Appearance Comparison in Individuals with Body Dysmorphic Disorder and Controls

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Abstract

Research investigating appearance comparison in body dysmorphic disorder (BDD) remains very limited, despite the fact that this is one of the most commonly observed behaviors in individuals with the disorder. The present study investigated the self-reported extent and nature of appearance comparison in BDD participants relative to controls using a newly devised and a standardized appearance comparison measure. The results showed that BDD participants reported significantly higher levels of appearance comparison than controls. Individuals with BDD also reported greater levels of comparing in terms of the specific feature(s) of their appearance they were most concerned about as compared to overall appearance, whilst controls showed the opposite pattern. Levels of comparing in BDD participants increased as targets increased in terms of attractiveness, and individuals with BDD rated themselves as being markedly less attractive than targets, and feeling markedly less satisfied with their appearance after comparing. Cognitive-behavioral treatment implications are discussed.

Highlights

- Self-reported appearance comparison in BDD and controls was investigated.
- Levels of appearance comparison were significantly higher in BDD participants.
- BDD participants focused more on disliked features relative to overall appearance.
- Controls focused more on overall appearance relative to disliked features.
- People with BDD were markedly less satisfied with their appearance after comparing.

Keywords: body dysmorphic disorder; appearance comparison; social comparison; body image; cognitive behavior therapy

Introduction

Body dysmorphic disorder (BDD) is characterized by a preoccupation relating to one or more perceived defects or flaws in appearance that are not observable or appear slight to others, which causes significant distress or impairment in functioning (American Psychiatric Association, 2013). One of the most commonly reported and problematic BDD-related behaviors consists of comparison of self to others in terms of physical appearance, either in public or social situations, or in the media (Phillips, 1991; Phillips et al., 2006; Lambrou, Veale, & Wilson, 2012). Indeed, Phillips (2005) observed that "comparing is the most common BDD behavior of all" (p. 106). On the basis of clinical observations, when BDD patients do compare their appearance to others they tend to compare the specific body part that is causing concern with the same body part of others. Phillips (2005) noted that individuals with BDD often judge themselves unfavorably in such comparisons and as a result frequently feel more distressed, and she also pointed out that comparing is time-consuming and can interfere with concentration, particularly when the individual is interacting with others. Veale and colleagues have argued that appearance comparison is one of a number of core problematic behaviors that maintain BDD symptoms by reinforcing selective attention to perceived defects and self-focus on a distorted internal image (Neziroglu, Khemlani-Patel, & Veale, 2008; Veale, 2004; Veale et al., 1996).

Despite the reported high frequency of appearance comparison in BDD, published research investigating this behavior in the disorder is very limited. In one study, which included an investigation of BDD-related behaviors in adults with BDD, Phillips et al. (2006) found that 95.7% of participants reported a lifetime history of comparing their appearance to others, which was the highest percentage reported for the various behaviors investigated in the study. In another study, which investigated the frequency and distress associated with a number of appearance-related behaviors in BDD participants and controls over the past week,

Lambrou et al. (2012) found that individuals with BDD reported a mean frequency of comparing to others of 4.0 (1.2), and a mean level of distress associated with comparing of 3.4 (1.4), on scales ranging from 0 to 5 where higher scores indicated higher levels of comparing and distress respectively. These scores represented the highest levels of frequency and distress associated with the different behaviors investigated in the study. Both of the above studies included a brief investigation of appearance comparison in BDD as part of a wider study, and there have been no published studies, to the authors' knowledge, exploring in more detail the specific nature and effect of this behavior in BDD.

There has, however, been extensive research on appearance comparison in the field of body image, which can guide hypotheses on the nature and effect of appearance comparison in individuals with BDD. It has been proposed by researchers in the field that the comparison process is a core factor in development and maintenance of distorted body image, related maladaptive behaviors and disorder progression (Cash, 1997; Stormer & Thompson, 1996; Thompson, 1996; Thompson, Heinberg, Altabe, & Tantleff-Dunn, 1999).

Theories of appearance comparison developed from social comparison theory (Festinger, 1954), which proposes that people are inclined to self-appraise their traits and commonly examine others in contexts relevant to themselves, drawing comparisons to inform self-evaluation. Research into social comparison suggests that comparison targets tend to be "particularistic", involving comparison on the basis of distinct similarity to the target in terms of characteristics or attributes, for example

someone of the same age or sex (Festinger, 1954; Miller, Turnbull, & McFarland, 1988; Wood, 1989). These authors have also noted that comparisons can be "upward", comparing the self to someone perceived as "better-off", or "downward", comparing the self to someone perceived as "worse-off". In addition, theories of social comparison suggest that the tendency to compare, as well as the impact of the comparing process, may be higher

depending on the importance and self-relevance to the individual of the dimension under comparison (see Wood, 1989, for a review).

Research studies in the area of body image have found that greater levels of appearance comparison are associated with higher levels of body dissatisfaction (Heinberg & Thompson, 1992; Thompson, Heinberg, & Tantleff, 1991). Furthermore, a higher frequency of upward comparisons has been found to be associated with more negative appearance evaluation and body dissatisfaction (Bailey & Ricciardelli, 2010; Leahey, Crowther, & Mickelson, 2007; Myers & Crowther, 2009; Stormer & Thompson, 1996; Tantleff-Dunn & Gokee, 2002). Consistent with the above associations, Leahey et al. (2007) also found that women with high body dissatisfaction, as compared to those with low body dissatisfaction, engage in a greater number of comparisons overall, as well as a higher proportion of upward comparisons.

Given the reported frequency of appearance comparison in BDD, and the wealth of research evidence indicating that this process is a core factor in the development and maintenance of body dissatisfaction, the aim of this study was to investigate the self-reported extent and nature of appearance comparison in individuals with BDD relative to controls. Specifically, the study aimed to explore self-reported frequency of comparing to same sex targets in terms of overall appearance and specific feature(s)/body part(s) of concern, as well as the frequency of comparing to same sex targets in terms of level of attractiveness. A further objective of the study was to explore individuals' ratings of the attractiveness of targets in comparison to themselves, and the effect of appearance comparison on body satisfaction. The above factors were explored using a new measure of self-reported appearance comparison, as well as a standardized appearance comparison measure. The purpose of devising a new measure was to investigate specific components of appearance comparison in BDD as part of an exploratory study, rather than to develop and validate a new

measure in itself. A new scale was devised, as there was no published scale at the time of conducting the research, to the authors' knowledge, specifically investigating these components.

The hypotheses were as follows: (1) In comparison to controls, BDD participants would report higher levels of appearance comparison to same sex targets in terms of both overall appearance and specific features/body parts of concern; (2) Reported frequency of appearance comparison to same sex targets would be higher in terms of specific features/body parts of concern as compared to overall appearance in BDD participants, with the opposite pattern occurring in controls; (3) In terms of both overall appearance and specific features/body parts of concern, frequency of comparing to same sex targets in both groups would be higher for attractive targets in comparison to average targets, and higher for average targets in comparison to unattractive targets; (4) Attractiveness ratings of self compared to same sex others would be significantly more negative in BDD participants as compared to controls for all types of target (general and attractive); (5) Changes in appearance satisfaction following comparison to same sex targets would be more negative for BDD participants as compared to controls for all types of target (general and attractive); (6) BDD participants' frequency of comparing to same sex targets in terms of both overall and specific features of appearance would be positively correlated with BDD severity; and (7) In both groups, frequency of comparing to same sex targets (in terms of both overall and specific features of appearance) would be positively correlated with levels of appearance orientation, and negatively correlated with the following: levels of appearance evaluation and satisfaction, self-ratings of attractiveness in comparison to others, and appearance satisfaction following comparing.

Method

Participants

BDD participants were obtained from the following sources: current and former in-patients, out-patients and day-patients who had been assessed and/or treated at a National Health Service Mental Health Foundation trust in London, U.K. or at an independent psychiatric hospital in London, U.K.; individuals attending a monthly support group for people with BDD in London, U.K.; and volunteers responding to newsletter or online advertisements. Control participants comprised volunteers identified through a volunteer database organized by a university in London, U.K., volunteers responding to circular emails sent to students and staff at the university, people responding to leaflets delivered to properties located near the university, and non-clinical staff at the independent psychiatric hospital described above.

Inclusion criteria for BDD participants included the following: fulfilling DSM-IV diagnostic criteria, which was assessed for using the Structured Clinical Interview for DSM-IV Axis 1 Disorders, Patient Edition (SCID-1/P; First, Spitzer, Gibbon, & Williams, 1996); scoring 24 or above on the Yale-Brown Obsessive Compulsive Scale for Body Dysmorphic Disorder (BDD-YBOCS; Phillips et al., 1997); and having primary body image concerns that were not weight- or shape-related. Three BDD participants were not administered the BDD-YBOCS. The SCID-1/P was not used to establish a diagnosis of other Axis 1 disorders.

Inclusion criteria for controls included the absence of a diagnosis of BDD, which was screened for using the Body Dysmorphic Disorder Questionnaire (BDD-Q; Phillips, Atala, & Pope, 1995), and no history of other mental health problems, which was screened for by excluding participants who had ever consulted a medical or mental health professional about a personal mental health problem. General inclusion criteria for both groups included being aged 17 or over, and having a sufficient level of English to understand the information and instructions relating to the study, as well as the rating scales and questionnaires.

Participants comprised 35 individuals (16 men and 19 women) with a DSM-IV diagnosis of BDD, and 45 controls (22 men, 23 women). The groups did not differ significantly in terms of sex, $x^2 = 0.08$, $p = .778$. General linear model (GLM) one-way analysis of variance (ANOVA) revealed that the BDD ($M = 32.88$, $SD = 10.88$) and control groups ($M = 30.56$, $SD = 8.23$) did not differ in mean age, $F(1, 77) = 1.17$, $p = .282$, $\eta^2 = .01$.

Measures

Body dysmorphic symptoms. The Body Dysmorphic Disorder Questionnaire (BDD-Q; Phillips et al., 1995) is a brief screening measure for BDD, based on DSM-IV diagnostic criteria, which can be completed either by self-report or by an interviewer. The instrument assesses whether an individual is preoccupied with a particular aspect of their appearance that they consider especially unattractive, and if so whether this is mainly related to weight/shape concerns. The BDD-Q has been found to have high levels of specificity, and very high levels of sensitivity (Phillips et al., 1995).

The Yale-Brown Obsessive Compulsive Scale for Body Dysmorphic Disorder (BDD-YBOCS; Phillips et al., 1997) is a 12-item clinician-administered measure of the severity of BDD symptoms over the past week. Items are rated on a scale from 1 to 4, with higher scores indicating greater BDD symptomatology. Scores range from 0 to 48. The measure has been found to have good levels of inter-rater reliability, test-retest reliability, and internal consistency, and the authors also reported evidence of the scale's convergent and discriminant validity (Phillips et al., 1997). Internal consistency (Cronbachs alpha) of the BDD-YBOCS for the BDD group in this study was acceptable ($\alpha = .78$). The measure was not administered to individuals in the control group, since the questions are based upon the assumption that an individual experiences a significant preoccupation with some aspect of his or her appearance, as determined by the BDD-Q.

Body image. The Multidimensional Body-Self Relations Questionnaire – Appearance Scales (MBSRQ-AS; Cash, 2000) is a widely used 34-item self-report measure assessing evaluative, cognitive and behavioral components of body image. The questionnaire contains the following five subscales: Appearance Evaluation (AE); Appearance Orientation (AO; relating to investment in, and importance attached to appearance); Body Areas Satisfaction Scale (BASS); Overweight Preoccupation (OWP); and Self-Classified Weight (SCW). Each item is rated on a five-point scale, and a mean rating for each subscale (ranging from 1-5) is calculated by dividing the sub-total for each subscale by the number of subscale items. Higher scores on the AE and BASS subscales indicate greater levels of evaluation and satisfaction associated with appearance, whilst higher scores on the AO, OWP and SCW subscales are indicative of greater investment in/importance attached to appearance, greater levels of weight-related preoccupation and higher perceptions of being overweight respectively. The subscales have been found to have acceptable levels of internal consistency and test-retest reliability, and the full scale has demonstrated high levels of convergent, discriminant and construct validity (Cash, 2000; Cash, Counts, Hangen, & Huffine, 1989). In this study, internal consistency for the AE subscale was adequate for the control group (α = .75), but weaker for the BDD sample (α = .67). Internal consistency for the remaining subscales in this study was acceptable to good, as follows: AO (BDD group: α = .75; controls α = .90); BASS (BDD group: α = .77; controls: α = .77); OWP (BDD α = .89; controls: α = .83; and SCW (BDD group: α = .87; controls: α = .80).

Appearance comparison. The Body Comparison Scale (BCS; Fisher, Dunn, & Thompson, 2002) is a 36-item self-report questionnaire assessing the frequency of comparing the appearance of specific body sites to the same body sites of other same-sex individuals, as well as general tendencies to engage in appearance comparison. Items are rated on a 5-point scale, and the total score ranges from 36 to 180, with higher scores indicating greater

frequency of appearance comparison. The scale was found to have good internal consistency (Fisher et al., 2002). In this study, the internal consistency of the BCS was excellent for both the BDD (α = .94) and control groups (α = .94).

The Appearance Comparison Inventory (ACI) is a new scale designed for the present study to investigate the nature and extent of people's comparison of their own physical appearance to the physical appearance of others: A copy of the ACI is available in a Supplementary Materials document linked to this electronic article. The present study describes the results of the following five sub-groups of items of the ACI investigating same-sex comparisons, which comprise 14 items in total: (1) overall frequency of comparing, in terms of: (a) appearance as a whole; (b) specific feature(s)/body part(s) of concern; (2) frequency of comparing associated with the overall attractiveness level of the target: (a) attractive; (b) average; (c) unattractive; (3) frequency of comparing associated with the attractiveness level of the target in terms of the specific feature(s)/body part(s) of concern to the participant: (a) attractive; (b) average; (c) unattractive; (4) rating of the attractiveness of targets in comparison to self: (a) targets in general; (b) targets considered attractive (overall); (c) targets considered attractive (in terms of the participant's feature(s)/body part(s) of concern); and (5) the effect of appearance comparison on body satisfaction: (a) targets in general; (b) targets considered attractive (overall); (c) targets considered attractive (in terms of the participant's feature(s)/body part(s) of concern).

It was felt that these sub-groups of ACI items represent the most clinically relevant aspects of comparing in BDD, given the emphasis on preoccupation relating to specific features in the diagnostic description of the disorder (American Psychiatric Association, 2013), as well as the evidence from the appearance comparison literature regarding association between levels of comparing to same-sex targets, particularly to more attractive targets, and body dissatisfaction. The ACI also includes a further three sub-groups of items

(comparing in different situations, and comparing in terms of age and familiarity of targets). In addition, for all eight sub-groups of items, the ACI also includes questions asking about comparing to opposite sex targets. The results of these items are not included in the present study, as they were not the main focus of the research.

In terms of the instructions and scoring for the ACI, for the first three sub-groups of items, participants were asked how often they compared their physical appearance to the physical appearance of the specific group of men/women described (e.g., *men you consider attractive in terms of overall physical appearance*) using an analogue percentage scale ranging from 0% (*none of the time*) to 100% (*all of the time*). For the fourth sub-group of items, participants were asked how they generally rated/judged the physical attractiveness of men/women in comparison to their own physical attractiveness using an analogue rating scale ranging from 0 (*much less attractive than me*) to 100 (*much more attractive than me*). For the fifth sub-group of items, participants were asked how much more or less satisfied with their physical appearance they generally felt after comparing to the physical appearance of men/women using an analogue rating scale ranging from 0 (*much less satisfied*) to 100 (*much more satisfied*). Participants were not asked to base their responses on any particular time frame, in order that the responses were not affected or restricted by any particular factors specific to this time period.

Construct validity of the ACI was investigated by comparing BDD and control participants in terms of scores for the following core questionnaire items: frequency of comparing to same sex targets in terms of overall appearance and specific feature(s) of concern, ratings of same sex targets (in general) in comparison to self, and effect of comparison to same sex targets (in general) on appearance satisfaction. Hochberg-Improved Bonferroni between group comparisons revealed significant differences between BDD and control participants for scores on all four variables, (comparing to targets in terms of overall

appearance: $t(77) = 8.19$, $p = .001$; comparing to targets in terms of specific feature(s) of concern: $t(78) = 11.13$, $p = .001$; rating of appearance of targets in comparison to self: $t(76) = 9.21$, $p = .001$; and appearance satisfaction after comparing to targets: $t(75) = -6.52$, $p = .001$).

In order to investigate criterion (concurrent) validity of the content of the ACI, Pearson product moment correlations of the four core questionnaire items described above with the BCS, and the AE, AO, and BASS subscales of the MBSRQ-AS were calculated for participants as a whole (see Table 1). As would be expected, both of the ACI items exploring frequency of comparison correlated highly with BCS scores, and also correlated highly with the above MBSRQ-AS subscales. ACI items exploring comparative ratings and the effect of comparing on satisfaction correlated particularly highly with the AE and BASS scores.

Internal consistency for the 14 ACI items included in the study results was measured using Cronbach's alpha. Scores for appearance satisfaction after comparing were reversed to make the direction of scoring consistent with scores for the remaining items. The ACI had a high level of internal consistency, (total sample: $\alpha = .96$; BDD group: $\alpha = .91$; controls: $\alpha = .90$).

Symptoms of anxiety and depression. The Hospital Anxiety and Depression Scale (HADS; Zigmond & Snaith, 1983) is a widely used 14-item self-report measure assessing the severity of current symptoms of depression and anxiety. The depression (HADS-D) and anxiety (HADS-A) subscales each have seven items, rated on a scale from 0 to 3, with the total possible score for each subscale ranging from 0 to 21. Higher scores on each subscale indicate higher levels of symptom severity. The HADS has demonstrated good internal consistency and test-retest reliability (Savard, Laberge, Gauthier, Ivers, & Bergeron, 1998), although the internal consistency of the HADS-D in this study was somewhat low for both groups, (BDD:

α = .69); controls: (α = .66). For the HADS-A, however, the internal consistency in this study was acceptable for both the BDD (α = .76) and control groups (α = .78).

Procedure

Ethical approval for the study was obtained from the Ethics Committees of the National Health Service Mental Health Foundation trust and the independent psychiatric hospital from where participants were recruited. Participants were seen in person and provided informed consent once they had been given full explanation of the procedures. They then self-completed the questionnaires. BDD participants were additionally administered the SCID-1/P and BDD-YBOCS by the first author, who is a qualified clinical psychologist. Controls were seen either by the first author, or a psychology research assistant.

Results

Measures of Depression, Appearance Comparison, and Body Image

In order to compare the BDD and control group on the HADS-D, HADS-A, MBSRQ-AS, and BCS, GLM one-way between groups ANOVAs were performed. Table 2 shows the mean scores for each group and the results of the ANOVAs. BDD participants, as expected reported significantly higher levels of depression and anxiety than controls on the HADS-D and HADS-A respectively. On the BCS people with BDD, as expected, reported comparing their appearance to same sex others significantly more frequently than controls. On the MBSRQ-AS, as would be expected, BDD participants obtained significantly lower scores than controls on the AE and BASS subscales, and higher scores than controls on the AO and OWP subscales. The groups did not differ significantly on the SCW subscale of the MBSRQ-AS.

Appearance Comparison Inventory (ACI)

Analysis. Two-way mixed ANOVAS were conducted for each item on the ACI, with group as the between groups factor and item (e.g., attractiveness of target) as the within

groups factor. Significant group by item interactions were further investigated using planned contrasts (for items containing three or more levels) and Hochberg-Improved Bonferroni post hoc pairwise tests. Table 3 shows mean scores for ACI items for each group and the results of the ANOVAs.

Comparison to targets in terms of overall appearance/specific features. The two-way (Body Perspective (overall/specific features of concern) x Group) ANOVA showed a main effect of Group. Inspection of the mean scores shows that, as predicted, frequency of comparing to same sex targets in terms of both overall appearance and specific feature(s) of concern was markedly higher in BDD participants than controls. There was no main effect of Body Perspective, but the interaction between Body Perspective (overall/specific) and Group was significant. As hypothesized, for the BDD group, post hoc pairwise tests showed that BDD participants reported spending significantly more time comparing their appearance in terms of specific feature(s) of same sex targets as compared to overall appearance (p = .018) whilst control participants, in contrast, reported spending significantly more time comparing their appearance in terms of the overall appearance of same sex targets as compared to specific features (p = .014).

Comparing to targets in terms of level of overall attractiveness. The two-way (Attractiveness-Overall x Group) ANOVA investigating levels of appearance comparison to same sex targets varying in terms of overall attractiveness showed a main effect of Group and Attractiveness-Overall, and there was also a significant interaction between Attractiveness-Overall and Group. Planned simple contrasts showed significant interactions when BDD and control scores were compared for both unattractive compared to average targets, $F(1, 78) = 9.93$, p = .002, and average compared to attractive targets, $F(1, 76) = 4.95$, p = .029. For the BDD group, as predicted, post hoc pairwise tests revealed that scores for attractive targets were significantly higher than scores for average targets (p = .001), and in turn scores for

average targets were significantly higher than scores for unattractive targets (p = .001). In the control group, as hypothesized, pairwise tests revealed that scores for attractive targets were significantly higher than scores for average (p = .001) and unattractive targets (p = .001). However, in contrast to the hypotheses, there was no significant difference between scores for average and unattractive targets in the control group (p = .062).

Comparing to targets in terms of level of attractiveness of specific features. The two-way (Attractiveness-Specific x Group) ANOVA investigating levels of appearance comparison to same sex targets varying in terms of the attractiveness of the participant's specific feature(s) of concern showed a significant main effect of Group, and Attractiveness-Specific but the interaction between Attractiveness-Specific and Group was not significant. Planned simple contrasts revealed that for the sample as a whole, as hypothesized, appearance comparison scores for attractive targets were significantly higher than scores for average targets, $F(1, 76) = 29.58$, $p < .001$, and in turn scores for average targets were significantly higher than scores for unattractive targets, $F(1, 76) = 8.33$, $p = .005$.

Rating of the attractiveness of targets in comparison to self. The two-way (Rating x Group) ANOVA showed a main effect of Group. Examination of the mean scores in Table 3 indicates that when comparing their appearance to same sex others, BDD participants rated themselves as markedly less attractive than all target types (i.e., targets in general, targets considered attractive in terms of overall appearance, and targets considered attractive in terms of the participant's specific feature(s) of concern). Controls, on the other hand rated themselves as similar in attractiveness to targets in general, and only slightly less attractive than both targets considered attractive in terms of overall appearance, and targets considered attractive in terms specific feature(s) of concern. These results are consistent with the hypotheses. There was a significant main effect of Rating, but the Rating by Group interaction was non-significant. Planned repeated contrasts indicated that for the sample as a

whole, as predicted, participants' ratings of their own attractiveness in comparison to others were lower for attractive (overall) targets compared to targets in general, $F(1, 75) = 27.00$, $p < .001$, and in turn were lower for attractive (specific) compared to attractive (overall) targets, $F(1, 74) = 8.18$, $p = .005$.

Effect of comparing on appearance satisfaction. The two-way (Satisfaction x Group) ANOVA showed a main effect of Group. Examination of the mean scores in Table 3 indicates that BDD participants reported feeling markedly less satisfied with their appearance after comparing their appearance to all same sex target types (i.e., targets in general, targets considered attractive in terms of overall appearance, and targets considered attractive in terms of the participant's specific feature(s) of concern). Controls, on the other hand, reported no marked change in appearance satisfaction after comparing to targets in general, and being only slightly less satisfied with their appearance after comparing to both targets considered attractive in terms of overall appearance, and targets considered attractive in terms of participant's specific feature(s) of concern. These results are in line with predictions. There was a significant main effect of Satisfaction, but the Satisfaction by Group interaction was non-significant. Planned repeated contrasts indicated that for the sample as a whole, reductions in appearance satisfaction, as hypothesized, were greater for attractive (overall) targets compared to targets in general, $F(1, 75) = 24.43$, $p < .001$, but that the amount of reduction in appearance satisfaction, in contrast to predictions, did not differ between attractive (specific) and attractive (overall) targets $F(1, 75) = 2.70$, $p = .104$.

Correlational analysis. Correlations were performed to investigate the association between frequency of comparing and the following: BDD severity (in BDD participants); AE, AO, and BASS scores on the MBSRQ-AS (in both groups); and self-ratings of attractiveness in comparison to others, and appearance satisfaction following comparing on the ACI (in both groups).

For BDD participants, as hypothesized, the frequency of comparing to the overall appearance of same sex others on the ACI was positively correlated with BDD-YBOCS scores, MBSRQ-AS AO scores, and ratings of the attractiveness of others in general compared to self on the ACI, and negatively correlated with MBSRQ-AS AE and BASS scores, and appearance satisfaction after comparing to others in general on the ACI (See Table 4). As predicted, frequency of comparing in terms of specific feature(s) of concern on the ACI was positively correlated with ratings of the attractiveness of others in general compared to self on the ACI, and negatively correlated with MBSRQ-AS AE scores, and appearance satisfaction after comparing to others in general on the ACI. However, in contrast to predictions, the frequency of comparing in terms of specific feature(s) of concern was not significantly correlated with BDD-YBOCS scores, or MBSRQ-AS AO or BASS scores. For BDD participants, BCS scores, as hypothesized, were negatively correlated with MBSRQ-AS BASS scores, and appearance satisfaction after comparing to others in general on the ACI. However, in contrast to predictions, BCS scores were not significantly correlated with BDD-YBOCS scores, MBSRQ-AS AE or AO scores, or ratings of the attractiveness of others in general compared to self on the ACI

For controls, as hypothesized, levels of comparing in terms of both overall appearance and specific feature(s) of concern on the ACI were positively correlated with MBSRQ-AS AO scores, but in contrast to the hypotheses were not correlated with other MBSRQ-AS subscale scores, appearance satisfaction after comparing to others in general on the ACI, or ratings of the attractiveness of others in general compared to self on the ACI. For controls, BCS scores, in contrast to predictions, were not correlated with any MBSRQ-AS subscale scores, appearance satisfaction after comparing to others, or ratings of the attractiveness of others in general compared to self on the ACI.

Discussion

This study investigated self-reported appearance comparison in individuals with BDD and controls using a new measure, the ACI, and a standardized measure, the BCS (Fisher et al., 2002). The results of the ACI showed that as expected, BDD participants, when in public or social situations, or when viewing media images, report spending an extensive proportion of their time comparing their appearance to others of the same sex, in terms of both overall appearance and specific feature(s) of concern. Individuals with BDD also reported high levels of comparing on the BCS. These findings are consistent with the results of the studies of Phillips et al. (2006), who found that lifetime comparing was the BDD-related behavior reported by the highest percentage of individuals with BDD, and Lambrou et al. (2012), who found that comparing was the appearance-related behavior most frequently reported over the past week in individuals with BDD. The results are also in line with research in the field of body image, which has found that greater levels of appearance comparison are associated with higher levels of body dissatisfaction (Heinberg & Thompson, 1992; Myers & Crowther, 2009; Stormer & Thompson, 1996; Thompson et al., 1991).

As hypothesized, BDD participants reported significantly higher levels of appearance comparison than controls on both the ACI and the BCS. Furthermore, on the ACI, BDD participants, as hypothesized, reported spending significantly more time comparing to others in terms of the feature(s) of their appearance they were most concerned about as compared to their overall appearance, whilst controls showed the opposite pattern. In line with clinical observations in the literature (e.g., Buhlmann, Etcoff, McNally, Tuschen-Caffier, & Wilhelm, 2004; Phillips 1991; Phillips, McElroy, Keck, Pope, & Hudson, 1993; Veale et al., 1996), and the diagnostic definition of the disorder (American Psychiatric Association, 2013), these findings suggest that BDD patients are characterized by a disproportionately high level of focus on specific features of appearance in comparison to looks as a whole.

With regard to the attractiveness of targets, reported levels of comparing in BDD participants, as predicted, increased significantly as targets increased in terms of level of both overall attractiveness, and the attractiveness of the specific features(s) that the participant was concerned about. This finding is consistent with studies investigating appearance comparison in body image, which have found that a higher frequency of upward comparisons is associated with more negative appearance evaluation and body dissatisfaction (Bailey & Ricciardelli, 2010; Leahey et al., 2007; Tantleff-Dunn & Gokee, 2002).

When comparing their appearance to all same-sex target types (i.e., targets in general, targets considered attractive in terms of overall appearance, and targets considered attractive in terms of the participant's specific feature(s) of concern), BDD participants, as hypothesized, rated themselves as being markedly less attractive than the target, and feeling markedly less satisfied with their appearance. These findings are consistent with the observation by Phillips (2005) that BDD sufferers often judge themselves unfavorably in comparison to others, and frequently feel more distressed after comparing to others. The findings are also in line with the results of Lambrou et al. (2012) who reported that comparing was the appearance-related behavior associated with most distress over the past week in individuals with BDD.

For BDD participants, as predicted, the level of self-reported comparing to the overall appearance of same sex others on the ACI was significantly correlated with all the key relevant measures investigated, as follows: positive correlations with BDD severity on the BDD-YBOCS, MBSRQ-AS AO scores, and ratings of the attractiveness of others in general compared to self on the ACI; negative correlations with MBSRQ-AS AE and BASS scores, and appearance satisfaction after comparing to others in general on the ACI. These findings are consistent with the results of correlational studies conducted by body image researchers, which have consistently found an association between individual tendencies to compare their

appearance to others and body dissatisfaction (Heinberg & Thompson, 1992; Myers & Crowther, 2009; Stormer & Thompson, 1996; Thompson et al., 1991).

In terms of specific feature(s) of concern, BDD participants' level of comparing on the ACI was positively correlated with ratings of the attractiveness of others in general compared to self on the ACI, and negatively correlated with MBSRQ-AS AE scores, and appearance satisfaction after comparing to others in general on the ACI. However, in contrast to predictions, BDD participants' level of comparing in terms of specific feature(s) of concern was not correlated with MBSRQ-AS AO or BASS scores or BDD-YBOCS scores. One possible explanation is that the former two scales are focused on overall appearance and/or a number of appearance features; however, this would not explain why comparing in terms of specific feature(s) of concern was not correlated with scores on the BDD-YBOCS (which focuses particularly on specific feature(s) of concern), but was correlated (negatively) with scores on the MBSRQ-AS AE subscale (which focuses on appearance as a whole).

For BDD participants, BCS scores, as hypothesized, were positively correlated with MBSRQ-AS BASS scores, and appearance satisfaction after comparing on the ACI, but contrary to predictions BCS scores were not significantly correlated with other measures. It is suggested that the absence of a significant correlation with the BDD-YBOCS may be due to the fact the BCS investigates comparing to a range of different body parts. Nevertheless, this would not explain why BCS scores were not correlated with MBSRQ-AS AE and AO scores, which focus on appearance as a whole. It is felt that further research investigating association between core components of body dissatisfaction in BDD, and levels of comparing in terms of overall, as well as specific features of concern would be of benefit in further understanding the role of comparing in contributing to BDD symptoms.

Conclusions

It is suggested that the present findings provide support for cognitive models of BDD (Neziroglu et al., 2008; Veale, 2004), which suggest that appearance comparison is one of a number of core problematic behaviors that contribute to the persistence of BDD symptoms. It is proposed that this behavior, particularly comparing in terms of specific body parts, and upward comparison, may contribute to the maintenance of BDD through the following processes: (1) heightening appearance-related focus and preoccupation; (2) contributing to self-focused attention, since individuals may shift attention between the comparison target, and their own internal image (Osman, Cooper, Hackmann, & Veale, 2004); (3) reinforcing selective focus on their the specific disliked body part, resulting in a heightened awareness and relative magnification of the perceived defect; and (4) contributing to an unrepresentative and biased view of the appearance of others as a whole, and an unrealistic ideal (Veale, Kinderman, Riley, & Lambrou, 2003).

However, it is also suggested that consideration of reported appearance comparison behaviors in controls is of relevance in understanding the potential role of such behaviors in maintaining preoccupation with appearance in BDD. When given the opportunity, controls reported spending a considerable proportion of their time comparing to the overall appearance of same sex targets. Controls also reported a tendency to engage in upward comparisons to attractive targets. Despite these reported behaviors, levels of appearance evaluation and satisfaction were relatively high in control participants, and appearance comparison was not accompanied by marked negative comparative evaluations or significant reductions in body satisfaction. Moreover, for controls, levels of comparing in terms of both overall and specific feature(s) of concern on the ACI were positively correlated with MBSRQ-AS AO scores, but levels of comparing on the ACI and the BCS were not correlated with other relevant ACI or MBSRQ-AS scores. Taken together, these results suggest that

appearance comparison may not necessarily be a dysfunctional behavior, unless it is: (1) excessive in frequency; and/or (2) is accompanied significant body dissatisfaction.

Treatment Implications

It is felt that the findings of the present study further highlight the importance of focusing on psychological strategies aimed at helping individuals with BDD to resist comparing their appearance to others as part of psychological treatment for the disorder. Cognitive behavioral therapy (CBT) strategies aimed at helping BDD patients reduce excessive appearance comparison have been outlined (e.g., Neziroglu et al., 2008; Wilhelm, 2006), and although the evidence base for CBT in BDD is limited, the recommendations of two meta-analyses have found that CBT is more effective than wait list control (NICE, 2005; Williams, Hadjistavropoulos, & Sharpe, 2006). In addition, a recent randomized controlled trial found that CBT was significantly superior to anxiety management in reducing BDD symptoms at 12 weeks (Veale et al., 2014). In terms of specific strategies, Neziroglu et al. (2008) propose that treatment aimed at helping BDD patients reduce excessive appearance comparison can include encouragement to extend their range of attention, for example by focusing their attention on all the sensory stimuli in their surrounding environment, by concentrating on the content of conversations during social interactions, and by attending to the whole of a person's appearance, rather than specific features. CBT interventions to address maladaptive appearance comparison behaviors have also been described in the literature on body image (Cash, 2008). Cash's program includes strategies such as self-monitoring, as well as corrective statements that help individuals to reduce their tendency to evaluate their appearance in terms of an unrealistic or extreme standard.

Limitations

The study had a number of limitations. A significant limitation was the non-inclusion of a relevant clinical control group, given that elevated levels of social comparison may be

evident in individuals who experience general negative self-and perceived other evaluations (Gilbert, 2000; Gilbert, Price, & Allan, 1995). Two further significant limitations were the failure to assess BDD participants for comorbid Axis 1 diagnoses, as it is possible that for some participants, differences from controls in any of the dependent variables being investigated may have been influenced by comorbid diagnoses, and the failure to conduct structured assessment of control participants using the SCID -1/P.

Another limitation concerns the development of the ACI. Even though the purpose of devising this new measure was to investigate specific components of appearance comparison in BDD as part of an exploratory study, rather than to develop and validate a new measure in itself, establishing the measure's re-test reliability, and performing factor analysis to examine its factor structure and factorial validity would have been of benefit . The new scale was devised because there is no published scale, to the authors' knowledge, specifically investigating the areas being explored in the present study. A new 11-item measure, The Physical Appearance Comparison Scale - Revised (PACS-R), was recently developed by Schaefer and Thompson (2014). This scale was not available at the time the present study was conducted. Moreover, although there is some similarity in item content to the ACI, the PACS-R does not investigate the specific areas investigated in the present study, and it focuses primarily on comparing in terms of weight/shape.

A further limitation of the study is that measurement of the frequency of appearance comparison was based on retrospective self-reporting of the proportion of time spent comparing. This is clearly subject to potential inaccuracies relating to memory and estimation of focus of attention.

Future Research

It is suggested that future studies using multiple regression methodology would be of benefit in further investigating appearance comparison in BDD. It would also be of benefit to

explore the reported functions of comparing. In addition experimental studies as well as designs using implicit measures of appearance comparison would be of benefit. It is also suggested that further research investigating appearance comparison in BDD could use other forms of measurement to address issues relating to retrospective self-report. This could include the use of ecological momentary assessment (EMA), as described by Leahy et al. (2007), and Leahey and Crowther (2008). In these studies, participants completed diary recordings of the frequency, direction (upward or downward), and impact of appearance-focused comparisons on a number of occasions each day. The authors noted that this form of measurement provides a more ecologically valid means of recording, enabling generalization of findings to real-life settings. This form of recording also provides a more immediate means of measurement, reducing the reliance on retrospective memory. In addition, it would also be of benefit to include a measure of general social comparison, in order to explore to what extent increased levels of appearance comparison may be the result of an increased tendency to compare to others in terms of a range of characteristics

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Table 1

Pearson product moment correlations of ACI items with BCS and MBSRQ-AS for the sample as a whole (BDD and Controls).

ACI	BCS	MBSRQ-AS		
		Appearance Evaluation	Appearance Orientation	Body Areas Satisfaction
Comparison to targets – Overall	.674**	-.573**	.675**	-.608**
Comparison to targets– Specific features of concern	.662**	-.635**	.707**	-.634**
Rating of targets – Targets in general	.480**	-.746**	.476**	-.683**
Satisfaction – Targets in general	-.471**	.674**	-.395**	.602**

** $p < .001$

Table 2

Mean age, HADS-D, HADS-A, BDD-YBOCS, BCS and MBSRQ-AS scores, and ANOVAs comparing groups on each measure

	BDD		Controls		Group [a]	
	M	*SD*	*M*	*SD*	*F*	Partial η^2
HADS – D	9.53	3.37	1.42	1.67	194.19**	.72
HADS – A	13.72	3.57	4.70	2.83	153.28**	.67
BDD-YBOCS [b]	33.59	5.60	-	-	-	-
BCS	110.39	28.30	80.43	19.57	29.31**	.29
MBSRQ-AS						
Appearance Evaluation	2.06	0.70	3.53	0.58	106.48**	.59
Appearance Orientation	4.29	0.55	3.19	0.78	53.89**	.41
Body Areas Satisfaction	2.40	0.67	3.48	0.54	64.25**	.45
Overweight Preoccupation	3.04	1.33	2.01	0.92	16.51**	.17
Self-Classified Weight	3.31	0.94	3.03	0.63	2.54	.03
Degrees of freedom					(1, 73) to (1, 78)	

[a] A one-way between groups ANOVA was performed for each measure
[b] BDD-YBOCS was not administered to Controls
** $p < .001$

Table 3

ACI: Mean scores for comparison to same sex targets in terms of various characteristics, ratings of targets in comparison to self, and appearance satisfaction following comparing

Characteristic	BDD		Controls		Group [a]		Characteristic [a]		Group x Charact. [a]	
	M	*SD*	*M*	*SD*	*F*	Partial η^2	*F*	Partial η^2	*F*	Partial η^2
Body Aspect[b]					85.68**	.53	0.00	.00	13.21**	.15
Overall	88.07	16.95	44.55	29.67						
Specific	93.86	12.30	38.44	30.34						
Attractiveness - Overall[b]					59.69**	.43	60.78**	.44	9.95*	.11
Unattractive	53.86	35.31	23.89	22.84						
Average	69.86	28.09	28.44	22.28						
Attractive	89.21	16.35	38.83	28.75						
Attractiveness - Specific[b]					101.32**	.57	26.97**	.26	2.60	.33
Unattractive	70.50	31.02	23.02	23.45						
Average	78.14	24.17	26.36	25.07						
Attractive	91.93	13.17	34.09	30.66						
Ratings of target[c]					121.58**	.62	30.85**	.29	1.63	.02
In general	82.07	16.84	47.33	16.34						
Attractive-overall	88.23	16.22	59.94	17.68						
Attractive-specific	93.07	15.84	61.92	18.30						
Satisfaction[d]					116.80**	.61	24.53**	.25	1.21	.02
In general	22.87	22.71	50.93	12.01						
Attractive-overall	12.06	15.71	43.84	13.37						
Attractive-specific	9.19	11.83	42.33	13.77						
Degrees of freedom					(1, 75) to (1, 78)		Body Aspect (1, 77); Other items (2, 75) to (2, 78)			

[a] A two-way mixed ANOVA was performed for each sub-group of items on the ACI, with group as the between groups factor, and characteristic/target type as the within groups factor

[b] Scores range from 0 (none of the time) -100 (all of the time)

[c] Scores range from 100 (much more attractive than me) to 0 (much less attractive than me)

[d] Scores range from 100 (much more satisfied) to 0 (much less satisfied)

** $p < .001$ * $p < .01$

Table 4

Pearson product moment correlations of BCS and core ACI items with BDD-YBOCS, MBSRQ-AS, and Rating and Satisfaction items on the ACI for each group

Measure		BDD			Controls		
		BCS	ACI: Overall	ACI: Specific	BCS	ACI: Overall	ACI: Specific
BDD-YBOCS		.292	.458**	.305	-	-	-
MBSRQ-AS							
	Appearance Evaluation	-.419*	-.391*	-.341*	-.075	-.021	-.096
	Appearance Orientation	-.005	.376*	.237	.251	.460**	.511***
	Body Areas Satisfaction	-.656***	-.400*	-.198	-.236	-.264	-.335*
ACI							
	Rating of others (general)	.323	.628***	.403*	-.027	.205	.154
	Satisfaction (general)	-.353*	-.484**	-.388*	-.054	-.011	-.011

*** $p < .001$ ** $p < .01$ * $p < .05$