptive interpretations are associated with BDD symptom expression. Specifically, we tested (1) whether it is possible to experimentally manipulate appearance-relevant interpretations using a CBM-I paradigm; and (2) whether a positive (vs. comparison) training program would lower distress and desired avoidance in response to two BDD stressor tasks. These tests will critically advance the field by testing whether a causal relationship exists between interpretive biases and emotional vulnerability in the context of BDD symptoms.

Within the past decade, there has been an explosion of research using CBM-I to target a broad range of interpretation biases and clinical symptoms (see Hallion & Ruscio, 2011; MacLeod & Mathews, 2012). Much of this research has been based on the pioneering research of Mathews and Mackintosh (2000), who successfully trained participants to make negative or benign interpretations of ambiguous events. Critically, results from Mathews and Mackintosh (2000) and subsequent studies provided direct experimental support for the existence of a causal relationship between interpretation biases and emotional vulnerability, or clinical symptoms (in this case, state anxiety; see also Mathews & MacLeod, 2002).

Previous research has been fairly consistent in finding that biased interpretations can be positively modified with the use of CBM-I procedures (see Hallion & Ruscio, 2011). However, research regarding the impact of interpretation training on emotional vulnerability has been somewhat mixed (Hallion & Ruscio, 2011; Menne-Lothman et al., 2014). Some studies have not found a relationship or have shown a weak relationship between CBM-I and emotional vulnerability (see Menne-Lothman et al., 2014). In contrast, there has been some evidence supporting a relationship between interpretive biases and change in corresponding emotional vulnerability, particularly in the context of anxiety and related symptoms (e.g., social anxiety, Beard & Amir, 2008; obsessive-compulsive disorder symptoms, Clerkin & Teachman, 2011; general vulnerability to anxiety, Wilson, MacLeod, Mathews, & Rutherford, 2006). As one representative example, Wilson and colleagues (2006) demonstrated a relationship between modifying interpretive biases in a single training session and reduced emotional reactivity in response to distressing video clips depicting real-life rescue operations.

Study Summary and Hypotheses

The current study had two central aims and hypotheses. The first aim was to assess whether interpretive biases can be modified among individuals with elevated BDD symptoms. Specifically, we conducted a two-session study in which participants completed either a positive CBM-I training or a comparison training. We hypothesized that participants randomly assigned to the positive (vs. comparison) CBM-I training sessions would experience a reduction in appearance-relevant interpretations. The second aim was to assess the causal relationship between biased interpretations and BDD symptoms. Given the brevity of training (two sessions), hypotheses regarding this second aim were more exploratory, particularly in light of the mixed findings of CBM-I in influencing subsequent emotional vulnerability (Hallion & Ruscio, 2011; Menne-Lothman et al., 2014). However, consistent with cognitive-behavioral models of BDD (Buhlmann et al., 2002; Wilhelm & Neziroglu, 2002), we hypothesized that changes in interpretations would be associated with reduced emotional vulnerability as measured by two *in vivo* stressor tasks.

Method

Participants

Following IRB approval of the current study, undergraduate participants from a Midwestern University located in the United States were recruited from a psychology recruitment pool based on their score on the Dysmorphic Concerns Questionnaire (DCQ; Mancuso, Knoesen, & Castle, 2010), which was administered as part of a larger mass survey questionnaire. Across three semesters, roughly 1014 participants completed all items on the DCQ during mass testing, and from this larger sample, 264 scored a 9 or above on the DCQ. We invited individuals who provided us with contact information, and who scored $\geq$9 on the DCQ (n = 211). From this invited sample, 93 participants chose to participate in the study.

Previous research found that a DCQ cutoff score of 9 correctly classified 96.4% of BDD patients (sensitivity) and 90.6% of unselected undergraduate students (specificity) (Mancuso et al., 2010). Thus, the current study recruited participants who scored 9 and above, resulting in a sample with elevated BDD symptoms. In fact, the mean score for the DCQ in our sample was greater than 2 standard deviations above the mean score reported for the undergraduate sample in Mancuso et al. (2010).

Before completing analyses, we eliminated seven participants who only completed the first part of the study. This resulted in a final sample size of 86 (69 female). Participants (M_{age} = 18.65, SD_{age} = 0.91) were predominantly White (88.4% White, 1.2% Asian, 3.5% Black/African American, 4.7% Bi- or Multiracial, 2.3% Other), and 96.5% reported ethnicity as not Hispanic/Latino.

Materials

Pre-training BDD symptoms and distress. Baseline symptoms were first assessed during preselection using the Dysmorphic Concern Questionnaire (DCQ; Oosthuizen, Lambert, & Castle, 1998). The DCQ is a 7-item continuous measure that asks participants about concerns related to the appearance and functionality of their body parts, as well as preoccupation and compulsive behavior surrounding appearance concerns. Respondents rate their concern about their physical appearance relative to others on a 4-point scale. DCQ reliability in the current sample was low, Cronbach's alpha = .55.