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Relationship between Social Anxiety Disorder and Body Dysmorphic Disorder

Angela Fang and Stefan G. Hofmann

Department of Psychology at Boston University.

Abstract

Social anxiety disorder (SAD) and body dysmorphic disorder (BDD) are two separate, but conceptually overlapping nosological entities. In this review, we examine similarities between SAD and BDD in comorbidity, phenomenology, cognitive biases, treatment outcome, and cross-cultural aspects. Our review suggests that SAD and BDD are highly comorbid, show a similar age of onset, share a chronic trajectory, and show similar cognitive biases for interpreting ambiguous social information in a negative manner. Furthermore, research from treatment outcome studies have demonstrated that improvements in SAD were significantly correlated with improvements in BDD. Findings from cross-cultural research suggest that BDD may be conceived as a subtype of SAD in some Eastern cultures. Directions for future research and clinical implications of these findings are discussed.

Keywords

social anxiety disorder; social phobia; body dysmorphic disorder; obsessive compulsive spectrum; classification; epidemiology; diagnosis; nosology

Extensive research has investigated the comorbidity between social anxiety disorder (SAD) and other psychological disorders, including mood disorders, other anxiety disorders, and substance use disorders. Few studies, however, have examined the relationship between SAD and body dysmorphic disorder (BDD), despite evidence indicating that BDD is the fourth most common comorbid disorder among individuals with SAD (Hollander & Aronowitz, 1999). BDD is marked by an excessive preoccupation with a slight or imagined defect in appearance. This imagined defect is related to a fear of negative evaluation by others, which is the core feature of SAD. In addition, BDD is conceptualized as a form of SAD in certain Eastern cultures. Given this conceptual overlap, it is surprising that relatively little research exists on the relationship between SAD and BDD. The goal of this review is to examine the nature of this overlap and to identify features that may be unique to this relationship. First, we will analyze the current literature on the similarities and differences between SAD and BDD in terms of diagnostic issues, cognitive biases, cross-cultural aspects, and treatment outcome. Then, we will discuss the relationship between BDD and other clinical syndromes and identify potential avenues for future research.

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Corresponding author: Stefan G. Hofmann, Ph.D., Department of Psychology, Boston University, 648 Beacon St., 6th floor, Boston, MA 02215, Tel: (617) 353-9233, Fax: (617) 353-9609, shofmann@bu.edu.

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Definition of SAD

SAD is one of the most common psychiatric conditions. The epidemiological literature reports lifetime prevalence rates of SAD in Western countries ranging between 7% and 12% of the population (Furmark, 2002; Kessler et al., 2005). The disorder affects men and women relatively equally as evaluated in community studies. SAD often begins in the mid-teens, but can also occur in early childhood. During childhood, SAD is often associated with shyness, behavioral inhibition, overanxious disorder, mutism, school refusal, and separation anxiety. If the problem is left untreated, it typically follows a chronic, unremitting course and leads to substantial impairments in vocational and social functioning (Stein & Kean, 2001).

The DSM-IV (APA, 1994) defines SAD as “a marked and persistent fear of social or performance situations in which embarrassment may occur” (p. 411). The DSM-IV notes that the anxiety response may take the form of a situationally bound or situationally predisposed panic attack. With the core defining feature being the fear of negative evaluations by others, many different social situations can cue social anxiety: performance situations such as speaking, eating, or writing in public, initiating or maintaining conversations, going to parties, dating, meeting strangers, or interacting with authority figures. Public speaking is the most commonly feared social situation.

The DSM-IV instructs clinicians to assign a generalized subtype of SAD “when the [individual’s] fears are related to most social situations” (APA, 1994, p. 451). Therefore, DSM subtypes are defined based on the number of feared social situations. In addition, it is possible to assign the Axis II disorder avoidant personality disorder, which is highly comorbid with the generalized subtype of SAD. A recent review of the differences and similarities between the diagnostic subtypes are presented elsewhere (e.g., Hofmann, Heimrichs, & Moscovitch, 2004).

Definition of BDD

Although cases of “imagined ugliness” have been documented for centuries, BDD has only recently begun to receive empirical attention (Phillips, 2005). Introduced to the DSM-III in 1980, such over-concern with physical appearance was termed “dysmorphophobia,” which was categorized as an atypical somatoform disorder (APA, 1980). The construct was re-labeled and retained in the DSM-III-R as “body dysmorphic disorder,” in part due to controversy surrounding the imprecision of the term as referring to both a symptom and a syndrome (Jorgensen, Castle, Roberts, & Groth-Marnat, 2001). BDD is characterized by a marked concern that one’s appearance is ugly or flawed, in the absence of a real physical deformity or anomaly (APA, 1994). This concern manifests in persistent thoughts of one’s appearance, and ways of hiding, checking, or fixing one’s appearance (Phillips, Menard, Fay, & Weisberg, 2005). In addition, BDD is characterized by repetitive and secretive time-consuming behaviors, such as excessive mirror checking, grooming, camouflaging, reassurance seeking, touching or measuring body parts, researching methods to improve appearance, and comparing appearance with others (Phillips, Menard, Fay, & Weisberg, 2005). The most common areas of concern involve the skin, hair, and nose (Phillips, Menard, Fay, & Weisberg, 2005). BDD is also marked by avoidance of people, places, and social situations, which contributes to poor functioning and low quality of life (Phillips, Menard, Fay, & Pagano, 2005). In severe cases, individuals with BDD will become housebound due to the fear of being seen by others (Phillips, McElroy, Keck, & Pope, 1993).

The predominant view of BDD is that it may be an obsessive compulsive spectrum disorder (Mataix-Cols, Pertusa, & Leckman, 2007). Based on similarities in demographics, course, onset, comorbidity, familial genetics, and preferential treatment response, researchers have proposed that BDD may share pathogenic pathways with obsessive compulsive disorder (OCD)

(Chosak et al., 2008; Phillips, McElroy, Hudson, & Pope, 1995; Phillips et al., 2007; Storch, Abramowitz, & Goodman, 2008). For example, studies have shown rates of comorbidity as high as 30% between OCD and BDD (Gunstad & Phillips, 2003; Phillips, Menard, Fay, & Weisberg, 2005). Evidence also indicates that family members of individuals with OCD are at greater risk for developing obsessive-compulsive spectrum disorders, such as BDD and hypochondriasis, which suggests a genetic link between OCD and BDD (Bienvenu et al., 2000). There is still much debate over the conceptualization and classification of BDD, with some researchers proposing that it falls at the extreme end of a unidimensional construct of dysmorphic concern (Oosthuizen, Lambert, & Castle, 1998), and others suggesting that it may belong on an affective spectrum of disorders, which share a common pathophysiology (Phillips et al., 1995).

Diagnostic Overlap

Comorbidity

Studies have shown that among individuals with a lifetime diagnosis of SAD (generalized or non-generalized subtypes), 52–80% have a lifetime diagnosis of at least one other psychiatric disorder (Chartier, Walker, & Stein, 2003; Grant et al., 2005; Merikangas & Angst, 1995; Ruscio et al., 2008). Approximately one-third to three-quarters of individuals with the generalized subtype of SAD meet diagnostic criteria for another lifetime disorder (Chartier et al., 2003; Kessler, Stein, & Berglund, 1998; Stein, Tancer, Gelernter, & Vittone, 1990). In fact, individuals with the generalized subtype of SAD are approximately three times more likely to have comorbid anxiety disorders, and two times more likely to have comorbid mood disorders, than individuals with the non-generalized subtype (Wittchen, Stein, & Kessler, 1999). This may suggest that individuals with a generalized subtype of SAD not only have a more severe form of SAD, but are also at increased risk for developing other mood and anxiety disorders due to a greater general vulnerability (Rosenbaum et al., 2000). Comorbidity between SAD, particularly the generalized subtype, and other disorders is associated with greater impairment of occupational and social functioning, greater likelihood of alcohol dependence, and greater likelihood of attempting suicide (Lydiard, 2001). Similarly, having BDD in addition to a comorbid Axis I disorder is associated with adverse consequences compared to having BDD only, such as a greater likelihood of not being employed, being housebound due to BDD, and having a history of suicide ideation and attempts (Coles et al., 2006; Gunstad & Phillips, 2003). Such findings emphasize the importance of identifying individuals with comorbidities, as they are at greater risk for poor outcomes. One major problem in the literature, however, is that studies examining comorbidity rates in SAD (generalized subtype and the residual category) rarely include BDD, in part due to the fact that BDD is currently classified in the DSM-IV as a somatoform disorder, and is largely under-recognized and under-studied. As a result, data on the comorbidity between SAD and BDD is limited, and may be underestimated.

Previous studies show that BDD is the fourth most common comorbid disorder among individuals with SAD, preceded by simple phobias, alcohol abuse, and major depressive disorder (MDD) (Hollander & Aronowitz, 1999). Among individuals suffering from BDD, as many as 12–68.8% also have SAD, and among those with SAD, 4.8–12% also have BDD (Brawman-Mintzer, Lydiard, Phillips, & Morton, 1995; Coles et al., 2006; Gunstad & Phillips, 2003; Hollander, Cohen, & Simeon, 1993; Menezes, Fontenelle, & Versiani, 2005; Phillips & Diaz, 1997; Wilhelm, Otto, Zucker, & Pollack, 1997; Zimmerman & Mattia, 1998). Variation in point prevalence of SAD among individuals with BDD is likely due to methodological differences in sample sizes, recruitment strategies, and assessment of BDD. Sample sizes of BDD patients have varied widely across studies, ranging from 16 (Zimmerman & Mattia, 1998) to 293 (Gunstad & Phillips, 2003). One study examining the prevalence of BDD in a sample of outpatients with anxiety disorders found that 6.7% of patients (11 out of 165) met criteria for a diagnosis of BDD (Wilhelm et al., 1997). Consistent with these findings, another

study found that the prevalence rate of BDD was highest among those with SAD (11%) and OCD (8%) in a sample of patients with anxiety disorders and major depression (Brawman-Mintzer et al., 1995). Therefore, data suggest that SAD and BDD are highly comorbid disorders. In addition, BDD shares high rates of comorbidity with other disorders, particularly OCD and MDD (Gunstad & Phillips, 2003; Phillips, 2002a). It has been found that approximately 54–61% of BDD patients also have a current diagnosis of MDD and 25% also have current OCD (Gunstad & Phillips, 2003). Such estimates of comorbidity are supported by other studies documenting that 37.3% of BDD patients have current MDD, 32.9% have current SAD, and 26.1% have current OCD (Phillips & Stout, 2006). BDD also appears to be highly comorbid with eating disorders. For example, a study of 200 individuals with a lifetime diagnosis of BDD found that 32.5% had a lifetime eating disorder, with 15% having anorexia nervosa and/or bulimia nervosa (Ruffolo, Phillips, Menard, Fay, & Weisberg, 2006). As such, high rates of comorbidity between BDD and SAD are not unique to this relationship because comorbidity data suggest that BDD also overlaps highly with OCD, MDD, and eating disorders. It is also unclear whether high rates of comorbidity between SAD and BDD simply reflect the higher base rate of SAD (Coles et al., 2006).

Studies examining the relationship between SAD and BDD have not distinguished the diagnostic subtypes of SAD (i.e., the generalized subtype and the additional diagnosis of avoidant personality disorder). There is an overall lack of information about the number and content of social fears in patients with BDD, as studies have only reported the presence or absence of a diagnosis of SAD, or severity of self-reported SAD symptoms in BDD patients. Some evidence suggests that BDD may be more closely related to the generalized subtype of SAD. Studies have shown that BDD is highly comorbid with avoidant personality disorder (Veale, Boocock, Gournay, & Dryden, 1996), which tends to occur more commonly with generalized SAD (Holt, Heimberg, & Hope, 1992; Schneier, Spitzer, Gibbon, & Fyer, 1991). Furthermore, data on SAD symptoms in BDD patients indicate high levels of social anxiety, which is comparable to severity of social anxiety symptoms found in patients with generalized SAD (Coles et al., 2006; Pinto & Phillips, 2005; Veale, Boocock et al., 1996). These findings suggest that there may be an effect of SAD subtype on the relationship between SAD and BDD. To further explore this possibility, future research should examine whether BDD is more highly comorbid with generalized or non-generalized SAD by delineating the number of feared social situations among BDD patients.

Course and Onset

Longitudinal studies show that the typical age of onset of generalized SAD is during childhood or adolescence, with a mean age of onset of approximately 14 years (Wittchen & Fehm, 2003; Yonkers, Dyck, & Keller, 2001). Onset of the isolated fear of public speaking appears to occur later than other social fears (Heimberg, Stein, Hiripi, & Kessler, 2000; Hofmann et al., 2004), and generalized SAD has been shown to have an onset up to two years earlier than non-generalized SAD (Holt et al., 1992; Schneier et al., 1991; Wittchen et al., 1999). Similarly, prospective data reveal that the typical age of onset of BDD occurs in late childhood to early adolescence, at around age 16 (Coles et al., 2006; Gunstad & Phillips, 2003; Phillips, Menard, Fay, & Weisberg, 2005). Studies examining the course of BDD and SAD (particularly the generalized subtype) demonstrate that both disorders tend to follow a chronic, unremitting course (Hofmann & Otto, 2008; Moutier & Stein, 1999; Wilhelm, 2006).

Several studies have shown that the onset of SAD usually precedes the onset of later comorbid disorders such as major depression and problematic substance use (Bittner et al., 2004; Chartier et al., 2003; Keller, 2003; Kessler, Stang, Wittchen, Stein, & Walters, 1999; Lepine & Pelissolo, 1998; Lydiard, 2001; Schneier, Johnson, Hornig, & Liebowitz, 1992; Stein et al., 2001; Van Ameringen, Mancini, Styan, & Donison, 1991; Zimmermann et al., 2003). For example, one

study revealed that among individuals with SAD (regardless of subtype) and a mood disorder, 68.5% indicated that SAD developed before depression by an average of 12.3 years, using epidemiological data from the U.S. National Comorbidity Survey (Kessler et al., 1999). It is possible, however, that the earlier onset of SAD in cases of comorbid depression simply reflects the typical onset of SAD in adolescence and the typical onset of depression in early to mid adulthood. Such research suggests that SAD may be a risk factor for the development of later comorbid conditions.

Although there has been little investigation on early onset SAD as a risk factor for BDD, available research is consistent with previous findings, as studies have demonstrated the temporal precedence of SAD among individuals who have both disorders (Coles et al., 2006; Phillips et al., 1993; Wilhelm et al., 1997). In one study, mean age of BDD onset was 16.69 years, as compared to the mean age of SAD onset of 11.74 years, for people with both SAD and BDD (Coles et al., 2006). Wilhelm et al. (1997) found that SAD preceded BDD in all cases studied, emerging on average 12.6 years earlier than BDD (Wilhelm et al., 1997). However, it remains unclear whether earlier onset of SAD actually reflects an etiological course for the later development of BDD, or simply indicates the ages of onset that are typically observed in SAD and BDD. These studies also did not distinguish between diagnostic subtypes of SAD. Therefore, future studies should examine whether the early onset of one subtype of SAD is more likely to lead to development of BDD.

Complicating the research on the relationship between SAD and BDD even further is the possibility that multiple etiological factors and mechanisms may impact their development and persistence (Phillips & Stout, 2006). For example, it is possible that high rates of comorbidity between SAD and BDD reflect two related disorders with shared etiologies and common risk factors (Phillips & Stout, 2006). It is also possible that they reflect distinct etiologies, and that having SAD may predispose individuals for BDD, but the possibility of one model does not necessarily preclude the other (Phillips & Stout, 2006). This may explain some inconsistencies in the research. One study examining 200 BDD patients over the course of three years found no longitudinal associations between SAD and BDD (Phillips & Stout, 2006). Similarly, another study revealed that the comorbidity of SAD among BDD patients did not predict lower likelihood of remission from BDD (Coles et al., 2006). These analyses, however, were limited by a lack of power and do not necessarily indicate that SAD and BDD are unrelated disorders (Coles et al., 2006; Phillips & Stout, 2006). Contrary to this finding, a recent study among BDD patients (without a diagnosis of SAD) found that socially anxious symptoms independent of BDD at baseline significantly predicted poorer psychosocial functioning one year later, which does suggest prospective associations between BDD and subclinical socially anxious symptoms (Kelly, Walters, & Phillips, 2010). Such inconsistencies in prospective data may reflect the possibility, or even likelihood, that multiple etiological processes are in play. As will be discussed further below, evidence suggests that SAD and BDD are similar in phenomenology, clinical characteristics, cognitive biases, treatment response, and are even conceptualized as variants of the same disorder in certain cultures. Furthermore, SAD and BDD may be influenced by common risk factors such as heightened sensitivity to rejection.

Demographic Characteristics

Large epidemiology studies, such as the National Comorbidity Survey and Epidemiologic Catchment Area, have demonstrated that SAD is somewhat more prevalent among women (Kessler, McGonagle, Zhao, & Nelson, 1994; Schneier et al., 1992). Similar findings from population-based studies have been found for BDD as a recent study surveying over 2,500 adults in the U.S. found a point prevalence of BDD of 2.5% for women and 2.2% for men, which demonstrates a slight preponderance of BDD among women (Koran, Abujaoude, Large, & Serpe, 2008). Furthermore, one population-based study found a prevalence of 0.7% of BDD

in a single age cohort of a community sample of women ages 36–44 (Otto, Wilhelm, Cohen, & Harlow, 2001). Data from clinical samples of BDD have yielded mixed findings, as some studies have found equal gender distributions (Phillips & Diaz, 1997), whereas others have found that women are more likely to have BDD (Phillips, Menard, & Fay, 2006). These inconsistencies may be due to methodological variability in sample size and sampling methods. Overall, studies tend to show either a fairly equal gender ratio or a slightly greater prevalence of SAD and BDD in women.

Research on gender differences in SAD has shown that SAD seems to be slightly more common among women, but men are more likely to seek treatment (Weinstock, 1999). It has been suggested that men may experience more distress than women and that differences in gender socialization may explain why men with SAD tend to seek treatment more than women (Weinstock, 1999). Within the BDD literature, gender differences in treatment seeking behavior are unknown, as available research has only examined tendencies for BDD patients to seek cosmetic remedies for their appearance concerns over psychological treatments. However, studies have consistently demonstrated that men and women with BDD report concern with different body parts (Phillips & Diaz, 1997; Phillips et al., 2006). For example, men with BDD tend to be concerned with body build and thinning hair, whereas women with BDD tend to be more concerned with their weight and hips (Phillips & Diaz, 1997; Phillips et al., 2006). There may also be other gender differences, as men are more likely to be single, have a substance use disorder, and use a hat for camouflage, while women are more likely to have bulimia nervosa and use their hands and makeup for camouflage (Phillips & Diaz, 1997).

As far as other sociodemographic variables besides gender, it has been shown that individuals with SAD are less well-educated, have a lower income level, and are less likely to be married than individuals without SAD (Moutier & Stein, 1999). Those with generalized SAD are less likely to be employed and have lower levels of education than those with non-generalized SAD (Heimberg, Hope, Dodge, & Becker, 1990). Similarly, evidence indicates that individuals with BDD are predominantly Caucasian, single (never married), and are less likely to be a college graduate, compared to individuals without BDD, although these findings were not statistically significant (Zimmerman & Mattia, 1998). In addition, recent findings show that BDD patients with SAD were less likely to be married, less likely to have completed at least some college education, and less likely to be currently employed, than BDD patients without SAD, although SAD subtypes were not examined in this study (Coles et al., 2006). Overall, concurrent data suggest that individuals with SAD and BDD are less likely to be married and are less well-educated than individuals without these disorders.

Clinical Characteristics

Suicidality—Research suggests that anxiety disorders are associated with suicidal behavior (Bolton et al., 2008; Cougle, Keough, Riccardi, & Sachs-Ericsson, 2009; Sareen, Houlahan, Cox, & Asmundson, 2005). This seems particularly true for SAD, post-traumatic stress disorder, and generalized anxiety disorder, which are significantly associated with suicide attempts, after controlling for Axis II diagnoses, substance abuse or dependence, and depression (Cougle et al., 2009). Some research has emphasized other anxiety disorders as being significantly more predictive of suicidal ideation and attempts, such as panic disorder and agoraphobia (Bolton et al., 2008). In this study, SAD and OCD did not significantly predict suicidal behavior (Bolton et al., 2008). Thus, there may be discrepancies regarding the particular anxiety disorders which are most associated with suicidality. In the same way that anxiety disorders have been shown to be related to suicidality, research has demonstrated that patients with BDD are an extremely high risk population, and are prone to suicidal behavior (Phillips, 2007; Phillips & Menard, 2006). In fact, one study found that the rate of completed

suicide among people with BDD is 45 times higher than that of the general U.S. population, which indicates a mortality ratio that surpasses anorexia nervosa, major depression, and bipolar disorder (Phillips & Menard, 2006). Convergent evidence from cross-sectional and prospective studies has demonstrated that individuals with BDD have a high rate of suicidal ideation and suicide attempts, with approximately 80% of patients reporting suicidal ideation and 24% having attempted suicide (Phillips, 2007). One study comparing suicidal ideation among BDD and OCD patients found that individuals with BDD reported significantly higher rates of suicide ideation and attempts than those with OCD, which suggests that the associated risk of suicidality is specific to BDD (Phillips, 2007). Similarly, data indicate that attempted suicide rates are significantly greater among individuals with AN and comorbid BDD, compared to individuals with AN without BDD (Grant, Kim, & Eckert, 2002). This finding suggests that comorbid BDD confers additional risk of suicide in patients with AN, and that elevated rates of suicide attempts are specific to BDD. Overall, these data indicate that suicidality is associated with BDD, as well as anxiety disorders such as SAD.

Delusionality and insight—Few studies have compared delusions in SAD and BDD, as compared to schizophrenia spectrum disorders. Available research suggests that individuals with SAD and BDD have a range of insight, and those with particularly poor insight experience positive psychotic symptoms, such as delusions of reference (Meyer & Lenzenweger, 2009; Phillips, 2004).

Delusionality is a prominent feature of BDD, as patients with BDD are often convinced that their imagined flaws are physical, rather than psychological, in nature. As a result, they often present to medical professionals, such as dermatologists and cosmetic surgeons, to correct or improve their appearance (Crerand, Phillips, Menard, & Fay, 2005). In fact, BDD patients may experience other positive psychotic symptoms, such as auditory hallucinations and command hallucinations, which consist of voices criticizing the patient for being ugly, or instructing the patient to kill himself due to his ugliness, although such symptoms are much more rare than delusions of reference (Phillips, 2004). It has also been shown that BDD patients have poorer insight than OCD patients (Eisen, Phillips, Coles, & Rasmussen, 2004). Similar research has found that patients with AN and comorbid BDD have greater delusionality than patients with AN without BDD, which underscores the considerable lack of insight associated with BDD (Grant, Kim, & Crow, 2001). Despite the presence of psychotic features in BDD, research has shown relatively low rates of comorbidity between BDD and psychotic disorders (Gunstad & Phillips, 2003).

One study examining the relationship between anxiety symptoms and psychotic symptoms in 32 outpatients with schizophrenia or schizoaffective disorder found that positive symptoms (e.g., hallucinations, delusions, and bizarre behavior) were significantly associated with obsessive and compulsive symptoms, as well as social anxiety symptoms (Huppert & Smith, 2005). The relationship between psychotic symptoms and obsessive-compulsive symptoms could be partly explained by the patients' interpretation of delusions as intrusive thoughts, which may be difficult to distinguish (Kozak & Foa, 1994), and the relationship between psychotic symptoms and social anxiety symptoms could be explained by the overlap between delusions and ideas of reference or paranoia (Huppert & Smith, 2005). However, other research suggests that referential thinking may be specific to schizophrenia-related psychopathology such as schizotypy, rather than social anxiety (Meyer & Lenzenweger, 2009).

In addition to a general lack of studies investigating delusionality in SAD and BDD, much of the literature appears to struggle with the definition of a delusion and its distinction from an overvalued idea, especially within the BDD and OCD literature (de Leon, Bott, & Simpson, 1989; Kozak & Foa, 1994; Phillips & McElroy, 1993). Accordingly, some researchers have proposed that delusional beliefs in BDD are better characterized as an overvalued idea (de

Leon et al., 1989; Neziroglu & Khemlani-Patel, 2002), which is defined as “a fixed belief with doubting overtones that is unresponsive to challenges,” (Neziroglu & Yaryura Tobias, 1997, p. 327). Future research should not only examine differences in the content and nature of delusions among individuals with SAD and BDD, as this may inform their phenomenological relationship, but it should also investigate the extent to which insight and delusionality in SAD and BDD is distinguishable from schizophrenia-spectrum disorders.

Cognitive Biases

Available research evidence demonstrates that individuals with a generalized subtype of SAD and BDD tend to display negative interpretation biases for ambiguous social information (Amir, Foa, & Coles, 1998; Buhlmann, Wilhelm, et al., 2002; Heinrichs & Hofmann, 2001; Hofmann, 2007). For example, one study recruited 32 treatment-seeking individuals with generalized SAD and administered a questionnaire, which measured their interpretations to 22 social and non-social scenarios (Amir et al., 1998). Participants were asked to rank order three interpretations (positive, negative, and neutral) for each scenario in terms of the likelihood of the thought coming to mind. Individuals with generalized SAD tended to choose negative interpretations of self-relevant ambiguous social situations even when alternative neutral and positive explanations were available, as compared to individuals with OCD and control participants. In a similar study, 19 outpatients with BDD completed a questionnaire with 33 ambiguous social scenarios, of which 11 were BDD-related, 11 were social, and 11 were general scenarios (Buhlmann, Wilhelm, et al., 2002). Participants rated three interpretations per scenario for the likelihood of having them come to mind. Results indicate that individuals with BDD rated negative thoughts as significantly more likely in BDD-related and social scenarios than individuals in the OCD and control groups. These data suggest that individuals with BDD share a similar cognitive bias as those with generalized SAD; they tend to interpret socially ambiguous information in a negative manner.

BDD patients also tend to selectively process emotional information, whether positive or negative in valence, in an emotional Stroop paradigm (Buhlmann, McNally, Wilhelm, & Florin, 2002). This effect was particularly robust when the information was related to BDD. In this study, however, BDD patients did not show the greatest interference for BDD-threat words (i.e. disorder-specific threat cues), which is inconsistent with findings from patients with anxiety disorders, including SAD (Williams, Mathews, & MacLeod, 1996). The authors inferred that the emotional Stroop interference pattern of BDD patients may reflect their concern with both their beauty ideal as well as their imagined ugliness. Furthermore, this study used a version of the Stroop task which involved blocked presentations of words of the same type on cards. This method has been criticized for measuring biases in post-attentional processing because participants may selectively attend to both distractor and threat stimuli simultaneously, rather than selectively attending to the threat stimuli only (Amir & Foa, 2001; Fox, 1994). Therefore, selective attentional processing in BDD warrants further research attention, especially in other, perhaps more direct, measures of attention, such as the probe detection paradigm (Amir & Foa, 2001). Such research may clarify patterns of attentional bias in BDD and SAD patients, and may identify processes involved in the maintenance of these disorders.

Treatment Outcome

Previous studies strongly support that cognitive and behavioral interventions are efficacious for treating both SAD and BDD (Hofmann, 2007; Hofmann & Otto, 2008; Hofmann & Smits, 2008; Neziroglu & Khemlani-Patel, 2002). The cognitive-behavioral therapy (CBT) rationale is remarkably similar for treating both disorders by emphasizing the role of maladaptive cognitions and avoidance in maintaining anxiety. Common components of treatment include

psychoeducation, cognitive restructuring of automatic negative thoughts, exposure and response prevention, and relapse prevention (Hofmann, 2007; Hofmann & Otto, 2008; Neziroglu & Khemlani-Patel, 2002). These components target similar problematic aspects of the disorder, most notably, automatic negative thoughts and avoidance of social situations. Aside from these similarities, CBT for BDD is distinguishable from CBT for SAD, as the former involves additional modular components for perceptual mirror retraining, in addition to optional modules for symptom-specific problems such as skin picking and hair pulling, and weight concerns.

There have been no studies that have specifically examined the effect of a targeted psychological treatment protocol for individuals with SAD and BDD. In addition, treatment studies for SAD have not examined the effect of comorbid BDD on treatment outcome. Some studies examining the efficacy of CBT for BDD have included measures for SAD and have documented changes in SAD following treatment. The main limitations of these studies include the small sample sizes (consisting primarily of females). Furthermore, only a few studies have examined whether improvements in SAD are a function of improvements in BDD. In a randomized controlled pilot trial of CBT for 19 patients (90% female) with a DSM-IV primary diagnosis of BDD, significant improvements were found in BDD and social anxiety symptoms following treatment, as compared to the wait-list control group (Veale, Gournay et al., 1996). Furthermore, another study examined the effect of group CBT for 13 patients with a primary diagnosis of BDD and found that CBT was effective in reducing BDD severity (Wilhelm, Otto, Lohr, & Deckersbach, 1999). However, these findings were tempered by a high attrition rate after treatment began, and intent-to-treat analyses were not reported (Wilhelm et al., 1999). Although depression severity was found to be significantly reduced after therapy along with significant decreases in BDD symptoms, measures assessing social anxiety symptoms were not reported in this study.

As for pharmacological treatments, selective serotonin reuptake inhibitors (SSRIs) are among the most efficacious medications for both SAD and BDD (Roy-Byrne & Cowley, 2007; J. Williams, Hadjistavropoulos, & Sharpe, 2006). One study found that changes in social anxiety symptoms were significantly correlated with changes in BDD following fluoxetine treatment for BDD (Pinto & Phillips, 2005). This study recruited 66 outpatients with a DSM-IV primary diagnosis of BDD, who participated in a 12-week randomized controlled trial for fluoxetine versus placebo. Although both the fluoxetine and placebo groups improved significantly following treatment, even after controlling for baseline social anxiety scores, this study was unique in its analysis of the specific correlation between SAD and BDD severity during a pharmacological intervention.

Studies suggest that SAD and BDD can be efficaciously treated with similar psychological and pharmacological treatments, namely CBT and SSRIs. Although data suggest an association between changes in body dysmorphic and social anxiety symptoms during treatment, the question remains whether treatment for individuals with SAD and comorbid BDD may be improved by specifically targeting BDD symptoms. Furthermore, it remains unclear which mechanism of action in CBT produces an effect in the comorbid condition.

Cross-cultural Aspects

In some Eastern cultures, BDD is conceptualized as an offensive subtype of SAD (Lewis-Fernandez et al., 2010). For example, the Japanese conceptualization of SAD is referred to as *taijin kyofusho* (TKS) or literally, “fear of interpersonal relations” in Japanese (Suzuki, Takei, Kawai, Minabe, & Mori, 2003). TKS is similar to SAD in that the patient is primarily concerned with being observed by others and avoids social situations as a result. Both disorders therefore consist of egocentric social fears, or concerns about embarrassing oneself. However, the

offensive subtype of TKS involves concern about offending or embarrassing *others* by acting in various ways, such as blushing, having a deformed physical appearance, staring inappropriately, making improper facial expressions, or having a foul body odor (Kleinknecht, Dinnel, Kleinknecht, & Hiruma, 1997; Lewis-Fernandez et al., 2010). Thus, the offensive subtype of TKS has been described as having an allocentric focus of social fears (Choy, Schneier, Heimberg, Oh, & Liebowitz, 2008). The Western conceptualization of BDD is akin to the offensive subtype of TKS, called *shubo-kyofu*, in which the concern is about offending others due to one's physical deformities (Choy et al., 2008; Lewis-Fernandez et al., 2010; Suzuki et al., 2003). A recent study found that 75% of patients with SAD in the U.S. and Korea reported at least one of the five symptoms of the offensive subtype of TKS (e.g., offending others due to stiff facial expression, body odor, inappropriate staring, intestinal gas, and physical appearance) (Choy et al., 2008). In particular, 37.6% of U.S. participants (N=68) endorsed the TKS symptom related to physical appearance. These data suggest that the offensive subtype of TKS may not be as culturally specific as previously thought, and that there may be some validity to conceptualizing BDD as a social anxiety spectrum disorder.

The culture-bound syndrome known as koro, or *suoyang* (literally, “shrinkage of the penis” in Chinese), also appears to be associated with body dysmorphic and social anxiety symptomatology. Koro is characterized by a fear of genital retraction into the body, at which point the person believes they will die (Bernstein & Gaw, 1990; Cheng, 1996; Levine & Gaw, 1995). It has been conceptualized as a somatoform disorder due to its emphasis on a somatic complaint (Bernstein & Gaw, 1990), and an anxiety disorder due to its associated feature of fear of dying, as in panic disorder (Levine & Gaw, 1995). There have been many case reports of individuals with koro, as well as documented epidemics of koro in Asian countries, which indicate that koro sufferers tend to experience dysmorphic concerns with other body parts and socially anxious concerns (Cheng, 1996; Chowdhury & Bera, 1994). However, there is limited research on the diagnostic overlap between koro, SAD, and BDD. Much of the literature examining the phenomenology of koro has emphasized the social and cultural context in which it occurs, which influences the manifestation of the illness, particularly with regard to social interactions (Cheng, 1996). For example, Cheng describes koro not only as a psychiatric condition, but also as a social phenomenon, in which the patient himself may not initiate the complaint (Cheng, 1996). Indeed, people around him may misinterpret distress as symptoms of koro and perform procedures to “rescue” the retracting organ, which may even occur against the patient's will (Cheng, 1996). Thus, while it seems obvious how such an illness may be associated with social isolation and dysmorphic concern with other body parts, the relationship and interplay between koro, SAD, and BDD is not yet well understood.

Discussion

Similarities between SAD and BDD in phenomenology, cognitive biases, cross-cultural manifestations, and treatment response suggest that these two disorders share common pathological aspects. BDD is defined as a preoccupation with an imagined defect in physical appearance. This concern is likely associated with fear of negative evaluation by others, directly linking it with the defining feature of social anxiety disorder. Our review supports the notion that BDD is a form of anxiety disorder that is closely linked to SAD as well as OCD. Research on the relationship between BDD and SAD is currently far too limited to draw conclusions about whether BDD is more closely related to SAD than OCD. Some evidence indicates that BDD may be more closely related to generalized SAD and those with the additional diagnosis of avoidant personality disorder than individuals from the residual category, as demonstrated by similarities in their high rates of comorbidity with avoidant personality disorder, and similarly high levels of social anxiety symptom severity. In addition, individuals with BDD and generalized SAD share a negative interpretation bias for social information. Future

research should distinguish between the diagnostic subtypes of SAD when examining the relationship to BDD.

Previous conceptualizations of BDD have emphasized its relationship to OCD, body image disorders, psychotic disorders, and other somatoform disorders (Allen & Hollander, 2004; Phillips & Kaye, 2007; Storch et al., 2008). BDD has been identified as a strong candidate for inclusion in the putative obsessive-compulsive spectrum due to findings showing similarities between BDD and OCD in symptomatology, course, onset, comorbidity, neurobiology, familial genetics, and treatment response (Phillips, 2002a; Stein & Lochner, 2006). Despite ostensible similarities in avoidance behavior among individuals with BDD, SAD, and OCD, the locus of concern underlying the avoidance may vary. For BDD, the concern involves public attention to the perceived defect resulting in negative evaluation by others; for SAD, it involves negative evaluation in a social or performance situation for a number of possible reasons; and for OCD, it involves avoidance of situations that trigger the irrational belief (Chosak et al., 2008; Moutier & Stein, 1999). Therefore, differences between the avoidance behaviors of BDD, SAD, and OCD are evident, which may be particularly important for making differential diagnoses.

Limited research has investigated the overlap between BDD and eating disorders, and has suggested that both forms of psychopathology may fall on a continuum of negative body image or body image distortion (Cororve & Gleaves, 2001; Rosen & Ramirez, 1998). Proponents of this view have argued that BDD and eating disorders share a primary concern with physical appearance and body image dissatisfaction and disturbance (Rosen, 2001). Evidence indicates high rates of comorbidity between BDD, eating disorders, and OCD, which partly accounts for observed similarities in intrusive thoughts and ritualistic behaviors in all three disorders (Cororve & Gleaves, 2001; Phillips & Kaye, 2007). There is also compelling evidence that eating disorders such as anorexia nervosa and bulimia nervosa are closely related to OCD from comorbidity and family history studies (Phillips & Kaye, 2007). However, an important limitation of conceptualizing BDD as part of a spectrum of negative body image is that BDD has some important differences from eating disorders. First, patients with BDD tend to have more localized concerns of physical appearance (e.g., skin, hair, and nose), over shape or weight concerns (Cororve & Gleaves, 2001; Hrabosky et al., 2009; Phillips et al., 2010). Secondly, BDD has a fairly equal sex distribution, like OCD, whereas eating disorders are more common among females (Cororve & Gleaves, 2001; Phillips & Kaye, 2007). Third, BDD patients have more negative self-evaluation, more avoidance, and poorer functioning and quality of life due to appearance concerns than eating disorders patients (Hrabosky et al., 2009; Phillips et al., 2010). Finally, eating disorders are typically associated with eating problems, whereas BDD and OCD often occur in the absence of any eating pathology (Phillips & Kaye, 2007). These limitations put into question whether BDD is not better conceptualized as a disorder of body image, and emphasize the need for more research examining the relationship between BDD and eating disorders, as virtually no data currently exist.

BDD has also been conceptualized as a delusional disorder, as it can have both psychotic and nonpsychotic variants (Phillips, 2004). The psychotic variant is currently classified as a delusional disorder, somatic type, in DSM-IV, and is characterized by patients with BDD-related delusions (Phillips, 2004). Delusions in BDD consist of strongly held beliefs that people are laughing at or taking special notice of a perceived appearance defect, as well as referential thinking patterns (Phillips et al., 1993). Research examining the delusional and nondelusional forms of BDD suggests that they may actually be the same disorder, as studies have shown that the two variants are remarkably similar in terms of demographic characteristics, clinical features, comorbidity, and treatment response (Phillips, McElroy, Keck, & Hudson, 1994). Coupled with evidence that the delusional variant of BDD is responsive to serotonin-reuptake inhibitors alone (Phillips, 2002b), and that insight may improve with treatment (Phillips,

McElroy, Dwight, Eisen, & Rasmussen, 2001), it has been suggested that delusional in BDD may be better conceptualized as varying along a dimensional spectrum of insight (Phillips, 2004). The treatment outcome literature in BDD also points to heterogeneous psychotic features in BDD, which are atypical of classic psychotic disorders such as schizophrenia (Phillips, 2004). Therefore, there appears to be greater empirical support for the classification of the delusional variant of BDD as part of BDD, rather than as a separate psychotic disorder.

Across these various conceptualizations, association between BDD and OCD has been the most extensively studied and so far may represent the most tenable conceptualization of BDD. Our review suggests that BDD may also be closely related to SAD, for the same reasons that BDD is strongly associated with OCD. More specifically, evidence indicates that BDD and SAD share similar gender distributions, a similar onset in late childhood and early adolescence, chronic course throughout adulthood, and common clinical features such as poor insight, and risk for suicidal behavior. Furthermore, patients with SAD and BDD share an information processing bias to interpret ambiguous social situations in negative ways (Amir et al., 1998; Buhlmann, Wilhelm, et al., 2002). Individuals with SAD and BDD also appear to benefit from the same treatments, namely CBT and serotonin reuptake inhibitors (Heimberg et al., 1998; Pinto & Phillips, 2005; Veale, Gournay et al., 1996). Research from cross-cultural comparisons between SAD and the offensive subtype of its cultural variant suggest further evidence that BDD may be construed as a social anxiety subtype (Choy et al., 2008).

Recent approaches to the study of psychopathology have taken transdiagnostic perspectives to understanding and treating anxiety disorders and eating disorders (Brown & Barlow, 2009; Fairburn, Cooper, & Shafran, 2003). For example, the transdiagnostic approach in the eating disorders literature suggests that common mechanisms are involved in the maintenance of various forms of eating pathology including anorexia nervosa, bulimia nervosa, and atypical eating disorders (Fairburn et al., 2003). In addition, some research has attempted to identify higher-order dimensional constructs underlying emotional disorders such as positive affect/behavioral activation and negative affect (neuroticism)/behavioral inhibition (Brown & Barlow, 2009). In terms of SAD and BDD, future research should identify shared latent constructs underlying both disorders which may elucidate the mechanisms that play a role in their persistence. For example, if a dimensional construct such as neuroticism underlies all emotional disorders, then sensitivity to rejection and fear of negative evaluation may be strong candidates for indicators of or risk factors for both SAD and BDD. Indeed, some data indicate significantly greater reported levels of fear of negative evaluation by individuals with BDD, as compared to healthy controls (Buhlmann, McNally et al., 2002). Future research is needed to examine the shared aspects of cognitive disturbance in SAD and BDD such as self-focused attention (Hofmann, 2000; Hofmann, Moscovitch, Kim, & Taylor, 2004), which may point to similar maintaining factors of the disorders in some individuals. This could lead to targeted and improved treatment strategies.

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