Spontaneously occurring images and early memories in people with body dysmorphic disorder

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A semi-structured interview assessing the presence and characteristics of spontaneous appearance-related images was designed and administered. A total of 18 patients with body dysmorphic disorder (BDD) and 18 normal controls took part. The BDD patients were found to have spontaneously occurring appearance-related images that were significantly more negative, recurrent, and viewed from an observer perspective than control participants. These images were more vivid and detailed and typically involved visual and organic (internal body) sensations. The study also found that BDD images were linked to early stressful memories, and that images were more likely than verbal thoughts to be linked to these memories. Implications for theory and clinical practice are discussed.

Horowitz (1970) defined images as contents of consciousness that possess sensory qualities, as opposed to those that are purely verbal or abstract. While the visual modality is most prominently represented within mental imagery, images can, and often do, have qualities associated with any of the senses. In addition to this, images can also be divided into different types and categories. They may occur spontaneously, be deliberately generated, transformed, or suppressed. They may reflect past, present, or future perspectives and may be literal or symbolic. Compared to verbal thoughts, images may sometimes provide direct access to a holistic network of beliefs underlying emotional responses that may be difficult to identify through questioning alone (Hackmann, 1998).

There is also evidence to suggest that an important relationship exists between images and autobiographical memories. For example, the presence of mental imagery has been found to be a general predictor of memory specificity (Williams, Healy, & Ellis, 1999). Intrusive memories involving recall of event specific knowledge (ESK) (Conway & Pleydell-Pearce, 2000) are core symptoms of post-traumatic stress disorder (PTSD; American Psychiatric Association, 1994). These often manifest as images. Cognitive theories of PTSD (e.g. Brewin, Dalgleish, & Joseph, 1996) typically include reference to imagery, and link it to autobiographical memory and emotional processing.

Research examining the nature and meaning of imagery in different psychological disorders, and links to early memories, has grown in recent years. For example, patients with social phobia (Hackmann, Surawy, & Clark, 1998) have been shown to report experiencing significantly more spon-

taneously occurring images in anxiety-provoking social situations than non-patient controls. These images are typically negative in content, involve seeing oneself from an observer perspective (i.e., from an external viewpoint), and are perceived as at least partially distorted when considered after the event (Hackmann et al., 1998).

The images of people with social phobia also appear to be recurrent and involve sensory components in a variety of modalities. For example, Hackmann, Clark, and McManus (2000) found that bodily sensations occurred as an aspect of imagery almost as often as visual sensations. Importantly, the reported recurrent spontaneous images were linked to particular memories of events that occurred close in time to the onset of the social phobia. Images and associated memories were well matched with regard to their sensory content in the various modalities. Similar findings have been reported in other disorders (e.g., health anxiety, Wells & Hackmann, 1993: agoraphobia, Day, Holmes, & Hackmann, 2004 this issue).

While research examining the nature and meaning of imagery in psychological disorders has grown in recent years, most of this work has focused on anxiety disorders, with little research exploring the existence of imagery in other psychological conditions. It might be hypothesised from a clinical perspective that mental imagery would be implicated in disorders of body image, which include the eating disorders (anorexia nervosa and bulimia nervosa), and a more specific disorder of body image concern, known as body dysmorphic disorder (BDD). This paper is concerned with examining the nature and content of imagery in BDD.

A key criterion for the diagnosis of BDD in DSM-IV (*Diagnostic and statistical manual of mental disorders*, American Psychiatric Association, 1994) is ''a preoccupation with a defect in appearance . . . the defect is either imagined, or, if a slight physical abnormality is present, the individual's concern is markedly excessive'' (p. 466).

Cognitive behavioural models have been developed for the understanding and treatment of BDD (Veale et al., 1996). Veale (2002) subsequently hypothesised that BDD patients have idealised values about the importance of appearance and tend to view themselves as an aesthetic object. Clinical experience suggests that patients suffer from extreme self-consciousness, with negative images of themselves, viewed mainly from an observer perspective (similar to images in

social phobia). However, this has not been empirically investigated, nor has the possible input from memory.

The hypotheses in this study were as follows: (1) People with BDD will report having more spontaneously occurring images (that are negative and recurrent) when asked about their appearance, compared to control participants. (2) The sensory modality characteristics of BDD images, and the perspective from which they are observed, will differ to those of the control group. (3) Spontaneously occurring images in people with BDD will be linked to early memories and experiences. (4) Images in people with BDD are more likely to be associated with stressful early memories than verbal thoughts.

METHOD

Participants

A total of 18 patients with BDD (9 men and 9 women) and 18 control participants (9 men and 9 women) aged between 17 and 49 years took part in the study. The mean age in years was 27.50 (SD = 7.02) for the BDD group and 26.83 (SD = 6.67) for the control group. Patients with BDD were recruited from The Priory Hospital, North London, through their consultant psychiatrist. All gave their informed consent for the study. Those with concurrent dementia/organic brain disorder, schizophrenia, delusional disorder, substance misuse, and those with a primary diagnosis of an eating disorder were excluded.

Clinically there is some overlap in typical symptoms in BDD and eating disorders. Therefore, to confirm that participants had a primary diagnosis of BDD and did not have a co-morbid eating disorder, all were screened with the BDD and eating disorder modules of the Structured Clinical Interview for DSM-IV (SCID), (Spitzer, Williams, & Gibbons, 1996).

The control participants (non-clinical) were recruited by requesting volunteers from among hospital staff and colleagues.

Measures

The interviewer rated BDD patients on the Yale-Brown Obsessive Compulsive Scale (Y-BOCS) modified for BDD (Phillips, Hollander, Rasmussen, Arnowitz, DeCaria, & Goodman, 1997). This is a short 12-item semi-structured interview used

to assess the severity of BDD symptoms. All participants also completed the Beck Depression Inventory-II (BDI-II; Beck, Steer, & Brown, 1996), Rosenberg Self-Esteem Inventory (RSE; Rosenberg, 1965), Fear of Negative Evaluation Scale (FNE; Watson & Friend, 1969), and The Body Consciousness Questionnaire (BCQ; Miller, Murphy & Buss, 1981).

Semi-structured interview

The semi-structured interview was adapted from Hackmann et al. (2000, 1998) and comprised two sections, one investigating spontaneously occurring imagery and one investigating thoughts. The interview was piloted on eight volunteers (two men and two women from each group). No modifications were made to the schedule and the pilot data were thus included in the main analysis.

Spontaneous imagery section of interview

In this section participants were asked to think about a recent time when they had felt really worried and anxious about their appearance. They were asked if they had *ever* experienced any spontaneous images (using Horowitz's 1970 definition) at such times. If no images were reported, participants were asked if they had ever experienced an impression of the way they thought they looked, or how others might see them at such times. This was to capture sensory impressions other than visual pictures, should the participants have understood this to be a distinction. They were also asked if any of the images or impressions were recurrent. Participants were asked to recreate and describe the content of one of these images or impressions. They were asked about each of the sensory modalities in the image/ impression in the following order: visual (*"Can you see anything in your image?"*), auditory (*"Can you hear anything in the image?"*), kinaesthetic (*"Are you performing any acts in the image?"*), cutaneous (*"Do you notice any sensations of touch or pressure upon your skin, from an external source?"*; *"Are you touching anything in the image?"*), organic or internal bodily sensations (*"Do you notice any sensations inside your body?"*), gustatory (*"Do you notice any sensations of taste?"*), and olfactory (*"Do you notice any sensations of smell?"*). The characteristics of each modality were explored in detail (e.g., *"How vivid

is the image/impression of yourself in your mind's eye?"*), with participants rating their responses on a 101-point scale (e.g., 0 = not at all vivid, 100 = extremely vivid).

The perspective from which each participant observed their image/impression was rated on a 7-point scale. Scores ranged from +3 (observer perspective: seeing myself completely from an external viewpoint, as if from another person's vantage point) to −3 (observing myself completely through my own eyes, as if looking in a mirror). This scale contrasted the observer perspective not with the field perspective (as in Wells, Ahmad, & Clark, 1998), but with a variant of the field perspective, in which the subject is viewing their self through their own eyes, as if in a mirror. This was because pilot work suggested that many control subjects described their image in this way. A 7-point scale was also used (by participant and interviewer independently) to rate the emotional tone of the image/impression from −3 (extremely negative) to +3 (extremely positive).

Participants were then asked when in their life they had first experienced the sensations, thoughts, and feelings they had in the image/ impression, and if there was a particular memory that seemed closely linked to it. They were asked to evoke a relevant memory, which was then explored, as with the image, in terms of its content and sensory qualities. They also rated the extent to which the memory resembled the image in terms of its sensory qualities, emotional significance, and interpersonal meaning. Again, 101-point scales were used for these ratings (e.g., 0 = not at all similar, 100 = extremely similar).

Verbal thoughts section of interview

In this section participants' appearance-related thoughts were explored in the same way as relevant aspects of their images.

Procedure

Participants were interviewed individually by the first author (SO). The semi-structured interview took between 45 and 120 minutes and the two sections were administered in counterbalanced order. All interviews were audio taped with participants' permission. Four participants from each group agreed to repeat the interview for test–retest purposes. All repeat interviews took place within 4 weeks of initial administration.

RESULTS

Analysis for normality (Kolmogorov-Smirnov Test) and equality of variance (Levene's Test for Equality of Variance) was carried out on the data. Parametric tests (e.g., independent t-test) were used where the assumptions for such testing were met. In all other cases, non-parametric equivalents were employed to assess between group differences (e.g., Mann-Whitney Test, Chi-square Test, Fisher's Exact Test) and within group differences (Wilcoxon Signed Ranks Test).

Descriptive data

Demographic data. The median number of years in full time education for each group, and inter-quartile ranges (IQR) were 14.00 (IQR = 12.00–15.00) and 15.00 (IQR = 13.75–16.00) respectively. There were no significant between-group differences for age ($t = 0.29$, $df = 34$, $p = .77$) or years in education ($U = 117.00$, $p = .16$).

Clinical characteristics. The mean age of onset of BDD was 14.50 years ($SD = 7.68$) and mean length of time in treatment was 7.92 months ($SD = 9.62$). For women, typical features of concern were their skin, eyes, hair, teeth, and genitalia. For the men, eyes, hair, and genitalia were also common concerns, as well as their nose and head size. On the Y-BOCS modified for BDD, the patients had a mean score of 34.06 ($SD = 8.28$), indicating that they had relatively severe symptoms. Medians (and IQR) for the self-report questionnaires for both groups are presented in Table 1.

According to questionnaire scores the BDD patients were more depressed (BDI-II: $U = 8.00$, $p < .001$), had lower self-esteem (RSE: $U = 4.50$, $p < .001$), and had higher fear of negative evaluation by others (FNE: $U = 24.00$, $p < .001$) than the control participants. Participants in the BDD group were also more conscious of their internal body sensations (BCQ private body consciousness: $U = 66.50$, $p = .002$) and external appearance (BCQ public body consciousness: $U = 55.00$, $p = .001$). No significant between-groups difference was found on the BCQ body competence subscale (BCQ body competence: $U = 132.00$, $p = .36$).

Reliability of the semi-structured interview

Test–retest reliability. Test–retest reliability was assessed (for the participants who repeated the interview) item-by-item using the Wilcoxon Signed Ranks Test. No significant between-group differences for the images/impressions were observed at retest for any of the sensory modalities.

Frequency of spontaneous images/ sensory impressions

All of the BDD patients reported experiencing either spontaneous images ($n = 17$, 94%) or other sensory impressions ($n = 1$, 6%) when worried or anxious about their appearance. Of the control participants, 15 (83%) reported either spontaneous images ($n = 6$, 33%) or sensory impressions ($n = 9$, 50%). Images and sensory impressions were collapsed into one category and are reported as images/impressions for the remainder of the analyses. There was no difference between the

TABLE 1
Medians (and IQR) for BDD and control participants on the self-report measures

Scale	BDD group ($n = 18$)	Control group ($n = 18$)
BDI-II	30.50 (16.50–46.25)	2.50 (0–6.25)
RSE	30.00 (28.00–36.00)	15.50 (11.00–19.50)
FNE	28.50 (26.75–30.00)	14.50 (7.75–19.50)
BCQ subscales		
Private body consciousness	16.00 (11.75–18.00)	9.00 (7.75–12.00)
Public body consciousness	20.00 (15.50–22.00)	12.00 (10.50–14.25)
Body competence	8.00 (6.75–9.00)	6.50 (6.00–10.00)

BDI-II = Beck Depression Inventory-II; RSE = Rosenberg Self-Esteem Inventory; FNE = Fear of Negative Evaluation Scale; BCQ = Body Consciousness Questionnaire.

patients and controls in reported frequency of spontaneous images/impressions (Fisher's Exact Test, $p = .11$).

Characteristics of spontaneous images/impressions

Of those experiencing spontaneous images/ impressions, 17 (94%) in the patient group and 7 (46%) in the control group reported these to be recurrent. The difference was significant (Fisher's Exact Test, $p = .002$).

Sensory modality characteristics

The median number of modalities reported for the images/impressions was 2.00 (IQR = 1.00–2.00) for the patient group and 1.00 (IQR = 1.00–2.00) for the control group. This difference was significant ($U = 98.50$, $p = .04$).

The visual modality was the most commonly reported sensory modality for both patients and controls, followed by the organic modality. The latter consisted of feelings of anxiety, such as tingling sensations in the body part of concern and a feeling of butterflies in the stomach. No participants reported gustatory or olfactory sensations.

Differences between groups in imagery characteristics

The BDD group reported images/impressions that were visually more vivid ($U = 0.00$, $p < .001$), brighter ($U = 42.50$, $p = .02$), more detailed ($U = 32.50$, $p = .004$), and involved facial and bodily features that took up a greater proportion of the whole image ($U = 39.50$, $p = .01$) than control participants. The BDD images/impressions also involved organic sensations that were more vivid ($U = 6.00$, $p = .002$) and intense ($U = 8.50$, $p = .005$). Median scores (and IQR) for both groups can be seen in Table 2.

The observer/mirror perspective

The median ratings for perspective of the images/ impressions were 3.00 (viewing myself completely from an external viewpoint, as if through the eyes of another, IQR = 3.00 to 3.00) for the BDD group and -3.00 (viewing myself completely from my own eyes, as if in a mirror, IQR = -3.00 to -3.00) for the control group. It is notable that the scale could have been collapsed, as participants used it as a categorical measure rather than a continuum, utilising only extreme ends of the scale. All BDD participants saw themselves from an observer perspective, while all control participants reported the mirror perspective.

Emotional tone of the images/impressions

The median participant ratings of the emotional tone of their images/impressions were -3.00 (IQR = -3.00 to -2.75) for the patient group and -1.00 (IQR = -1.00 to -1.00) for the control group. BDD patients' ratings were significantly more negative ($U = 28.50$, $p < .001$) than the control groups' ratings.

TABLE 2
Medians (and IQR) of sub-modalities for the BDD and control groups

Characteristics	BDD group (n = 15, 83%)	Control group (n = 12, 80%)	Significance level
Visual			
Vividness	90.00 (85.00–100.00)	10.00 (7.50–17.50)	****
Brightness	60.00 (40.00–70.00)	35.00 (10.00–50.00)	*
Detail	90.00 (60.00–100.00)	60.00 (12.50–68.75)	***
Proportion of whole image	80.00 (70.00–95.00)	50.00 (40.00–60.00)	*
	(n = 13, 72%)	(n = 5, 33%)	
Organic (internal sensations)			
Vividness	90.00 (52.50–95.00)	12.50 (8.75–51.25)	***
Intensity	90.00 (55.00–100.00)	37.50 (17.50–56.25)	*

*$p < .05$, **$p < .01$, ***$p < .005$, ****$p < .001$.

Characteristics of early memories associated with images/impressions

Of the 18 BDD patients who reported spontaneous images/impressions, 15 (88%) reported that they were associated with a particular stressful memory. The median age in years associated with the event that occurred in the memory was 11.50 (IQR = 10.00–21.50). Typical themes included: being teased and bullied at school (e.g. "*I was 10 years old and never got on with this boy in school. I remember one day asking him why he didn't like me and he said 'it's because you're ugly'.*") and self-consciousness about appearance changes during adolescence (e.g. *"I was very tall for my age and I remember queuing up in the playground after break time one day and seeing my reflection in the hall window. My whole face and body seemed out of proportion and I was about two heads taller than everyone else."*).   Inspection of the themes suggested that all the early memories could be placed in one (or both) of these two categories.

Of the 15 control participants who reported spontaneous images/impressions, only 2 (13%) reported these to be closely linked to a particular memory. The median age in which the memory occurred was 13.00 (IQR = 10.50–5.50). Significantly more BDD patients reported a particular memory associated with their images, $x^2(1) = 14.07$, $p < .001$, than control participants.

Table 3 illustrates the number (and percentage) of BDD patients reporting each sensory modality represented within the associated early memories/experiences. One patient did not wish to discuss their memory. The characteristics of the early memories reported thus relate to the remaining 14 patients. For ease of comparison, the relevant data for images/impressions are also reproduced in this table.

TABLE 3
Number (and percentage) of BDD patients reporting sensory modalities within their images and associated memories

Modality	Images (*n* = 18)	Early memory (*N* = 14)
Visual	15 (83%)	14 (100%)
Organic (internal)	13 (72%)	12 (85%)
Auditory	1 (6%)	8 (57%)
Kinaesthetic	1 (6%)	6 (43%)
Cutaneous	1 (6%)	5 (36%)
Gustatory	0	0
Olfactory	0	0

The median number (and IQR) of modalities reported for the BDD group early memories was 2.50 (IQR = 0.75–4.00). As for images/impressions, the visual modality was the most frequently reported sensory modality, followed by the organic sensation modality. These memories were also mainly viewed from an observer perspective (median = 3.00, IQR = 2.00–3.00). Again, no patients reported the presence of gustatory or olfactory sensations. There was no difference between the median number of modalities reported in the BDD groups' spontaneous images/impressions and early memories ($Z = -1.31$, $p = .19$).

Mean sensory similarity reported between the spontaneous image/impressions and the associated memories was 60%, mean emotional similarity was 65%, and mean interpersonal similarity was 71%. Inspection of the data suggested that there was generally a close match between reported modalities, i.e., patients who experienced a particular modality in their images/impressions were also likely to experience that modality in the associated memory.

Characteristics of early memories accessed through verbal thoughts

A total of 11 BDD participants (61%) and 2 control participants (11%) reported early memories associated with thoughts. This difference was significant, $x^2(1) = 6.48$, $p = .04$. The median age of the participants within the memories reported by the BDD participants was 15.00 years (IQR = 10.00–22.50). This was not significantly higher than the median age (11.50, IQR = 10–21.50) in the reported early memories associated with images/impressions ($Z = -1.65$, $p = .86$).

Finally, the images/impressions of the BDD participants were more likely than thoughts to be linked to stressful early memories, $x^2(1) = 3.74$, $p = .05$.

DISCUSSION

In line with the hypotheses, BDD patients were found to have significantly more spontaneously occurring appearance-related images/impressions that were negative, recurrent, and viewed from an observer perspective, than control participants. These images/impressions were also more vivid and detailed, and typically involved a greater number of sensory modalities, the most common

of which were visual and organic. Analysis revealed that these imagery characteristics could be reliably assessed over time. Given the suggestion that people with BDD tend to selectively attend to interoceptive information (Veale et al., 1996), and the notion that visual imagery is the most common type of imagery (Marks, 1973), the current finding that visual and organic sensations predominate is not surprising. Other modalities may predominate in other clinical populations (consistent with the content of the disorder and hypothesised psychological processes). For example, a recent study has indicated that the kinaesthetic and visual modalities were important in people anxious about spiders (Pratt, Cooper, & Hackmann, in press).

Thus, while the occurrence of spontaneously occurring appearance-related images/impressions was similar in both groups (implying that the presence of such imagery is in fact common in both clinical and non-clinical populations), the findings suggest that it is the quality of these images, rather than their presence, that differentiates individuals with, and those without, BDD.

The BDD patients reported more images/impressions viewed from an observer perspective than controls. Clark and Wells' (1995) model of social phobia suggests that observer perspective imagery is partly constructed from interoceptive information. In BDD as in social phobia, part of the input may also be from memory of previous stressful experiences, where individuals have come under scrutiny perceived as critical. Thus imagery may be unlikely to convey an accurate impression of actual appearance. Interestingly Veale and Riley (2001) note that negative images arise when BDD patients attempt to look in a mirror. They may avoid close scrutiny of the actual reflection, and thus images do not get updated. By contrast participants without BDD, who are presumably not over-worried about their appearance, can and do look in mirrors. Memories may be formed of times when they occasionally see images discrepant with their usual appearance.

Images/impressions in the BDD group were typically considered to be linked to early stressful memories. The age of BDD participants in these memories and the themes that emerged from them provide support for models that identify typical symptom onset in early adolescence (e.g., Rosen, Reiter, & Orosan, 1995; Veale et al., 1996).

The link between appearance-related images and early stressful experiences suggests that some people may develop negative self-images early on that may contribute to the development of BDD symptoms, and that fail to update. Three processes (suggested by Hackmann et al., 2000, in relation to social phobia) might help to explain this phenomenon in BDD. The first is an attentional bias, and relates to the increased self-focused attention observed in BDD patients when negative appearance-related images arise (e.g., in front of a mirror, Veale & Riley, 2001). Second, BDD patients frequently avoid situations in which negative evaluation (of appearance) by others is anticipated or, if such situations are not avoided, subtle in-situation safety behaviours (e.g., camouflage) are employed. Both of these processes may prevent patients from noticing information that might correct their distorted negative self-images. Third, when patients do receive positive feedback about their appearance, this usually occurs in verbal form and, as a consequence, may be poorly suited to modifying visual images (Hackmann et al., 2000). In addition to these processes, information from others may be discounted as untrue by BDD patients (e.g., "they are only saying it to be nice to me") or may not be considered of value, as some patients may be more concerned with failure to achieve their own aesthetic ideals, than the demands of others (Veale, Kinderman, Riley, & Lambrou, 2003).

The observer perspective found in the images of people with this disorder may be viewed as one possible consequence of maladaptive attentional processes. Thus, it is conceivable that treatment strategies aimed at the alleviation of dysfunctional self-focused attention might modify biased imagery in BDD. Wells and Papageorgiou (1998) demonstrated that exposure plus externally focused attention produced greater reductions in anxiety and negative beliefs than exposure alone in people with social phobia. Moreover, the attention condition resulted in a significant shift from the observer to the field perspective in imagery, while the exposure alone condition did not.

The current study provides some empirical evidence for the role of imagery in BDD, and thus some preliminary support for Veale's (2002) hypothesis that BDD patients view themselves as an aesthetic object with extreme self-consciousness. Existing cognitive models of BDD (Veale et al., 1996) have been revised to acknowledge the importance of these findings (Veale, 2004).

There are a number of limitations to this study. An important conceptual limitation relates to the

vague and all-encompassing definitions of imagery within the literature. As a result of this, other sensory impressions were placed within the same category as images (as in the study reported by Hackmann et al., 1998). This raises some important empirical questions. Are ''images'' and ''impressions'' considered by participants to denote similar phenomena, or are they seen as qualitatively different, with the latter perhaps referring to a milder, less distressing type of imagery? Within the current study, participant numbers were too small to allow for a comparison between images and impressions, and as a result, this is an important conceptual issue that requires further investigation.

The current study relied on verbal self-reporting as the main method of data collection. However, describing one's cognitive processes and conveying them accurately is not always straightforward and can be especially problematic in the case of imagery (Kendall & Korgeski, 1979). Furthermore, while this study identified a link between spontaneously occurring imagery and early memories, it would be presumptuous to assume causality. More detailed qualitative and quantitative analysis is needed to clarify the possible mechanisms involved. Future research exploring imagery in BDD would benefit from a larger sample size, recruited from multiple settings. The psychometric properties of the semi-structured interview also require further investigation. At present, studies of imagery within the psychological disorders tend to be disorder-specific. However, the observed link between the observer perspective and social-evaluative concern in both social phobia and BDD suggests that it might be of greater benefit to focus on how images differ in relation to specific beliefs or themes. Finally, a more detailed examination of memories that are linked to appearance-related images might prove beneficial in informing current theories of BDD, as well as influencing clinical practice.

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