Interoceptive Awareness and Self-Objectification in Body Dysmorphic Disorder

Michelle Pratt

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Abstract

The cognitive model of BDD (Veale, 2004) proposes high levels of self-objectification (viewing and treating oneself as an object) as an important maintaining factor; however, to date this construct has not been empirically measured in this population. In addition, recent models of the self (Damasio, 2010) point towards the central role of interoceptive awareness (IA; the ability to identify bodily signals) in developing a sense of self. Low levels of IA have been associated to body dissatisfaction, eating disorders and depression. The aim of this study was to investigate the role of self-objectification and interoceptive awareness in patients with BDD.

Three groups of participants with BDD (n=14), anxiety (n=23), and non-clinical participants (n=23) completed a heartbeat detection task to measure levels of IA under two conditions: blank screen and while facing a mirror in order to also explore the impact of self-focus attention on IA. Levels of self-objectification and self-focussed attention were measured through self-report questionnaires. Statistical comparisons between groups indicated significantly lower levels of IA in the BDD group at blank screen only when compared to the non-clinical group. In the mirror condition the BDD group had significantly lower IA scores than both control groups. Furthermore, the BDD group reported significantly higher self-objectification than the non-clinical group, and there was a trend towards the group scoring at a higher level than the anxiety group. Across groups there was no significant relationship between levels of IA in either condition, and self-reported levels of self-objectification or self-focussed attention.

The results support the role of self-objectification in BDD and points towards the potential contribution of somatoperception. The theoretical and clinical implications of these findings, the limitations of the methodology employed, and suggestions for future research are discussed.

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Chapter 1: Introduction

Body dysmorphic disorder (BDD) is a prevalent mental health condition, which when experienced often has serious consequences for many individual's quality of life. Despite high estimated prevalence rates within the population, there is currently a dearth of research into the disorder in comparison to other mental health conditions. In particular, there has been little research which has explored aspects of psychological models which have been proposed to explain the maintenance of the disorder, and also what underlying biological or sensory processes may contribute to such aspects.

Veale's (2004) cognitive model of BDD proposes that increased levels of self-objectification and differential self-focussed attention may be two aspects which are crucial in maintaining BDD. However, to date there has been a lack of research which has investigated self-objectification in BDD. High levels of self-objectification as well as other aspects of the self relevant to BDD (e.g. excessive focus on the external body) have been linked to a reduced ability to identify internal bodily signals (interoceptive awareness), yet again this has not been investigated in BDD. Recent research has suggested that interoceptive awareness may be malleable, and could be improved by increasing self-focussed attention to the body (Ainley, Tajadura-Jimenez, Fotopoulou, and Tsakiris, 2012). Therefore, investigating interoceptive awareness in BDD and how this may be related to factors which have been suggested to maintain BDD in Veale's cognitive model (2004), namely self-focussed attention and self-objectification, may not only lend support to the cognitive model, but also further understanding of factors which may underlie and contribute to the development and maintenance of BDD.

Body Dysmorphic Disorder

Body Dysmorphic Disorder (BDD) is a condition which is associated with significant distress in relation to a person's physical appearance, with people with this diagnosis perceiving there to be a defect or imperfection in their physical appearance which is either usually non-existent or not noticeable to other people (Diagnostic Statistical Manual V; DSM-V, American Psychiatric Association; APA, 2014). The DSM-V states that for a diagnosis of BDD to be given the following criteria must be met:

a) "Preoccupation with one or more perceived deficits or flaws in physical appearance that are not observable or appear slight to others."

b) "At some point during the course of the disorder, the individual has performed repetitive behaviors (e.g. mirror checking, excessive grooming, skin picking, reassurance seeking) or mental acts (e.g. comparing his or her appearance with that of others) in response to the appearance concerns."

c) "The preoccupation causes clinically significant distress or impairment in social, occupational, or other important areas of functioning."

d) "The appearance preoccupation is not better explained by concerns with body fat or weight in an individual whose symptoms meet criteria for an eating disorder." (242-243; DSM-V, American Psychological Association: APA, 2014)

The diagnostic category that BDD was classified under in DSM-IV (2000) was that of somatoform disorders. In the new edition of the DSM, namely DSM-V (APA, 2013), BDD has been re-classified under obsessive-compulsive disorders. This is in line with recommendations made by various researchers (Phillips, Stein, Rauch, Hollander, Fallon, & Barsky 2010; Chosak, Marques, Greenberg, Jenike, Dougherty, & Wilhelm, 2008; Hollander, Braun, & Simeon, 2008)

regarding characteristics of BDD which they believe suggests an overlap with obsessional disorders, such as the use of safety behaviours.

Areas of concern can vary between individual's and are often multiple rather than singular. The nose, face, ears, skin, breasts, and hips have been reported as common areas of concern (Kaplan, Rosell, Enticott, & Castle, 2013). Onset of BDD is reported to frequently occur during adolescence (Kaplan et al., 2013), and prevalence estimates of BDD have varied between 0.7% to 2.4% of the population (Buhlmann, Glaesmer, Mewes, Fama, Wilhelm, Brähler et al., 2010).

Whilst the previously reported population estimates appear relatively high, studies carried out within the population have in fact reported prevalence estimates ranging from 2% to as high 13% (Biby, 1998; Mayville, Katz, Gipson, & Cabral, 1999; Bohne, Wilhelm, Keuthen, Florin, Baer, & Jenike, 2002; Cansever, Uzun, Donmez, & Ozsahin, 2003; Taqui, Shaikh, & Gowani, 2008; all cited in Bjornsson, Didie, & Phillips, 2010). With regards to gender, BDD has been reported to affect both males and females, and is observed somewhat more frequently in females (Kaplan et al., 2013).

A population based study carried out in (2006) by Rief, Buhlmann, Wilhelm, Borkenhagen, and Brähler (2006) invited 4125 demographically representative participants across Germany to complete questionnaires regarding BDD symptomology. Of the invited sample, 62.3% (n = 2552) responded to this request, and results indicated the existence of BDD symptomology in around 1.9% of females and 1.4% of males in Germany if taken at a population level. In addition, a study carried out in the United States of America (USA) by Koran, Abujaoude, Large, and Serpe (2008) reported a similar pattern, with prevalence based on DSM-IV criteria estimated to be around 2.5% of females and 2.2% of males (n = 2048). Koran et al. (2008) noted that this prevalence estimate would mean rates of BDD would exceed those of

Schizophrenia and Bipolar Disorder within the USA population. However, Koran et al.'s (2008) sample was not entirely representative, including a higher proportion of females aged over 55 years and a lower rate of people of Hispanic origin than was observed across the population of the USA at that point in time. Also, Bartsch (2007) has estimated that BDD may be seven time more prevalent in the general population than anorexia nervosa, another clinical disorder linked to distorted perceptions of the external body.

Further to this, prevalence estimates of BDD in clinical studies and within dermatology and cosmetic surgery clinics have been significantly higher (Gupta, Huynh, & Ginsberg, 2013). For example, Gupta et al. (2013) cite studies offering prevalence rates as high as 53% of people seeking cosmetic surgery. Due to the nature of BDD it would appear that many people who may be diagnosed with the condition are more likely to approach a dermatologist or cosmetic surgeon rather than a mental health professional, as they believe they have a physical imperfection which should be rectified (Veale, 2001).

It is clear from available prevalence estimates that BDD is a common mental health condition. Whilst prevalence estimates suggest the condition occurs frequently within the general population, Bjornsson et al. (2010) have suggested that prevalence estimates reported to date within both clinical and non-clinical populations may actually underestimate the prevalence of BDD. Bjornsson et al. (2010) suggest that the shame felt by many individual's with BDD around their experiences of pre-occupation with their physical appearance leads to them remaining silent and not seeking professional help. This, coupled with the lack of awareness of the condition by professionals and lay people, the likelihood of people seeking cosmetic alteration (Veale, 2001), and the comorbidities that may be more likely to be recognised and diagnosed alongside or instead of BDD (such as OCD and depression) may contribute to the large variations in reported prevalence.

It should be noted that the vast majority of research into BDD to date has been carried out within Western populations, and the prevalence of the condition within Eastern cultures remains unclear. Despite this, even if prevalence estimates are assumed to be at the moderate end of the published data reported, BDD should be seen as a frequently occurring mental health condition. Given this fact, and the impact BDD can have on an individual's wellbeing (which is discussed further into the chapter), there are still many aspects of the underlying pathology and maintenance of BDD which have yet to be explored. Significant efforts should be made in order to understand such issues in greater depth and consider how best individual's who experience BDD can be supported.

Classification and Comorbid Disorders.

People diagnosed with BDD have often been reported to suffer with other co-morbid Axis 1 disorders. Phillips, Menard, Fay, and Weisberg (2005) used the Structured Clinical Interview for DSM (First, Spitzer, Gibbon, & Williams 2002; in Phillips et al., 2005) to assess co-morbid disorders in a sample of 200 individual's diagnosed with BDD. The authors reported co-morbid major depressive disorder in around 75% of their sample, replicating the report of Gunstad and Phillips (2003) who also documented similar levels of comorbid major depressive disorder in a separate sample of 293 individual's with BDD. Both studies also reported high rates of comorbid substance abuse (30% and 49.8%) OCD (32% and 33%), and social phobia (37% and 39%). Each study included participants who were receiving treatment for their condition and not receiving treatment, and Phillips et al. (2005) reported that participants who were in treatment were more likely to meet the diagnostic threshold for a co-morbid disorder.

Co-morbid social anxiety has also been reported as common (Pinto & Phillips, 2005; Kelly, Walters, & Phillips, 2010), and it has been suggested that even for people who do not display this co-morbidity, social avoidance can play a large role in their life and maintenance of

BDD. Bjornsson et al. (2010) have postulated how readily the person diagnosed with BDD may avoid social or employment situations for fear of being judged by others as being unattractive or defective, ultimately maintaining and heightening fears related to judgement of appearance. In a study carried out by Kelly, Walters, and Phillips (2005) higher self-ratings of social anxiety in a sample of individual's diagnosed with BDD (n = 108) were linked to lower levels of psychosocial functioning over a twelve month period, with such individual's more likely to avoid many social situations.

A relationship between BDD and OCD symptomology and underlying pathology has also been reported to exist, with the two disorders now classified under the same category in the recently revised DSM-V as mentioned previously. Phillips, Pinto, Hart, Coles, Eisen, Menard et al. (2012) have commented on the frequency with which similarities are observed with regards to symptoms (e.g., obsessions) and also response to treatment such as exposure and response prevention. Phillips et al. (2012) have also mentioned the potential for shared neurological pathways, yet state that to date there has been a shortage of studies focussed on the neurobiology of BDD. The work of Bienvenu et al. in 2000 and 2012 estimated that BDD is six times more prevalent in the first-degree relatives of people diagnosed with OCD in comparison to family members of people without this condition (Bienvenu, Samuels, Riddle, Hoehn-Saric, Liang, Cullen et al., 2000; Bienvenu, Samuels, Wuyek, Liang, Wang, Grados et al., 2012).

Whilst BDD and OCD share similarities, there are also important factors which differentiate them. As well as the differing function of compulsions within the disorders and heightened pre-occupation with the external body in BDD, another factor which seems to vary markedly across the disorders is level of insight. A number of studies have considered the degree to which people diagnosed with BDD and OCD think of their beliefs as accurate and true reflections, rather than a disorder. Observational and experimental studies have frequently

found individual's with OCD to have greater insight and less delusional beliefs than individual's with BDD (e.g. de Leon et al.,1989; Eisen, 2004; McKay et al., 1997; Mckenna et al., 1984; Reese et al., 2011; cited in Phillips et al., 2012).

Given the high estimated prevalence rates of BDD and also the fact that individual's frequently experience co-morbidities, which may further add to their distress, various studies have addressed the significant impact that BDD has on functioning and wellbeing.

Impact of BDD

As well as being estimated as a common mental health condition, BDD has also been reported to hugely impact on the functioning of people who live with the disorder, being linked to a reduced quality of life as well as an increased risk of suicide. In one of the first studies to document the impact of BDD, Phillips, McElroy, Keck, Pope, and Hudson (1993) interviewed 30 people with a diagnosis of BDD about their experience of living with the condition (n = 17 males, 13 females). Within this sample, 29 participants reported avoiding social activities, with nine participants reporting that the condition had led to them becoming housebound. In addition, five participants reported attempting suicide. Shortly after this study Veale, Boocock, Gournay, Dryden, Shah, Willson et al. (1996) similarly interviewed 50 participants with a diagnosis of BDD (n = 35 females, 15 males), and reported a strong association between BDD and past suicide attempts, and also higher rates of people who were single or divorced than would be expected.

Since this seminal work, more recent research has continued to document the difficulties experienced by people with BDD. Ishak, Bolton, Bensoussan, Dous, Nguyen, Powell-Hicks et al. (2012) recently carried out a literature review of quality of life in clients diagnosed with BDD. The authors reported that BDD is associated with a poor quality of life, with those affected by

the condition reporting low levels of wellbeing, and low levels of satisfaction with their life and the activities that they pursued.

With regards to long term outcomes, Phillips et al. (2005) have suggested that BDD tends to be a chronic and often life-long condition with a low likelihood of full recovery, even when treatment is accessed. Phillips, Pagano, Menard, and Stout (2006) investigated the course of BDD symptomology over a twelve month period, following a total of 183 participants who had been diagnosed with BDD. Phillips et al. (2006) reported a 0.09 probability of full recovery (defined as minimal or no BDD symptoms over eight consecutive weeks) within this sample, despite the fact that 84.2% of the sample had received treatment from a mental health service within this twelve month period.

Buhlmann (2011) investigated access to treatment in an internet sample of 172 individuals who had self-reported BDD. Only 40 of these participants (less than 25%) had been given their diagnosis by a mental health professional, and 66 in total were receiving therapy from a mental health professional (n = 34) or were taking prescribed medication (n=32). While this was a small self-report sample, it provides evidence that many people who experience BDD may not seek or receive treatment.

Low levels of awareness, understanding, and access to treatment are likely to impact upon chances of recovery from BDD as well as adding to feelings of isolation, despair, and dissatisfaction with life as reported in the previously outlined studies. As a result of the impact of BDD, various psychological models have been proposed which attempt to outline how the disorder is developed and maintained.

Models and Theories of BDD

With regards to psychological theories around BDD, the literature highlights two main models namely the cognitive model proposed by Veale (2004), and the social learning model of BDD by Neziroglu, Roberts, and Yaryura-Tobias (2004). Various authors of a psychoanalytic discipline have also commented on BDD and its origins (such as Lemma, 2009) but due to the focus and constraints of the current thesis the only model that will be discussed further is Veale's (2004) cognitive model.

Cognitive model of BDD.

Veale (2004) has discussed the importance of early life experiences, such as bullying, and the impact of the societal expectations of a pleasing aesthetic appearance, on the development of BDD. However, Veale's (2004) cognitive model focuses on factors which he believes are vital in explaining the maintenance of BDD following the onset of the disorder. A diagrammatic representation of the model is displayed below in Figure 1.1.
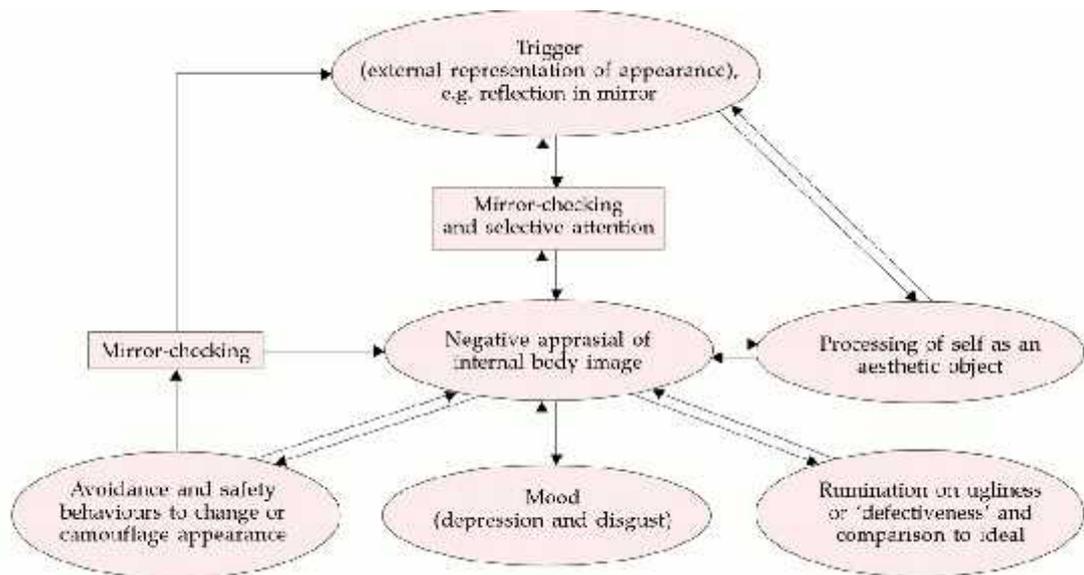
Figure 1.1 – Cognitive model of BDD (taken from Veale, 2001; pp. 125-132)

This cognitive model highlights external representations of a person's appearance as a trigger for negative emotions being experienced, with mirror or reflective surface checking being a central component of BDD (Veale, 2004). When a person with BDD observes their own reflection, a negative appraisal of their internal body image (and in particular their main area of concern) is activated, due to their tendency to see themselves as an aesthetic object and to selectively direct attention towards their appearance (Veale, 2004). A negative appraisal can also be activated in other ways, by for example seeing the appearance of other individuals who the individual with BDD then compares themselves to, or through touching the body. Whilst the self as an aesthetic object is a central part of this model, to date this factor has not been measured directly in BDD, hence being focussed upon in the current study.

According to the above model, these factors in combination contribute to a negative perception of the individual's appearance, which leads to low mood, rumination around their perceived defects and desired appearance, and engaging in safety behaviours such as using

heavy make-up, or specific hairstyles / clothing to hide their perceived defective features (Veale, 2004).

Veale and Gilbert (2013) have recently discussed the function of safety behaviours which occur as part of BDD, proposing that such behaviours serve a protective function for individuals with BDD. Specifically, behaviours such as camouflage or comparing the self to other individual's are thought to protect the individual with BDD from social threats that they perceive, such as the likelihood of them being rejected or shamed by others on the basis of their perceived physical flaws (Veale & Gilbert, 2013). As well as the notion of safety behaviours playing a large role in the maintenance of BDD, research highlights that safety behaviours also dominate many aspects of everyday life for individual's with BDD.

Safety Behaviours and Mirror Use in BDD

Camouflage with make-up and clothing, skin picking, frequent mirror checking (with mirror avoidance reported in only a minority of cases; Phillips et al., 1993), and asking others for opinions and re-assurance have all been reported as common safety behaviours carried out by people with BDD (Veale, 2001). Bjornsson et al. (2010) state that these safety behaviours arise at times when thoughts around appearance become overwhelming, and function to reduce the distress felt as a result of these thoughts. Safety behaviours in BDD are reported to be of a compulsive nature and consume large amounts of time (Phillips, Gunderson, Mallya, McElroy, & Carter, 1998). A study carried out by Phillips et al. (1998) estimated that around 50% of people diagnosed with BDD spend over three hours per day engaged in safety behaviours.

Hrabosky, Cash, Veale, Neziroglu, Soll, Garner et al. (2009) investigated self-reported body image and self-management of appearance using questionnaire measures in a sample of 56 participants with a diagnosis of BDD, who were recruited from ten treatment centres across

the USA and England. When compared with data collected from participants with a diagnosis of anorexia nervosa (n = 35), bulimia nervosa (n = 26) and non-clinical controls (n = 70) results demonstrated that the BDD group experienced similar levels of overall body dissatisfaction as the two eating disordered groups, but also reported significantly higher levels of self-evaluation and time spent managing their appearance than any other group (Hrabosky et al., 2009).

Mirror gazing has been reported as an extremely common behaviour in BDD, and may range between extensively long mirror gazing sessions to brief multiple checks (Baldock, Anson, and Veale, 2012). In 2001 Veale and Riley reported that in a sample of 52 participants with BDD the average time spent gazing into a mirror as part of an 'extended session' was 73 minutes (in comparison to 21 minutes reported by 55 non-clinical participants). Veale and Riley (2001) also reported that the BDD group were more focused on an internal impression of their external appearance in the mirror, in other words how they felt about what they saw in the mirror, rather than their actual external reflection; this in turn led to most participants reporting a worsening of mood by the end of their mirror gazing session. One limitation of this study is that it relied on retrospective self-report of mirror gazing.

Interestingly, a study carried out by Windhelm, Veale, and Anson (2011) suggested that an increase in distress upon mirror-gazing is not unique to individual's diagnosed with BDD. Participants diagnosed with BDD (n = 25) and non-clinical controls (n = 25) were asked to look into a mirror for durations of 10 seconds and 10 minutes. Results demonstrated no significant between group difference in relation to reported level of distress in the 10 second condition, but significantly higher levels of distress in the non-clinical group in the ten minute condition. On the basis of these results, Windhelm et al. (2011) suggested that factors other than distress on seeing their reflection must differentiate individual's with BDD from individuals who do not experience the condition. One possible explanation proposed by Windhelm et al. (2011) is that

individual's with BDD experience a greater occurrence of negative thoughts, emotions, and memories related to their appearance than others when they look in a mirror, with a significant between group difference apparent in relation to this in their study. These more frequent negative intrusions may then lead to additional checking behaviours, maintaining excessive mirror use and the disorder itself. So whilst individuals with BDD and those without may experience the same level of distress upon mirror gazing, it appears they may connect to their reflection in the mirror in qualitatively different ways. It should be noted however that this idea is based on a relatively small sample (n = 25) and the results are also at odds with research by Veale and Riley (2001), which did not show elevated distress in control participants who retrospectively reported on a mirror gazing session.

As documented, BDD greatly impacts upon people's lives and also their behaviour. Vigorous attempts to control and conceal the deficits they perceive are made in order to try and improve mood and functioning, yet in fact Veale's cognitive model of BDD (2004) proposes that while such behaviours may reduce the perception of social threats and reduce distress in the short term (Veale & Gilbert, 2013) ultimately they contribute to the maintenance of the disorder and associated difficulties.

Treatment studies have lent support to the cognitive model, with a recent review highlighting various studies which support the efficacy of cognitive therapy as a treatment for BDD (Phillips & Rogers, 2011). Whilst evidence from treatment based studies support Veale's (2004) cognitive model of BDD, specific aspects of the model have been subject to very little empirical investigation. For example, the processing of the self as an aesthetic object is a central part of this model, yet this factor and what may be linked to its development in people with BDD has not been investigated in depth prior to the current study, despite having been demonstrated to contribute to body dissatisfaction in other contexts as will now be discussed.

Self-Objectification (the Self as an Aesthetic Object)

Seeing oneself as an aesthetic object, has been defined as an individual viewing themselves as something to be judged based on their external qualities by another (Frederikson & Roberts, 1997) or the extent to which an individual perceives their body with respect to its observable appearance compared with non-observable characteristics (Noll & Frederikson, 1998). Noll and Frederikson (1998) report that due to societal and cultural factors such as the level of importance attached to females' attractiveness and body shape, a significant part of living as a female within any society is the experience of being evaluated as a sexual object.

Fredrikson and Roberts (1997) put forward Objectification Theory which aims to outline possible consequences of living as a person who is routinely objectified. Fredrikson and Roberts (1997) suggest that not only does living within such a culture encourage females to objectify their own bodies and to evaluate them from the perspective of another individual, but also that females with a heightened sense of self-objectification are more prone to psychological distress and disorders. This idea has been supported by the work of Noll and Fredrikson (1998) who found that in two separate samples of female undergraduates who completed questionnaire measures (n=93 and n=111) high levels of self-objectification significantly predicted negative eating attitudes, greater bulimic symptoms, and higher levels of dietary restraint. Self-reported level of body shame partially mediated the relationship between self-objectification and the previously mentioned factors.

Whilst this work was carried out within relatively small and non-clinical samples of females, additional research within other non-clinical samples (Tiggermann & Lynch, 2001; Morry & Staska, 2001; Tiggerman & Kuring, 2004) and with participants diagnosed with eating disorders (Calogero, Davis, & Thompson, 2005) has also demonstrated a link between high levels of self-objectification and distorted / unhealthy body image.

As mentioned, Veale (2004) has proposed that heightened levels of self-objectification may exist in BDD, yet to date there is no empirical data to support this central aspect of the cognitive model, hence being one focus of the current study. His model stipulates that when an individual with BDD notices a visual representation of themselves (such as their own reflection), high levels of self-consciousness lead to the activation a distorted internal self-image, which is centred on sensory qualities and representations rather than other qualities which may be more abstract or verbal (Horowitz, 1970; cited in Veale, 2004). Veale (2004) states that the image is used to form an interpretation of how the person looks in the mirror and how others may evaluate them.

In 2004, Osman, Cooper, Hackmann, and Veale carried out a study investigating the spontaneous generation of mental imagery in participants diagnosed with BDD and matched controls (both groups n = 18), using a semi-structured interview and various questionnaire measures. There were no significant between group differences with regards to the self-reported likelihood of the groups experiencing the occurrence of spontaneous mental images linked to their physical appearance, however the BDD group experienced such images as significantly more distressing (Osman et al., 2004). Importantly, these images were also significantly more likely to be reported as being seen from an observer perspective (an individual looking at their own self-image from the perspective of another person) rather than a field perspective (an individual observing their own image looking out of their own body; Osman et al., 2004). Whilst Osman et al.'s (2004) work was carried out within a small sample of people diagnosed with BDD and must be interpreted tentatively, it supported the notion of the self being processed as an aesthetic object in BDD and its association to distress.

Given the previously reported studies which demonstrate a relationship between self-objectification and distorted body image in non-clinical individual's and individual's diagnosed

with eating disorders, and Veale's (2004) suggestion that self-objectification is a central component of the cognitive model of BDD, it is surprising that to date there has been no direct investigation of levels of self-objectification in BDD. The current study will be the first to measure self-objectification in individuals with this diagnosis.

In the cognitive model, it is proposed that heightened levels of self-objectification contribute to activation of negative appraisal of internal body image in BDD, which then leads to rumination and distress. Another aspect proposed by the cognitive model to contribute to activating this negative appraisal is selective attention, or heightened attention directed to the external body. Of these two factors, there is a wider range of research which has investigated selective attention to the external body in BDD than self-objectification.

Self-Focussed Attention

Veale's cognitive model (2004) also states that increased levels of self-focussed attention are apparent in people with BDD and may contribute to magnification of perceived flaws, and in turn to body dissatisfaction. Self-focussed attention can be defined as an awareness of information which whilst relevant to the self is generated internally (Ingram, 1990), such as thoughts, emotions, or images (Veale, 2004).

Veale (2004) has proposed that increased levels of self-focussed attention in BDD are linked to the individual's perceived negative physical image (Veale, 2004), with the person selectively attending to their external appearance rather than sensory feedback from their environment or body. So whilst this self-focus has an internal quality, in fact, it appears as though attention is being selectively directed towards specific external characteristics of the body and their distorted internal representation. Veale (2004) has hypothesised that in the most severe cases of BDD a person's attentional capacity may be entirely consumed by their

distorted self-image to the extent that they cannot focus on any other information regarding their body. This then leads to negative appraisals of their body image, and activation of cognitive assumptions regarding appearance being of central importance to the concept of the self above and beyond other attributes (such as values, goals, and personality; Veale, 2001).

In support of the notion of selective self-focussed attention in BDD various authors have reported differential attention and processing within this group. Feusner, Moller, Altstein, Sugar, Bookheimer, Yoon et al., (2010) used an experimental paradigm to investigate attention and processing in BDD. Eighteen people with a diagnosis of BDD and 17 matched controls performed a face recognition task where they were presented with normal or inverted faces for durations of 500ms or 5000ms, and then asked to select the face that had previously been presented to them on the screen from a choice of two faces (with inverted faces considered to be harder to process and recognise). Participants with a diagnosis of BDD displayed a significantly reduced impact of inversion of faces in the longer time condition, which Feusner at al. (2010) reported may be due to the fact that they engage in piecemeal and detail oriented processing of longer duration stimuli, such as detailed own facial analysis in mirrors. Other biases in attention have also been reported, such as selective attention for unattractive body parts, selective attention to emotionally salient cues, and increased sensitivity for subtle distortions in relation to facial features (Smeets, Jansen, & Roefs, 2011; Buhlmann, McNally, Wilhelm, & Florin, 2002; Stangier, Adam-Schwebe, Müller, & Wolter, 2008).

In 2000, Deckersbach, Savage, Phillips, Wilhelm, Buhlmann, Rauch, et al. investigated visual and verbal memory in 17 participants with a diagnosis of BDD using the Rey-Osterrieth Complex Figure Test and the California Verbal Learning Test. When compared to 17 non-clinical participants the BDD group showed poorer performance in both areas, with the authors suggesting that in both cases this was due to the tendency for participants with BDD to focus on

the details of the stimuli presented to them, rather than the whole stimulus. Whilst the small sample size means this finding should be interpreted with caution, it adds to the evidence provided by other studies suggesting that individual's with BDD may process stimuli in a different way.

In explanation of such results Feusner et al. (2010) have argued that people with BDD may have enhanced visual processing skills, whilst others have disputed this. For example, Reese, McNally, and Wilhelm (2010) reported that individual's with a diagnosis of BDD (n=20) were no more accurate at detecting facial asymmetry using actual faces or dot arrays than people with a diagnosis of OCD (n = 20) or healthy controls (n=20).

Further to this, Buhlmann, Rupf, Gleiss, Zschenderlein, and Kathmann (2013) carried out a recent study with participants with a diagnosis of BDD (n = 35), a dermatology complaint unrelated to BDD (n=35), and non-clinical controls (n=35) to investigate visual discrimination ability. Participants were presented with faces and objects which were either the same or had been altered, with regards to their symmetry, size, or colouring. The BDD group were not significantly better than any other group at detecting faces or objects where characteristics had been altered. Buhlmann et al. (2013) suggested that the results highlighted that people with BDD do not have increased visual discrimination ability. The study was somewhat limited however by the lack of control for comorbidities in the BDD sample, and the fact that not all participants with BDD listed facial features as their primary area of concern.

The body of research presented offers support to the notion of differential attention and processing existing in BDD, unlike proposed high levels of self-objectification, which have never been directly measured within this group prior to the current study. However, for both areas, other than the hypothesis of visual processing differences existing in BDD (which has received inconsistent support), the factors which may be linked to or underlie these concepts remain

unclear. Neziroglu, Kemlani-Patel, and Veale (2008) have called for further research which explores such aspects of the cognitive model of BDD.

The cognitive model and empirical research into BDD has focussed much more on cognitive and behavioural processes, with the exception of visual and perceptual processes. Virtually no research to date has investigated other potentially important processes, for example basic sensory processes such as proprioception and somatoperception, which are known to be share a relationship with negative body image and self-objectification (Pollatos, Kurz, Albrecht, Schreder, Kleemann, Schöpf et al, 2008; Ainley & Tsakiris, 2013), both of which are crucial components of BDD as proposed by the cognitive model (Veale, 2004). Indeed, Kaplan et al. (2013) have commented that new insight into the disorder might be gained through understanding of multisensory integration. One such basic process which it is proposed may be particularly relevant in BDD is interoceptive awareness, hence its investigation in the current study.

Interoceptive Awareness

Interoception has been defined as an awareness of the internal states and sensations of one's own body (Bechara & Naqvi, 2004) which can impact both consciously and unconsciously upon cognition and behaviour (Cameron, 2001). The idea that internal bodily signals impact upon our emotional wellbeing was suggested as early as the 19th Century, when James (1890) proposed that conscious being was connected to feedback received via bodily functions. Since then, a growing research base suggests that differences in individual's perceptions of their internal bodily signals may have an influence on how individual's experience emotions, with regards to their ability to regulate and perceive them (Furman, Waugh, Bhattacharjee, Thompson, & Gotlib,

2013). Damasio (1994) proposed the somatic marker hypothesis, which suggests that somatic signals which arise from the body contribute to emotions that individual's experience, how they direct their attention, and how they choose to respond in various situations, all of which impact on subsequent decisions in future situations.

Research has highlighted a relationship between levels of interoceptive awareness (IA) and a number of mental health conditions. A wide variety of studies have identified a positive relationship between anxiety and IA. Studies have demonstrated heightened levels of IA in both non-clinical participants with heightened levels of anxiety (Critchley et al., 2004; Pollatos et al., 2007) and clinical participants with a range of diagnoses such as social phobia, panic disorder, and generalised anxiety disorder (Domschke, Stevens, Pfleiderer, & Gerlach, 2010; Ehlers, Margraf, & Roth, 1992; Ehlers, Mayou, Sprigings, & Birkhead, 2000; Pineles & Mineka, 2005; Van der Does, Antony, Ehlers, & Barsky, 2000; Wald & Taylor, 2005; Zoellner & Craske, 1999). Pollatos et al. (2007) suggest that individual's with higher levels of IA are likely to display heightened reactions to emotional stimuli as they are more in tune with their bodily feedback. Various authors have postulated that this increased awareness of somatic bodily sensations, and their subsequent appraisal as a threat to the self, contribute to the development and maintenance of anxiety disorders (Ehlers et al., 1992; Domschke et al., 2010).

In a recent review of the literature related to anxiety and IA Domschke, et al. (2010) reported that evidence to date does support the notion of increased levels of IA in studies using participants with a clinically diagnosed anxiety disorder. However, Domschke et al. (2010) commented on the reliance of self-report measures of IA in many studies that have identified heightened levels of IA in anxiety disorders, and they report that the evidence base could be strengthened through the use of experimental and therefore more objective measures of IA.

More recent studies which have investigated interoceptive awareness (IA) have frequently done so using an experimental task, namely a heartbeat detection task, to measure levels of IA. This task involves participants actual heart rate being measured using a small recording device which is attached to a part of their body where a pulse can be detected. At the same time they are asked to estimate their own heartbeat across separate time periods using mental tracking and without feeling their pulse. A mathematical calculation allows an estimate of the discrepancy between these two figures, giving an indication of a person's level of IA, and producing a score ranging from 0 to 1. A high level of IA would be indicated where an individual's estimates of their heart rate across time periods are close to their actual recorded heart rate in each period (Pollatos et al., 2008). This would be indicated as a score close to 1, with a higher score representing an individual who has a good connection with their internal bodily signals. This method has been demonstrated to be a valid and reliable indicator of individual's levels of IA. (Tsakiris, Tajadura-Jiménez, & Constantini, 2011). Research has shown that heartbeat detection correlates with the ability to detect changes in various organs of the body (Whitehead & Drescher, 1980), namely visceral and respiratory awareness (Harver, Katkin, & Bloch, 1993; Herbert, Muth, Pollatos & Herbert, 2012).

Whilst BDD is an anxiety disorder it is suggested that unlike previous research with anxiety disordered groups, participants with BDD will demonstrate low levels of IA. This is suggested on the basis of this group's specific connection to the external body, and in light of the research yet to be discussed investigating IA and its relationship with self-objectification, self-directed attention to the external body, and emotional awareness.

In addition Dunn, Stefanovich, Evans, Oliver, Hawkins, & Dalgleish (2010) demonstrated a relationship between mood disorders and IA in sample of 113 individual's aged 18-65 years with no known clinical diagnosis and varying levels of anxiety and depression symptomology. As

well as completing questionnaires to assess such symptoms, participants were asked to complete the heartbeat detection task previously described to measure their level of IA. Dunn et al. (2010) reported that as anxiety specific symptoms increased so did levels of IA, whereas depression specific anhedonia shared a negative relationship with IA. Dunn, Dalgleish, Ogilvie, and Lawrence (2007) have also reported the potential restorative effect that antidepressant medication may have on reduced levels of IA in depression.

The relationship of IA with depression, and medication (which is often used in the treatment of BDD; Gupta et al., 2013) is also important to consider, given that individual's diagnosed with BDD frequently experience co-morbid mental health conditions as discussed previously. While the current study aims to investigate the relationship between BDD and IA, it is likely that many participants diagnosed with BDD may experience co-morbid depression, and may also be taking prescribed medication.

Interoceptive awareness and the external body.

Research has highlighted that levels of IA are linked to exteroceptive awareness, namely a person's external perception of the body. Tsakiris et al. (2011) demonstrated that individual's levels of IA (how good they were at sensing their internal bodily signals) were also predictive of the malleability of their exteroceptive awareness. Tsakiris et al. (2011) used the heartbeat detection task described previously to measure IA in 46 female undergraduate students. Tsakiris et al. (2011) also employed the Rubber Hand Illusion (RHI) paradigm (a measure of multisensory integration; Botvinick & Cohen, 1998), whereby each participant had one of their own hands hidden, with a prosthetic hand taking the position their own hand usually would. The researcher then stroked both the rubber hand and the participants opposite hand simultaneously, inducing an illusion of ownership of the rubber hand. Tsakiris et al. (2011) reported that participants who demonstrated lower levels of IA (less awareness of internal bodily

signals) reported higher levels of felt ownership of the rubber hand as part of their own body, as indicted by their ratings when asked how much they perceived the rubber hand to be their own, and also a decrease in their body temperature as measured on their own hand.

Whilst the sample in this study was relatively small Ainley, Maister, Brokfield, Farmer and Tsakiris (2013) have postulated that such evidence which demonstrates a relationship between interoceptive and exteroceptive awareness, means people with lower levels of IA may have a more malleable external sense of self on the basis of bodily signals that they receive. People with BDD could also be described as individuals who tend to misperceive their external body, and it is possible that low levels of IA occur within this population.

With regards to clinical populations and presentations, a commonality can be seen between BDD and eating disorders, with both having exteroceptively driven self-representation and high levels of distress related to their external bodies (Hartmann, Greenberg, & Wilhelm, 2013). Various authors have reported reduced levels of IA in participants with a diagnosis of anorexia nervosa (AN; Fassino, Pierò, Gramaglia, & Abbate-Daga 2004; Lilenfeld, Wonderlich, Riso, Crosby, & Mitchell, 2006; Matsumoto et al., 2006) on the basis of a questionnaire measures of IA. In 2008, Pollatos et al., used the heartbeat detection task reported previously, and demonstrated that females with a diagnosis of AN (n=28) had significantly lower levels of IA than matched controls (n = 28). Pollatos et al. (2008) postulated that as a result of a weaker connection to internal bodily signals, participants with anorexia nervosa may receive less feedback and signals to process from their internal body, which may be linked to their pathology and maintenance of the strong connection with the external body. In light of this evidence, it is suggested that individual's with BDD may display lower levels of IA than people without this disorder, and that this disconnection with the internal body may contribute to the misperception of and pre-occupation with features of the external body.

As well as low levels of IA being linked to increased malleability of representations of the external body, the malleability of the external body has also been demonstrated to share a relationship with body dissatisfaction. Mussap and Salton (2006) reported that in a group of 128 non-clinical participants, variance in unhealthy body development in males, and bulimic symptomology in males and females (as measured using self-report questionnaires) was partially explained by how susceptible participants were to the RHI paradigm, demonstrating the existence of a relationship between dissatisfaction with body image, somatoperception, and malleability of external body representation.

Further to this Kaplan, Rossell, Enticott, Howhy, & Castle (2012) have published data which demonstrated that participants diagnosed with BDD, who experience perhaps the most extreme form of body dissatisfaction, were significantly more susceptible to the RHI paradigm. When compared to non-clinical participants (n =15), participants with BDD (n=16) were significantly more likely to report the rubber hand as feeling like their own, regardless of whether the rubber hand was stroked synchronously with their own hand (the condition thought to induce the illusion) or asynchronously. Kaplan et al., (2012) hypothesised that the differences observed may be due to the different ways in which the external body is viewed and processed by participants with BDD, and it is suggested that another factor that could be linked to this finding may have been low levels of IA in the BDD group, on the basis of previously reported research which demonstrates a relationship between malleability of bodily representation to low levels of IA and body dissatisfaction.

As well as low levels of IA being linked to high levels of body dissatisfaction, more easily altered perception of the external body, and AN (where the external body is selectively focussed on much as is observed in BDD) recent research has reported a relationship between IA and

levels of self-objectification, which as described previously is an important component of Veale's (2004) cognitive model of BDD.

Interoceptive awareness and self-objectification.

Ainley et al. (2013) investigated IA as measured using the heartbeat detection paradigm in a group of 47 female undergraduate students, and asked them to also complete a questionnaire which measured their levels of self-objectification. Ainley and Tsakiris (2013) reported a significant negative correlation between IA and self-objectification in this group. Whilst the sample was small and non-clinical it is the first to draw a direct link between IA measured experimentally and self-objectification. Ainley et al. (2013) suggest that individual's with high levels of self-objectification who are prone to processing the self from an observer perspective have less attentional capacity to direct towards their internal bodily signals. On the basis of Veale's cognitive model (2004) which implicates self-objectification, it is proposed that Ainley et al.'s (2013) results highlight not only the importance of investigating levels of IA in BDD, but also the link between levels of IA and self-objectification in BDD, another focus of the current study.

In addition to this, Eshkevari, Rieger, Longo, Haggard, and Treasure (2012) used the RHI with a sample of 78 females who had a diagnosis of an eating disorder, as well as administering self-report questionnaires to measure eating disorder pathology, interoceptive disturbance, self-objectification, depression and anxiety. In comparison to 61 non-clinical control participants the eating disorder group experienced the RHI significantly more strongly, both in synchronous and asynchronous stroking conditions. Also, self-reported low levels of IA and high levels of self-objectification were significant predictors of how strongly the rubber hand illusion was experienced as part of the participants' own bodies, which the authors proposed may explain this result. Eshkevari et al. (2012) reported that the tendency to view oneself from a third person perspective (heightened self-objectification) may contribute to the development of a

different relationship to the internal and external body. Therefore, it seems plausible that similar patterns may be observed in individuals diagnosed with BDD.

As well as a relationship with the external body and how it is perceived, other research has highlighted the role that interoceptive awareness plays in identifying and experiencing emotions, and the ability to regulate and react to emotions. On the basis of research discussed previously which identifies high rates of comorbid depression and suicide attempts in BDD (Veale et al., 1996: Gunstad et al., 2003; Phillips et al., 2006), it is suggested that individual's with BDD may find it more difficult that others to regulate emotions and levels of distress.

Interoceptive awareness, emotional recognition, and distress.

Links have been drawn between IA and how intensely emotions are experienced by individuals. This has been reported both on the basis of self-ratings of arousal (Pollatos, Traut-Mattausch, Schroeder, & Schandry, 2007) and also through more objective measurements of arousal, for example patterns of electroencephalographic activity during periods where individuals were processing emotional stimuli (Herbert, Pollatos, & Schandry, 2007). Such studies have demonstrated that individuals with heightened levels of IA also report and display heightened levels of emotion perception.

As well as the experience of emotion, Werner, Kerschreiter, Kindermann, & Duschek (2013) recently published research which they suggest indicates that individual's with high levels of IA are more able to regulate their emotions. Fifty-eight male (n = 31) and female (n = 27) undergraduate students had their levels of IA measured using the heartbeat detection task, and were then placed into social situations with confederates where they were both included and excluded from group discussions. Following this task, participants with heightened levels of IA showed a smaller reduction in self-reported positive affect and feelings of acceptance, and a

smaller increase in negative affect and perceived rejection. Werner et al. (2013) postulated that their increased ability to connect to physiological feedback from their own bodies allowed a healthier response to their emotions. The results of this study would suggest that people with lower levels of IA may be less able to regulate their responses to their own emotions.

If people with BDD are demonstrated to have lower levels of IA, it may be that once activation of negative appraisal of internal body image occurs, lower IA may be contributing to distress through its association with difficulties regulating emotions.

Whilst a full discussion of the possible neurological basis of IA is out of the scope of the current chapter, it is worth highlighting that research carried out to date has implicated the right anterior insula as an area of particular importance with regards to the integration of interoceptive and exteroceptive signals (Craig, 2010). As well as activity in this brain area correlating with IA (Critchley, Weins, Rotshtein, Ohman, & Dolan, 2004: cited in Ainley et al., 2012), the right anterior insula has also been noted as being active during own face recognition (Devue and Brédart, 2011).

Further to this, people who have sustained neurological damage to the insula have been reported to have impaired emotion recognition (Verdejo-Garcia, Clark, & Dunn, 2012). Manjrekar and Berenbaum (2012) reported that increased clarity of emotion, associated with greater insula activity, has been shown to be linked to greater levels of body satisfaction and lower levels of body distortion within the general population. Buhlmann, McNally, Etcoff, Tuschen-Caffier, and Wilhelm (2004) found that a group of individual's with BDD (n = 20) had significant difficulty identifying emotional expressions when asked to recognise emotions on the basis of facial cues presented to them compared to control participants (n = 20) but not when compared to participants with a diagnosis of OCD (n = 20). In addition, participants diagnosed with BDD were more likely to misinterpret faces as angry or contemptuous than participants with

a diagnosis of OCD (Buhlmann et al., 2004). In 2006 Buhlmann, Etcoff, and Wilhelm reported finding this same emotion recognition deficit in a different group of participants diagnosed with BDD (n = 18; control participants n = 18), with the effect being most pronounced in self-referent scenarios. Other work has also highlighted that abnormal emotion recognition may exist in BDD, with Feusner et al., (2010) reporting abnormalities in the speed and accuracy of processing faces with emotional expressions. A limitation of this study however was high levels of co-morbid depression in the BDD group, which may have accounted for slowed reaction times (Feusner et al., 2010). One explanation for such findings may be linked to abnormal piecemeal visual processing in BDD which has been discussed previously. However, an alternative or complimentary hypothesis may be that differential IA and processing in the right anterior insula could explain emotion recognition deficits observed in BDD.

Low levels of IA have been linked to a reduced ability to regulate emotions, and neurological damage to an area considered to be crucial for the integration of internal and external bodily sensations (right anterior insula; Craig, 2010) has been shown to be linked to impaired emotion recognition. Individual's with BDD experience strong emotions in relation to their appearance which quality of life and outcome research would suggest they find difficult to regulate. In addition, research has identified that individual's with BDD may indeed have impaired emotion recognition.

Traditionally, IA has been thought of as a trait rather than state variable (Anthony, Meadows, Brown, & Barlow, 1994) as it is considered to be robust and demonstrates good test-retest reliability (Mussgay, Klinkenberg, & Ruddel, 1999). However, more recent research has questioned this assumption, and raised the possibility that IA may be somewhat modifiable, which in turn could have implications for the treatment of psychological distress.

Interoceptive awareness: trait or state?

In 2001, Silvia and Gendolla proposed the Perceptual Accuracy hypothesis, which stated that any increase in self focused attention should lead to an improvement in the ability of an individual to judge characteristics of their body and also cognitions. Ainley et al. (2012) tested this hypothesis experimentally, exploring the effects of self-focus on IA. They asked 105 non-clinical participants to complete the heartbeat detection task previously described whilst facing a blank screen 40cm away from them. Participants then completed the same task whilst facing a mirror at the same distance, in an attempt to manipulate self-focussed attention (Scheier, Carver, & Gibbons, 1979; Gibbons, Caver, and Scheier, 1979; both cited in Ainley et al., 2012). Ainley et al. (2012) then separated participants into groups of high IA and low IA by employing a median split on the data collected, and found that for participants who began with low IA only, their ability to connect to their internal bodily signals, and their IA performance, improved significantly in the mirror condition.

Whilst this was the first study of this nature and should be interpreted tentatively, it may indicate that improving IA is possible with training, and the possibility exists that through this training people's exteroceptive awareness could also be improved, with research demonstrating a relationship between the two. Ainley et al. (2012) have further speculated that the anterior insula may be the neural mechanism by which this process occurs, acting as a pathway where direction of attention was switched from the external environment to the internal self and body, with previous research demonstrating a correlation between heartbeat awareness and brain activity and volume in this area (Critchley et al., 2004; in Ainley et al., 2012). This would be of relevance in BDD since it could facilitate a shift in attention away from the self-focus on the external body to other tasks or areas, one of the stated goals of cognitive behavioural treatment of BDD (Veale, 2004).

The work of Ainley et al. (2012) supports the idea of modification of levels of IA through increased visual self-focussed attention, using a mirror to facilitate this process. However, for those diagnosed with BDD, theoretical models and research studies postulate that time spent gazing into mirrors ordinarily leads to a strengthened belief in a deficit that others cannot perceive. It therefore seems plausible to suggest that in this population of individual's, the external body and focus of attention may share a different relationship with the internal body. As well as investigating blank screen levels of IA in individuals diagnosed with BDD using the heartbeat detection paradigm, the current study will also be the first to explore the impact of gazing into a mirror on levels of IA in BDD.

Whilst previous work has highlighted an improvement in performance of individual's with low levels of blank screen IA following the introduction of a mirror, it is predicted that the introduction of a mirror in the heartbeat detection task with individual's with BDD will further impede their performance as they focus more on their perceived external appearance.

Summary of Literature Reviewed

BDD is a prevalent disorder which is unrecognised and under-diagnosed in comparison to other mental health conditions. Whilst some advances in understanding BDD have been made in recent years, much remains unknown about the disorder. Greater awareness of BDD and further research into the disorder is vital in order for individuals with BDD to receive appropriate and timely treatment. This seems especially important when considering the reported impact of BDD for individual's with this diagnosis.

Veale (2004) proposed the cognitive model of BDD to explain factors which he believes contribute to the maintenance of the disorder. Whilst treatment trials which have been conducted support the efficacy of CBT for BDD (Phillips & Rogers, 2011), the cognitive model

would further benefit from empirical research which aim to measure its proposed central characteristics. One central aspect of the model suggests that individuals diagnosed with BDD are likely to display heightened levels of self-objectification, yet to date this has not been explored directly. In addition to this, there has been a minimal amount of research which has attempted to explore underlying factors which may contribute to the perceptual and processing differences which have been identified as existing in BDD. Authors such as Kaplan et al. (2013) and Neziroglu et al. (2008) have proposed that more research testing current models of BDD and also research which aims to investigate basic sensory processes, such as the integration of internal and external body information in BDD is needed to move the field forward.

Research into IA has highlighted the importance of awareness of the internal body for emotional wellbeing. Studies in this area have demonstrated that individuals who struggle to identify their internal bodily signals are more likely to have heightened body dissatisfaction, are more pre-occupied with their external body, are more susceptible to misperceive aspects of their own body, are less able to regulate their own emotions, and report heightened levels of self-objectification. In addition, research with individual's diagnosed with eating disorders has highlighted low levels of IA within this population. Despite the fact that low levels of IA have been associated with such factors which are commonly observed in BDD, and have been proposed as part of a theoretical model of BDD, there are no studies which have measured IA in individuals with BDD.

Furthermore, recent work by Ainley et al. (2013) reported that levels of IA may be modifiable, by increasing the self-focus of individual's with low levels of IA. This manipulation was achieved by asking individual's to focus on their reflection in a mirror. The idea that levels of IA could be improved or modified may have clinical utility in disorders where individuals are pre-occupied with their external body. However, the impact of using a mirror to increase self-

focus and ultimately levels of IA has not been tested within any clinical populations. Investigating the utility of this method in BDD seems important, as the reaction of individual's with BDD to their reflection is proposed to be markedly different to those without this disorder. Veale's (2004) cognitive model proposes that heightened self-focussed attention on the external body in fact contributes to distress regarding perceived physical flaws, and in part maintains the disorder.

Proposed Study

The aim of the current study was to investigate levels of self-objectification, levels of self-focussed attention, and levels of IA in participants diagnosed with BDD, and to explore whether levels of IA are modifiable within this population through the introduction of a mirror in order to answer some of the questions previously posed.

In order to achieve this aim, three groups of participants were recruited, namely; participants diagnosed with BDD, participants diagnosed with a mixture of other anxiety disorders, and participants with no known diagnoses (non-clinical participants). The reason for the inclusion of the anxiety group was to compare the BDD group to another group of individual's who could also be categorised as having an anxiety disorder. Literature which was discussed earlier in the chapter has demonstrated that individual's diagnosed with anxiety disorders tend to display elevated levels of IA (see Domschke et al., 2010 for a review). Up until the recent introduction of DSM-V (where BDD is now classified as an obsessive compulsive disorder) BDD was also classified as an anxiety disorder. However, it is proposed that the BDD group will not demonstrate elevated levels of IA as has been seen across other anxiety disorders. Therefore, it was considered helpful to have an anxiety control group to attempt to investigate the differences between these two populations in relation to levels of IA. To measure levels of IA, participants were asked to complete the heartbeat detection task discussed

previously in order to measure their level of IA whilst looking at a blank screen (condition one). Participants were also asked to complete the same task whilst looking at their reflection in a mirror (condition two), following the procedure described by Ainley et al. (2012).

In addition participants were asked to complete a self-report questionnaire to measure their perceived level of self-objectification (Self-Objectification Questionnaire; Noll & Fredrickson, 1998) and their focus of attention (Focus of Attention Questionnaire; Woody, 1996). Participants were also asked to complete questionnaires which measured levels of current anxiety (Generalised Anxiety Disorder scale; GAD-7, Spitzer, Kroenke, Williams, & Lowe, 2006) and levels of depression (Patient Health Questionnaire-9; PHQ-9, Kroenke, Spitzer, & Williams, 2001), as these factors are known to also share a relationship with levels of IA, and may therefore impact upon results.

Participants also completed the Cosmetic Procedure Screening Questionnaire for Body Dysmorphic Disorder (COPS; Veale, Ellison, Werner, Dodhia, Serfaty, & Clarke, 2012) in order to measure BDD symptomology and screen for such characteristics in the anxiety and non-clinical groups. The COPS also allows the calculation of BMI, with this factor also demonstrated to share an inverse relationship with levels of IA in previous research (Ainley et al., 2012). The GAD-7 and PHQ-9 were also used as screening tools for participants in the non-clinical group.

The hypotheses of the study were as follows;

Hypothesis 1

On completion of the blank screen condition (condition one) of the heartbeat detection task the BDD group will display the lower levels of IA than the anxiety group and the non-clinical group. The anxiety group will display the highest levels of IA.

Hypothesis 2

On completion of the mirror condition (condition two) of the heartbeat detection task the BDD group will display lower levels of IA than the anxiety group and the non-clinical group. In addition, in comparison to the blank screen IA condition, levels of IA in the BDD group will decrease, while levels of IA across the anxiety and non-clinical groups will increase.

Hypothesis 3

3 a) The BDD group will display higher self-objectification scores than the anxiety and non-clinical groups. 3 b) Further to this, across the groups, there will be an inverse relationship between levels of self-objectification and levels of IA.

Hypothesis 4

There will be an inverse relationship between levels of self-focussed attention and levels of IA within the BDD group.

It should be noted that hypotheses 3 b) and 4 are tentative and exploratory hypotheses. In the context of the current study these hypotheses could not be tested fully given the level of recruitment and the resulting lack of power for correlational analyses, but it was thought interesting and relevant to investigate these variables briefly in a small sample. Whilst no

causality can be attributed on the basis of this design, this will be the first study to explore these factors in BDD and on the basis of the evidence discussed it is suggested that the results may provide a valuable contribution to the current understanding of BDD.

Chapter 2: Method

Design

The study utilised a cross-sectional design, and compared three groups of participants; individual's diagnosed with body dysmorphic disorder (BDD), individual's diagnosed with anxiety disorders, and individual's without any clinical diagnoses. Quantitative data was collected, and which was analysed using statistical methods.

Participants

Power calculation.

A power analysis was conducted prior to data collection, to establish the sample size required to detect an effect similar to comparable studies. The current study was novel, as no previous studies have investigated interoceptive awareness (IA) in BDD. Therefore power was calculated using a previous study investigating IA in anorexia nervosa carried out by Pollatos et al. (2008) as theoretically this was the most comparable clinical sample and study available. Pollatos et al. (2008) reported a mean IA score of .68 for the anorexia nervosa group, and a mean score of .77 for the non-clinical group. The standard deviation for the anorexia group was used (SD = .18) for the power calculation; (.77-.68) / .18 = .50. This indicated a large effect size (>.40) as defined by Cohen (1992) for analyses using ANOVA. For an alpha level of 0.05 and power of 0.80 it was estimated that 25 participants would be required in each of the three groups.

Recruitment.

Recruitment of clinical and non-clinical participants took place simultaneously over a six month period. Informed consent was obtained for all participants prior to the testing procedure commencing. There were no service users who were deemed as incapable of providing

informed consent either by clinicians where relevant and the researcher at the time of testing. Participants were given an identifying number for the study, which was used on all materials to ensure anonymity and confidentiality. Prior to testing commencing, it was explained to clinical participants that if any issues of clinical risks were raised, the researcher would need to speak with their clinician regarding these concerns. No significant risk issues were identified during the testing procedure for any of the participants.

Clinical participants.

A total of 16 adults diagnosed with body dysmorphic disorder were recruited from one inpatient and one outpatient service in a London NHS foundation Trust, and a London based BDD support group. Fourteen of these individual's had received an official diagnosis from their mental health services, and two individual's self-reported that they had been diagnosed with BDD by a mental health professional. Twenty six adults diagnosed with an anxiety disorder were also recruited from the same outpatient and inpatient services within a London NHS Foundation Trust and from a London based anxiety support group. Of these individual's 20 had received an official diagnosis from their mental health services, and six individual's self-reported that they had been diagnosed with an anxiety disorder by a mental health professional.

A further 16 individual's with BDD and 19 individual's with anxiety were approached by their clinicians at the London based outpatient service, but decided not to participate in the study. At the London based inpatient service, 2 individual's with BDD and 6 individual's with anxiety were approached by their clinicians but decided not to participate in the study. In addition, 15 individual's with BDD and around 40-50 individual's with anxiety attending London based support groups for their difficulties received information on the study but did not contact the researcher to discuss the study further or express an interest in participating.

Inclusion criteria for both clinical groups were; adults aged 18-65 years with a diagnosis of BDD or an anxiety disorder, as diagnosed by a mental health professional. Participants were required to be able to read and write in English, and be capable of informed consent. Exclusion criteria included risk, and a co-morbid diagnosis of an eating disorder.

In total 14 participants in the BDD group were engaged in psychological therapy with their mental health team at the time of testing, and the remaining 2 participants reported receiving psychological therapy within the last 12 months. In the anxiety group 20 participants were also receiving psychological treatment from their mental health team at the time of testing, with 6 participants in this group reporting that they had received psychological therapy treatment in the last 12 months.

Service users under the care of a mental health service who met inclusion criteria were approached by their individual clinicians (either psychologists or cognitive behaviour therapists). Service users were given a verbal explanation of the study by their clinician as well as the participant information sheet (Appendix 1). If service users were interested they were asked to contact the researcher using the telephone number on the information sheet, or if they preferred they could give their verbal consent for the researcher to contact them.

Participants who were recruited through support groups were sent a participant information sheet by the facilitator of their group, and also given a verbal explanation of the study by the researcher who attended support group meetings. Again, if people attending the support groups were interested in participating they were asked to contact the researcher using the telephone number on the information sheet.

The researcher met with service users either at the premises of their mental health service where they were receiving treatment or at the base where their support group took

place. Participants were reminded that participation was entirely voluntary, and that they were free to leave questions unanswered and withdraw their participation at any point, and without giving any reason (without any impact upon their clinical care where relevant).

Data was collected during one meeting with the researcher lasting 45 minutes to one hour. At the time of the meeting written informed consent was obtained (Appendix 2). Questionnaires and experimental conditions were administered in a counterbalanced manner, to control for order effects (Ainley et al., 2012). Participants received a verbal debrief at the end of the testing session, and were also given a debrief sheet containing details of the study, contact details of the researcher and lead clinicians, and other relevant sources of support (Appendix 3). Participants in the clinical groups were not compensated for their time, but were entered into a prize draw where a total of eight cash prizes were available. It was made clear to participants verbally that the prize draw was not a benefit of taking part in the study.

Non clinical control participants.

A total of 23 adults living in the same geographical location as the mental health services and support groups from where clinical participants were recruited, were recruited through opportunistic sampling. In addition 6 undergraduate psychology students were recruited from Royal Holloway University, Surrey. Student participants were recruited as part of an academic programme, where students received course credits for their participation in research projects. Non-clinical participants were selected in order to approximately match the clinical groups for age, gender, educational level, and employment status. Non-clinical controls were excluded if they reported past of current history of mental illness, scored at above ten on the Patient Health Questionnaire 9 (Kroenke, Spitzer, & Williams, 2001) and the Generalised Anxiety Questionnaire 7 (Spitzer, Kroenke, Williams, & Lõwe, 2006) respectively, or scored above 40 on

the Cosmetic Procedure Screening Questionnaire (COPS; Veale, Ellison, Werner, Dodhia, Serfaty, & Clarke, 2012).

Non-clinical participants who were recruited through opportunistic sampling were sent a participant information sheet (Appendix 4) as an email, and contacted the researcher if they were willing to participate. Participants who were undergraduate students received a brief description of the study via an electronic participant information system used by their University, which advertised studies that were available for undergraduate students to take part in to receive module credits. Upon meeting with non-clinical participants either at Royal Holloway University premises, or homes and community centres in and around London, the same data collection and experimental procedure was followed as described above (see Appendices 5-7 for relevant participation materials). Non-clinical participants who were undergraduate students received two credits which contributed to the fulfilment of a course module for their participation. Non-student control participants were not compensated for their time.

Procedure.

Participants met with the researcher who gave them a brief verbal outline of the study and what they would be asked to do, as well as giving them a copy of the relevant participant information sheet for them to read over again. Once participants had read the information sheet they were asked whether they had any questions. If participants had questions regarding the study and procedure these were answered before they moved on to complete the participant consent form. Once participants had completed the participant consent form and agreed to participate they began the study. Participants completed the interoceptive awareness task (both the blank screen (condition 1) and mirror (condition 2) conditions, with conditions counterbalanced across participants. They also completed the questionnaire measures which were listed in the chapter 1. The questionnaires were competed as a set, with the exception of

the focus of attention questionnaire. This was always completed straight after the IA task had ended, as the questionnaire has been designed to measure a person's focus of attention following the completion of a 'task'. Following the completion of both the IA task and all questionnaires participants were given the relevant participant debrief sheet and organisations they could contact, and they were also given a verbal debrief. Again, participants were asked if they had any questions regarding the study, and if so these were discussed. Participants were then thanked for their time and left the research session.

Ethical Considerations

Ethical approval for the study was obtained from a London NHS Research Ethics Committee (ref: 13/LO/0760), the Research and Development Offices of a London NHS Foundation Trust (ref: 2013/038), and the Psychology Departmental Ethics Committee at Royal Holloway, University of London (ref: 2014/071R1) (see Appendices 8-10 for relevant documents). A risk management protocol was also drawn up by the author and supervisors, and was agreed with the clinical sites from where participants were recruited (Appendix 11).

Measures

Demographic information.

Participants in all three groups were asked to provide the following demographic information; age, gender, ethnicity, relationship status, education level, employment status, current or previous diagnoses of mental health conditions, and any medication prescribed in relation to these diagnoses. In addition, participants in both clinical groups were asked to report current diagnoses (including co-morbidities), length of time since initial diagnoses, and whether they had received psychological treatment within the last 12 months.

Measurement of Interoceptive awareness.

Heartbeat detection task.

A heartbeat detection task was used to measure interoceptive awareness (IA) of participants in all three groups. Individual participant's heart rates were acquired using a Polar ProTrainer recording device, where participants placed their wrists on a pulse detection strap (Appendix 12) in front of them, which recorded the total number of heart beats over the duration of the task and total number of heart beats during each trial. Data was recorded by a Polar watch (Appendix 13) which was held by the researcher throughout the duration of the task, and then transferred to a laptop computer via infrared technology for storage. Data transferred to the laptop contained no information which could identify any individual participant. This equipment was selected as it allowed the recording of participant's heart rates as per the procedure of previous IA studies, and was also portable, which allowed the researcher to meet with participants across a variety of research sites.

The researcher gave participants instructions for the Mental Tracking Method (Schandry, 1981; in Ainley et al., 2012), where participants are asked to estimate their own heart rate. Participants were given standard instructions as previously used by Ehlers and Breuer (1996) and Ainley et al. (2012), where they were asked to concentrate hard to try and silently count their own heartbeats by listening to their body, without taking or having any indication of their pulse. The beginning and end of each heartbeat counting trial was indicated by a noise emitted from the watch being held by the researcher, who was sat behind participants (facing the opposite direction) throughout the duration of the task. At the end of each trial, participants were asked to verbally report the number of heartbeats that they had silently counted which was then recorded by the researcher.   Participants were given a practice trial to clarify that they

understood the task and to ask any questions prior to beginning the experimental trials. Participants received no feedback on their performance during practice or experimental trials.

The experimental task involved two conditions, namely a blank screen condition and a mirror condition, to allow the manipulation of attention to the self as employed by Ainley et al. (2012) and described in chapter 1. In the blank screen condition, participants were asked to gaze at a black screen (measuring 30cm by 50cm) which was placed 40cm in front of them at eye level whilst completing the IA task described above. In the mirror condition participants were required to complete the same task, but were instructed to gaze at their own reflection in the same size mirror again placed 40cm in front of them. Each condition consisted of four trials lasting 25, 35, 45, and 100 seconds in time, following the protocol of previous studies (e.g. Pollatos et al., 2008). Participants were not given information on the length of any time intervals. Time intervals and order of conditions were counterbalanced to account for order effects. The discrepancy between the recorded number of heartbeats and number of heartbeats estimated by a participant during each trial allows the calculation of level of interoceptive awareness in each experimental condition using a mathematical formula {1/3   [1 - (|recorded heartbeats – counted heartbeats|/recorded heartbeats)]}. Final IA scores range from 0 to 1, with scores closer to one (higher scores) equalling higher interoceptive awareness. This method of assessing IA has good test re-test reliability and correlates with other tasks measuring heartbeat detection (Knoll & Hodapp, 1992; cited in Tsakiris et al., 2011). As part of this procedure, participants were also asked to rate on a likert scale (from 0 to 10) how much they managed to concentrate on monitoring their heartbeats in each condition, and focus on the blank screen or their reflection in the mirror ahead of them (dependant on condition). In both cases a score of 10 represented the highest level of concentration.

Measurement of self-objectification.

Self-Objectification Questionnaire (Noll & Fredrikson, 1998).

The self-objectification questionnaire (SOQ; Noll and Fredrikson, 1998; Appendix 14) was used to measure self-reported self-objectification, or the extent to which an individual perceives their body with respect to its observable appearance compared with non-observable characteristics (Noll & Frederikson, 1998). The questionnaire asks participants to rank 10 body attributes with regards to how much each aspect is important to them and impacts on their feelings of self-worth, with rank 1 having the most impact and rank 10 having the least impact. Five attributes are related to appearance (physical attractiveness, weight, sex appeal, muscle tone, measurements, and colouring) and five attributes are related to body competence (health, physical fitness, muscular strength, physical coordination, stamina, and energy level). An overall self-objectification score is calculated by summing the ranks for each set of attributes separately, and then calculating a difference score, leading to scores which range between -25 to 25 (Noll and Fredrikson, 1998). Higher scores are indicative of greater self-objectification. The scale has been demonstrated to have high test-re-test reliability (r =.92; Fredrikson, 1999) and satisfactory construct validity (Noll & Fredrickson, 1998). The SOQ is a widely used self-report measure of self-objectification (Noll & Fredrikson, 1998; Calogero et al., 2005; Ainley et al., 2013).

Measurement of focus of attention.

Focus of Attention Questionnaire (Woody, 1996).

The Focus of Attention Questionnaire (FAQ; Woody, 1996; Appendix 15) measures the extent to which an individual's attention is focussed on themselves or towards others within a social situation. The questionnaire is comprised of two scales which separately measure self-focus and external focus. Each scale consists of five items which each describe an area attention could have been focussed on in a social situation (for example, physical surroundings or own feelings of anxiety) and individual's are asked to rate to what degree they were focussing on each area on a five point scale from 1 (Not at all) to 5 (Totally). Subscale scores are calculated by adding together the five items for each scale independently and then calculating a mean score for each scale, with a higher score indicating higher levels of attention. Woody, Chambless, and Glass (1997) reported adequate internal consistency for the internal (.72 Cronbach's alpha) and external (.76 Cronbach's alpha) scales, and Woody (1996) has demonstrated that the measure is sensitive to attentional manipulations, supporting acceptable construct validity. This measure has been used by a variety of previous research studies to measure focus of attention (Woody, 1996; Woody, Chambless, & Glass, 1997; Lundh & Ost, 2001; Kley, Tuschen-Caffier, & Heinrichs, 2011).

Measurement of body dysmorphic symptomology.

Cosmetic Procedure Screening Questionnaire for Body Dysmorphic Disorder (Veale, Ellison, Werner, Dodhia, Serfaty, & Clarke, 2012).

The Cosmetic Procedure Screening Questionnaire (COPS; Veale et al., 2012; Appendix 16) was used to measure self-reported symptomology which may be indicative of BDD across all three groups. The COPS is a nine item questionnaire which was designed for use in cosmetic

surgery settings to screen for BDD. The questionnaire asks individual's to rate how frequently they check features, how much their features distress them, and to what extent their pre-occupation with their features impacts upon their everyday life (Veale et al., 2012). Each item is scored on a scale of 0 to 9, with three items which are reverse scored. Higher scores are indicative of lower body image and quality of life, with a score of 40 or above suggestive of potential BDD. The COPS was selected as it is a freely available and brief measure, which allowed the re-rating of BDD symptomology for participants in the BDD group who were recruited from clinical services (who had their symptoms assessed between one and six months prior to the study), and a rating of BDD symptomology for individual's recruited from a BDD support group. The COPS has acceptable internal consistency (Cronbach's alpha scores ranging from 0.41-0.86), convergent validity, and test-retest reliability (correlation = 0.87; Veale et al., 2012).

Measurement of depression.

The Patient Health Questionnaire-9 (Kroenke, Spitzer, & Williams, 2001).

The Patient Health Questionnaire-9 (PHQ-9; Kroenke et al., 2001; Appendix 17) was used to measure self-reported levels of depression. The PHQ-9 is a nine item questionnaire which asks people to rate how frequently they have experienced various factors which are symptomatic of depression over the past two weeks, with each item scored from 0 (not at all) to 3 (nearly every day), giving a maximum total score of 27. A score of 10-15 is seen to represent moderate (and therefore clinically relevant) depression, with scores of 15-19 and 20-27 representing moderately severe and severe depression respectively. The PHQ-9 has been reported as having high specificity, sensitivity, and internal consistency (with Cronbach's alphas ranging from .86-.89), as well as having excellent reliability (Kroenke et al., 2001) and validity (Löwe,

Kroenke, Herzog, Gräfe, Quenter, Zipfel et al., 2004). As a tool, it is a widely used measure of depressive symptomology, both in clinical and research settings.

Measurement of Anxiety.

The Generalised Anxiety Questionnaire 7 (Spitzer, Kroenke, Williams, & Lǒwe, 2006).

The Generalised Anxiety Questionnaire-7 (GAD-7; Spitzer et al., 2006; Appendix 18) was used to measure self-reported levels of anxiety. The GAD-7 is a seven item questionnaire which asks people to rate how frequently they have experienced various factors which are symptomatic of anxiety over the past two weeks, with each item scored from 0 (not at all) to 3 (nearly every day), giving a maximum total score of 21. A score of 6-10 is seen to represent moderate anxiety, with scores above these totals considered clinically relevant and indicative of moderately severe (11-15) and severe (16-21) anxiety. The GAD-7 has been reported as having excellent internal validity (Cronbach's alpha = .92), good test-retest reliability (correlation = 0.83), as well as high specificity (Cronbach's alpha .80; Spitzer et al., 2006). The GAD-7 is a widely used measure of anxious symptomology, both in clinical and research settings.

Piloting

Whilst the researcher, her supervisors, and various ethics committees had reviewed and approved the study testing protocol, the study was also discussed as a focus group with service users attending a London based group to explore their perception of the study. Service users were asked about the overall procedure, its length, clarity and acceptability. The service user group gave feedback where they explained that they were interested in the study, felt the procedure was reasonable and acceptable for potential participants, and that the measures selected were clear and understandable. The only amendment they suggested was to make

large print questionnaires available for service users who requested them, which was implemented.

Statistical Analysis

The data collected was quantitative in nature, and was analysed using the Statistical Package for Social Sciences (SPSS) version 21.0. ANOVA and ANCOVA were selected to investigate hypotheses which involved group differences, and pearson's correlations were selected to investigate relationships between variables. The specific analyses carried out and results of these are described in detail in the following chapter (Chapter 3).

Chapter 3: Results

This chapter begins by reporting the exploratory data analyses which were conducted prior to examining the main study hypotheses, before presenting the demographic characteristics for the entire sample, along with clinical characteristics of the BDD and anxiety groups. Following this, between groups analyses investigating levels of interoceptive awareness (IA) are then presented, in addition to analyses which measure the relationship of IA with self-objectification and focus of attention. The chapter concludes with an overview of the reported results.

Data Screening and Analysis Plan

The Statistical Package for Social Sciences (SPSS) version 21.0 was used for all analyses. A total of 60 participants (n = 14 BDD group, n = 23 Anxiety group, n = 23 non-clinical group) were included in the analyses of the proposed hypotheses. Sample sizes are shown across analyses, and occasionally n = less than the numbers mentioned above, due to participants not completing items.

Before any analyses were performed, data were inspected for normality and missing values as described below. Variables which were not normally distributed were transformed to produce a normal distribution, to reduce loss of power and enable the use of parametric statistics. Assumptions for parametric testing were met unless stated in the text or tables.

Where parametric assumptions were met for continuous data, ANOVA and variants were used for analyses. Assumptions of homogeneity of regression slopes for ANCOVA were tested by investigating the interaction between covariates and the independent variable. None of these interactions were significant, suggesting that ANCOVA could be used for analyses. In addition, multicollinearity of covariates was investigated using Pearson's correlations, and was not significant, meaning all covariates could be entered into analyses. Categorical data were

analysed using Chi-Square tests. For 2 x 2 tables or where any cells had values of less than 5, Fisher's Exact Test was used. Associations between variables were calculated using Pearson's Correlation. Results are reported to two decimal places, and a statistical significance level of .05 was selected for interpreting the results (Tabachnik and Fidell, 2007). Where multiple comparisons have been made, this level was adjusted to reduce the risk of a type I error. All tests reported are two-tailed.

Exploratory Data Analysis

All data and variables were screened to ensure accuracy of data entry, missing values, univariate outliers, and assumptions for use of parametric testing.

Missing data.

The overall clinical sample was comprised of 40 participants who consented to take part in the study (n = 16 BDD group, and n = 26 anxiety group). However, two participants in the BDD group did not complete the IA task (with both reporting that seeing their reflection would be too anxiety provoking), and could not be included in the analyses, reducing the BDD group to n = 14. In addition, three participants in the anxiety group did not complete the IA task as they were unable to engage with the task during the explanation and trial phase. Therefore the anxiety group included in analyses presented consists of n = 23.

Of the remaining clinical sample, two participants did not report their height, and one participant did not report their height or weight, with all three participants' part of the anxiety group. For this reason, later analyses which contain Body Mass Index (BMI) as a covariate are reported with a reduced sample size. No further missing data was identified in the clinical sample.

A non-clinical sample of n = 23 was recruited to match the final two clinical samples as closely as possible based on demographic characteristics. Non-clinical group data was explored for missing values. As with the clinical sample, two participants did not report their weight, and one participant did not report their height or weight, meaning a reduced sample size is reported for BMI as a covariate later in the chapter. No further missing data was identified within the non-clinical group. Further to this, descriptive statistics were used to initially check the entire dataset (clinical and non-clinical samples, n = 60) for any data entry errors (for example by investigating variable ranges).

Outliers and normality of distribution.

The use of scales producing interval data and independent individual participants to investigate the hypotheses meant that data met the minimum requirements for the use of parametric tests. Exploration of the distributions of each variable that entered analyses reported were carried out independently for each group.

Variables across each group satisfied the assumptions for normality based on inspections of histograms with normal curves, and scores for skewness and kurtosis which satisfied $z < 2.58$ (p<.01) as recommended by Tabachnik and Fidell (2007). The only exception to this was the scores of the anxiety group (n = 23) on the Generalised Anxiety Questionnaire 7 (Spitzer et al., 2006). This data had a pointed distribution, as indicated by a kurtosis value of $z = 3.01$. Inspection of a histogram with a normal curve (using a mean score and standard deviation as guidance figures) revealed one outlier within this variable. As the outlier was part of an already small clinical sample, the data was manually winsorised as recommended by Field (2005). Winsorising the data led to a kurtosis score of $z = -.576$, indicating that the variable was subsequently normally distributed.

A further two outliers were identified within the measure of IA in the blank screen condition (n = 1 BDD participant, n = 1 non-clinical participant). Again, as the data was part of a small sample, the two outliers were manually winsorised (Field, 2002).

Demographic Characteristics of Overall Sample

The overall sample consisted of 60 participants. There were 14 participants in the BDD group, 23 participants in the anxiety group, and 23 participants in the non-clinical control group. The mean age of the sample overall was 33 years (standard deviation (SD) = 10.32 years), with a range of 18-54 years. There were 33 males (55%) and 27 females (45%) in the total sample, the majority of whom were of White British (76.7%), were employed (63.3%) and were educated to degree level (40%) at the point of data collection. Chi-Square tests were conducted to examine any significant differences between the three groups on categorical demographic variables. Table 3.1 gives a full breakdown of all demographic characteristics across the groups.

Table 3.1

Demographic characteristics of the sample by group

	BDD (n= 14)	Mixed anxiety (n = 23)	Non-clinical controls (n = 23)
Age, years			
Mean(SD)	34.6 (8.86)	31.2 (11.48)	34 (10.1)
Minimum / maximum	18 / 45	18 / 54	18 / 53
Range	27	36	35
Gender, n (%)			
Male / Female	7 (50%) / 7 (50%)	12 (52.2%) / 11 (47.8%)	14 (60.1%) / 9 (39.1)
Ethnicity, n (%)			
White / White British	11 (78.6%)	16 (69.6%)	19 (82.6%)
Black / Black British	1 (7.1%)	1 (4.3%)	0 (0%)
Asian / Asian British	1 (7.1%)	2 (8.7%)	1 (4.3%)
Other Ethnicity	1 (7.1%)	4 (17.4%)	3 (13%)
Educational level, n			
GCSE or equivalent	4 (28.6%)	4 (17.4%)	4 (17.4%)
Diploma or equivalent	0 (0%)	4 (17.4%)	5 (21.7%)
A Level of Equivalent	4 (28.6%)	5 (21.7%)	6 (26.1%)
Degree	6 (42.9%)	10 (43.5%)	8 (34.8%)
Employment status, n (%)			
Student	1 (7.1%)	9 (39.1%)	5 (21.7%)
Unemployed	5 (35.7%)	2 (8.7%)	0 (0%)
Employed	8 (57.1%)	12 (52.2%)	18 (78.3%)

Gender

55% of participants were male. Comparing the three groups, the proportion of males and females were not significantly different across the three groups (χ^2 = 0.536; df = 2; p =.765; n= 60).

Ethnicity

With regards to reported ethnic background, overall 76.7% of participants were White British, 8.3% of participants were of another white origin, 6.7% of participants were Asian, and the remaining 8.3% of participants were of Black, Black British, or mixed ethnicity backgrounds. The ethnicity of the three groups was not significantly different (Fisher's Exact Test = 13.77; df = 12; p = .315; n=60).

Age

The mean age of the sample was 33 years (SD = 10.23, *range* 18-54). A oneway ANOVA showed no significant between group differences with regards to age in years ($F_{(2, 59)}$ = .612, p = .546).

Educational level

The largest majority of the sample was educated to degree level (40%). Across the three groups there were no significant differences with regards to highest level of qualification achieved (Fisher's Exact Test = 3.99; df = 6; p = .678; n=60).

Employment

Across the three groups the majority of individual's were employed (63.3%). Fisher's Exact Test showed a significant difference between the three groups (Fisher's Exact Test = 14.86; df = 4; p = .005; n=60). Based on the observed and expected cell frequency counts, it appears that these differences were in relation to a greater number of individual's with BDD who were unemployed compared to non-clinical controls, and a greater number of individual's with anxiety who were students, as displayed in Table 3.2 below.

Table 3.2

Observed and expected frequencies for employment status by diagnostic group

		Group diagnoses			
		BDD	Anxiety	Control	Total
Employment status					
Employed	Count	8	12	18	38
	Expected count	8.9	14.6	14.6	38
Unemployed	Count	5	2	0	7
	Expected count	1.6	2.7	2.7	7
Student	Count	1	9	5	15
	Expected count	3.5	5.8	5.8	15
Total	Count	14	23	23	60
	Expected count	14	23	23	60

Overview of demographic characteristics.

Whilst there was no significant between group differences in relation to the age, gender, ethnicity, and education level of the BDD, anxiety, and non-clinical groups, a significant difference did exist in terms of employment status. Whilst this difference did exist, the decision was taken not to enter employment status into further analyses conducted as a covariate. The reason for this decision is that there is no literature or theoretical rationale to suggest that employment status as a lone factor would have a direct relationship with levels of interoceptive awareness or self-objectification.

Characteristics of the clinical sample.

Further characteristics were recorded that will be reported for the clinical groups only. No participants in the control group reported any previous or current psychiatric difficulties or diagnoses. Table 3.3 gives a breakdown of the clinical characteristics of the BDD and anxiety groups.

Table 3.3

Diagnoses and current and past treatment status of clinical groups

	BDD (n= 14)	Anxiety (n = 23)
Diagnoses, n		
BDD	10	0
BDD & depression	2	0
BDD/ depression /anxiety	2	0
Anxiety & depression	0	5
Social anxiety	0	11
OCD	0	7
Age when diagnosed, n		
Same age now	3	6
One to five years younger	8	11
Five years + younger	3	6
Treatment status, n		
In treatment now	12	17
Treatment in last twelve months	2	6
Treatment setting, n		
Outpatient	12	22
Inpatient	2	1
Medication, n		
Yes / No	8 / 6	10 / 13

Overview of group characteristics.

In summary, no significant differences were found between the BDD group and anxiety group with respect to time since initial diagnosis (Fisher's Exact Test = .302; df = 2; p = .860; n=37), treatment status (χ^2 = .715; df =1; p =.398; n= 37) or treatment type (with 81.1% of participants naming CBT as the treatment they were receiving or had received; χ^2 = .315; df = 1; p =.575; n=37), or prescribed medication (χ^2 = .650; df = 1; p = .508; n=37). This suggested that any significant differences detected between the two groups in subsequent analyses would not be due to differences in these variables.

Main Analyses

Hypotheses 1 and 2.

Interoceptive awareness at blank screen and mirror conditions.

In order to assess whether or not there were any differences in IA in the blank screen condition (condition 1) and also in the mirror condition (condition 2), IA scores for both conditions were compared across the three groups. A group (BDD vs Anxiety vs non-clinical) by condition (blank screen vs mirror) mixed model ANCOVA (with covariates listed below) was run, with IA scores in blank screen and mirror conditions entered as dependent variables. IA scores can range from 0 to 1, with a higher score indicating high levels of IA.

As discussed in chapter 1, previous research has demonstrated that depression, BMI, and medication share a relationship with levels of IA. For this reason, participants' PHQ-9 scores, BMI (where available), and medication status (taking prescribed medication or not) were entered into the following analysis as covariates. In addition, past studies investigating levels of IA across groups of participants (e.g. Ainley et al., 2012) also controlled for the effect of average

heart rate across conditions, and order in which conditions were presented to participants (blank screen vs mirror condition first). Therefore, participants' average heart rate in both blank screen and mirror conditions and order of condition were also entered as covariates.

The mixed model ANCOVA showed no significant main effect of condition ($F_{(1, 51)}$ = 1.36, p = .249), indicating that clinical and non-clinical participants levels of IA did not differ between the blank screen and mirror conditions. There was a significant main effect of group ($F_{(2, 51)}$ = 8.36, p = .001), indicating that levels of IA across the three groups were significantly different. The interaction of condition and group was also significant ($F_{(2, 51)}$ = 3.44p = .040), indicating that levels of IA across the three groups differed within each of the IA conditions (blank screen and mirror). Figure 3.1 below demonstrates the significant main effect of group, and significant interaction of group and IA condition.
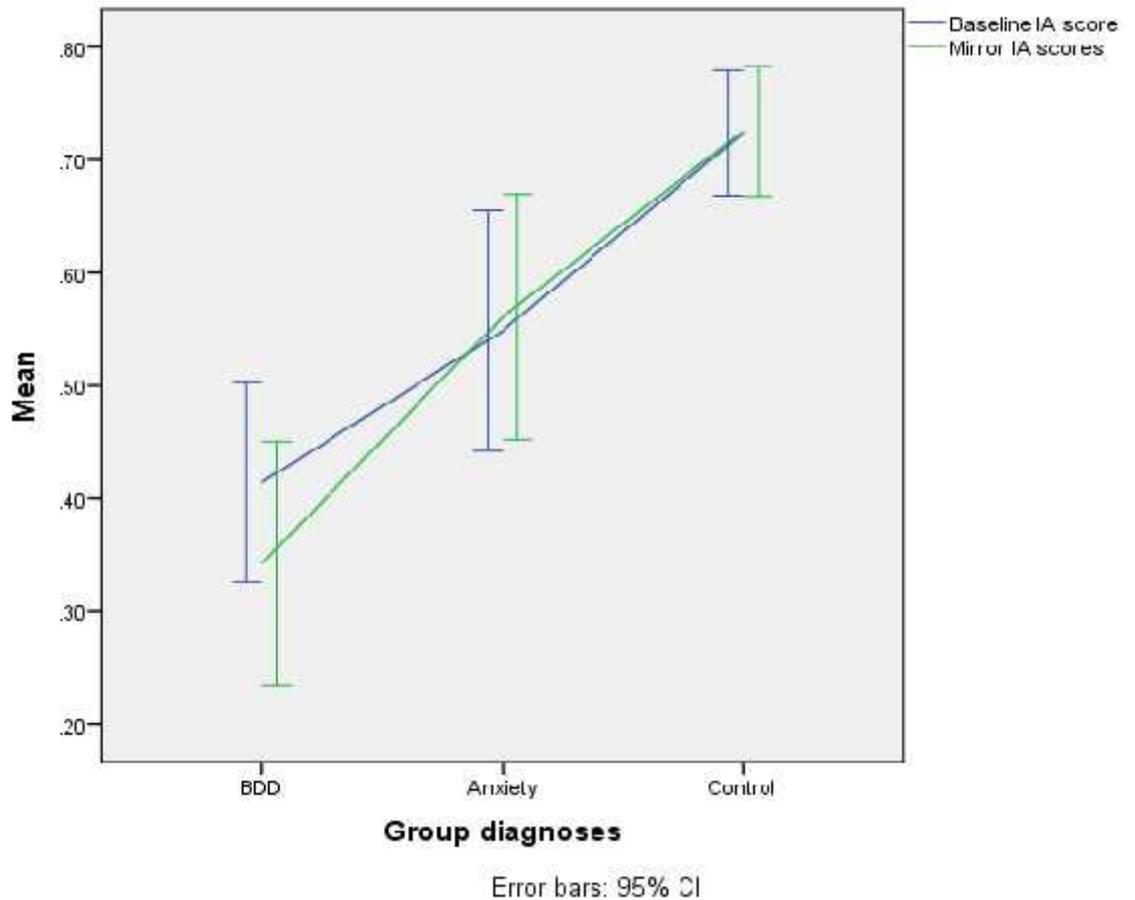
Figure 3.1

Mean IA scores in blank screen and mirror conditions by participant group

Whilst previous research has highlighted the relationship between IA and depression $(F(1, 51) = .040, p = .843)$, and IA and prescribed medication $(F(1, 51) = 1.88, p = .177)$, these factors shared no significant relationship with IA in the current study. As a further investigation of the potential impact of depression, analyses were run with depression entered as a covariate and not entered as a covariate, due to the difficulty of controlling for this factor in a clinical sample. There were no differences between the results of the analyses in either scenario. In

addition, for those participants for whom data was available, the analysis was also run with BMI entered as a covariate. BMI did not explain a significant amount of variance in IA ($F(1,44) = 2.32$, $p = .135$). The orders of conditions presented to participants (blank screen vs mirror condition first; ($F(1,51) = .903$, $p = .347$) and participant's average heart rate across each condition (blank screen - ($F(1,51) = .056$, $p = .814$); mirror − ($F(1,51) = .006$, $p = .940$) were also non-significant factors.

Due to the nature of BDD and participant's likely pre-occupation with mirrors, as well as entering order of conditions as a covariate, ANOVA's were also carried out to directly test the impact of order of IA conditions both across groups and within the BDD group. These analyses showed that there was no direct relationship between IA scores and order of IA conditions presented across groups in the blank screen ($F(1,59) = .551$, $p = .461$) and mirror IA ($F(1,59) = 1.29$, $p = .261$) conditions. Further to this, analyses demonstrated that there was no direct relationship between IA scores and order of IA conditions presented within the BDD group in the blank screen ($F(1,13) = .082$, $p = .780$) and mirror IA ($F(1,13) = .578$, $p = .462$) conditions. The results of these analyses justify counterbalancing the conditions.

Part of hypothesis two predicted that there would be a within group difference in levels of IA, with levels of IA increasing in the non-clinical and anxiety groups under the mirror condition, and levels of IA decreasing in the BDD group in this condition. The non-significant main effect of condition did not support this prediction across all groups. As there was a significant group by condition interaction, paired samples t-tests were carried out to investigate whether condition impacted significantly on the performance of any group independently. Bonferroni corrections were applied to the resulting p values from these t-tests, to reduce the risk of a type I error ($p = 0.05 / 3$ comparisons $= p$ 0.017). Results showed that for the BDD group only, there was a significant difference between mean scores across conditions ($t(13) = 2.81$, $p = .015$) with mean

scores of .41 in the blank screen condition and .34 mirror condition. This supported the prediction of hypothesis 2, that the BDD group would display lower levels of IA in the mirror condition compared to the blank screen condition. There were no significant differences for the anxiety (t(22) = -.483, p = .634) or non-clinical (t(22) = -.078, p = .938) groups across conditions.

Whilst Figure 3.1 highlights the difference between the three groups, it was necessary to carry out Fisher's protected independent t-tests to clarify which of these differences were significant and had contributed to the interaction between IA condition and group. Bonferroni corrections were applied to the resulting p values from these t-tests, to reduce the risk of a type I error (p = 0.05 / 6 comparisons = p   0.008). The results of these analyses are shown and discussed below in Tables 3.4 through to 3.9.

Table 3.4

Comparison of IA scores at blank screen condition between BDD (n=14) and anxiety (n =23) groups

	Mean (SD)	T	Df	Sig. (2 tailed)
BDD	.41 (.15)	-1.83	35	.076
Anxiety	.55 (.25)			

Table 3.5

Comparison of IA scores at mirror condition between BDD (n=14) and anxiety (n =23) groups

	Mean (SD)	T	Df	Sig. (2 tailed)
BDD	.34 (.19)	-2.80	35	.008
Anxiety	.56 (.25)			

Results of comparisons between the BDD and anxiety groups demonstrated no significant difference in mean levels of IA between the groups in the blank screen condition (p > .008). This is not in line with what was predicted, with hypothesis 1 suggesting that the BDD group would have lower levels of blank screen IA than the anxiety group. Whilst the mean IA value of the BDD group (.41) was lower than that of the anxiety group (.55), the difference was not large enough to reach significance.

In relation to the mirror condition, there was a significant difference between IA levels of the two groups (p = .008), with the mean IA score of the BDD group (.34) being significantly lower than that of the anxiety group (.56). This suggests that the BDD group displayed significantly lower levels of IA when asked to look at their reflection in the mirror whilst completing the IA task than the anxiety group. This result is in line with hypothesis 2, where it was predicted that IA levels of the BDD group would be worse than the anxiety group within the mirror condition of the task.

Table 3.6

Comparison of IA scores at blank screen condition between BDD (n=14) and non-clinical (n =23) groups

	Mean (SD)	T	Df	Sig. (2 tailed)
BDD	.41 (.15)	--6.63	35	.000
Non-clinical	.72 (.13)			

Table 3.7

Comparison of IA scores at mirror condition between BDD (n=14) and non-clinical (n =23) groups

	Mean (SD)	T	Df	Sig. (2 tailed)
BDD	.34 (.19)	-7.26	35	.000
Non-clinical	.73 (.13)			

Results of comparisons between the BDD and non-clinical groups demonstrated a significant difference in mean levels of IA in the BDD and non-clinical groups in the blank screen condition (p < .001). This supports hypothesis 1 which suggested that the BDD group (.41) would have lower levels of IA at blank screen than the non-clinical group (.72).

In relation to the mirror condition, there was also a significant difference between IA levels of the two groups (p< .001), with the mean IA value of the BDD (.34) group being significantly lower than that of the non-clinical group (.73). This suggests that the BDD group

displayed significantly lower levels of IA when asked to look at their reflection in the mirror whilst completing the task than the non-clinical group, as predicted in hypothesis 2.

Table 3.8

Comparison of IA scores at blank screen condition between anxiety (n=23) and non-clinical (n =23) groups

	Mean (SD)	T	Df	Sig. (2 tailed)
Anxiety	.55 (.25)	-3.02	33.1	.005
Non-clinical	.72 (.13)			

*Levene's test significant therefore p value selected based on equal variances not assumed

Table 3.9

Comparison of IA scores at mirror condition between anxiety (n=23) and non-clinical (n =23) groups

	Mean (SD)	T	Df	Sig. (2 tailed)
Anxiety	.56 (.19)	-2.77	33.5	.009
Non-clinical	.73 (.13)			

*Levene's test significant therefore p value selected based on equal variances not assumed.

Results of comparisons between the anxiety and non-clinical groups demonstrated a significant difference in mean levels of IA in the anxiety (.55) and non-clinical (.72) groups in the blank screen condition (p = .005), with the anxiety group demonstrating lower levels of IA. This is not in line with what was predicted, with hypothesis 1 suggesting that the anxiety group would have higher levels of IA than the non-clinical group on the basis of previous research.

In relation to the mirror condition, there was no significant difference between IA levels of the two groups (p = .009), with the mean IA value of the anxiety (.56) group not being significantly lower than that of the non-clinical group (.73). The mean difference between the two groups IA levels within the mirror condition was very similar to that of the blank screen condition, and marginally missed meeting significance based on Bonferroni corrected values. The mean values did not support the prediction made in hypothesis 2 that the anxiety group would display higher levels of IA than the non-clinical group in each condition.

Summary of IA Results

IA blank screen condition.

Hypothesis 1 predicted that mean levels of IA at blank screen would be lowest in the BDD group, followed by the non-clinical group, and highest in the anxiety group. This hypothesis was only partially supported. The BDD group did display significantly lower levels of IA at blank screen than the non-clinical group, but there was no significant difference between blank screen levels of IA in the BDD and anxiety groups. In addition, the anxiety group had significantly lower IA levels in the blank screen condition than the non-clinical group.

IA mirror condition.

Hypothesis 2 predicted that mean within group levels of IA in the mirror condition would decrease in the BDD group as compared to the mean blank screen condition score, with the anxiety and non-clinical groups mean IA scores increasing in the mirror condition. The mirror condition impacted on the IA performance of the BDD group negatively, with a significantly reduced mean IA score in this condition as compared to blank screen within this group, supporting hypothesis 2. However, there was no significant impact of condition on the anxiety or control group mean scores which remained relatively stable.

Analysis of the interaction effect showed that the BDD group mean IA score in the mirror condition was significantly lower than that of the anxiety and non-clinical group (with no significant difference between the anxiety and non-clinical group in this condition). This also supported the idea that the mirror condition of the IA task would have a different effect on IA levels of the BDD group in comparison to another clinical and non-clinical group.

The performance of the non-clinical group was different to what was expected based on past research, with the mirror condition not increasing levels of IA. In addition, the anxiety group did not perform as expected, with past research demonstrating high levels of IA at blank screen in groups diagnosed with anxiety as compared to non-clinical controls.

The current anxiety group consisted of individual's with a range of diagnoses. Whilst it would be interesting to investigate IA by individual anxiety diagnoses the small sample size did not permit this. Five participants with Anxiety also reported co-morbid depression, which has been demonstrated as being linked to lower levels of IA (Dunn, 2010). In addition, two participants in the anxiety group scored over 40 on the COPS (Veale et al., 2012), which may be indicative of symptoms of BDD.

For these reasons, correlations between IA and COPS score and IA and PHQ-9 scores were run for the anxiety group to investigate if a relationship existed between these variables. Whilst blank screen IA and mirror IA scores shared a negative correlation with levels of depression (PHQ-9 score) and body image concerns (COPS score), as can be seen below in Table 3.10 none of these correlations were statistically significant.

Table 3.10

Relationship between mean IA levels, depression, and body image concerns (anxiety group, n =23)

Experimental variables	IA blank screen	IA mirror	PHQ-9	COPS
IA blank screen	1.00			
IA mirror	.883**	1.00		
PHQ-9	-.171	-.032	1.00	
COPS	-.228	-.222	.799**	1.00

** = p<0.01 (two tailed)

Engagement with IA tasks.

One other possibility that may have influenced results of the IA task was how focussed participants were on attempting to connect with and count their heart beats in each condition, and also how much they were able to focus on their reflection ahead of them in the mirror IA condition. Participants were asked to rate these aspects on a likert scale from 1 (not paying attention) to 10 (paying complete attention) for each three aspects at the end of the relevant IA trials. A oneway ANOVA was carried out to assess whether any differences in subjective ratings of focus existed between groups. Mean ratings of task engagement and results of this analysis are shown below in Table 3.11. Results highlighted no significant group differences in relation to engagement with IA blank screen task ($F_{(2,59)} = 1.86$, $p > .05$), engagement with IA mirror task ($F_{(2,59)} = 1.26$, $p > .05$), and engagement with own reflection in the mirror ($F_{(2,31)} = .716$, $p > .05$).

Table 3.11

Subjective ratings of attention during IA tasks across groups

	Mean IA blank screen task engagement rating	Mean IA mirror task engagement rating	Mean reflection engagement rating
BDD group (n=14)	8.36	6.86	7.14
Anxiety group (n=23)	8.17	7.30	7.74
Non-clinical group (n=23)	*8.43*	7.83	7.56
Significance (p value)	*.830*	.290	.716*

*Welch statistic quoted due to significance of Levene's Test of homogeneity of variances

Hypothesis 3 – Self-Objectification and IA

Possible range of self-objectification scores were from -25 to 25, with a high score indicating a high level of self-objectification. Hypothesis 3 predicted that the BDD group would display higher self-objectification scores than the anxiety and non-clinical groups. In order to assess whether any between group differences existed in relation to self-objectification scores a oneway ANOVA was conducted, with SOQ scores entered as the dependant variable. Results showed

that there was a significant between group difference on this variable ($F_{(2, 59)}$ = 5.06, p = .010), as displayed in Figure 3.2.
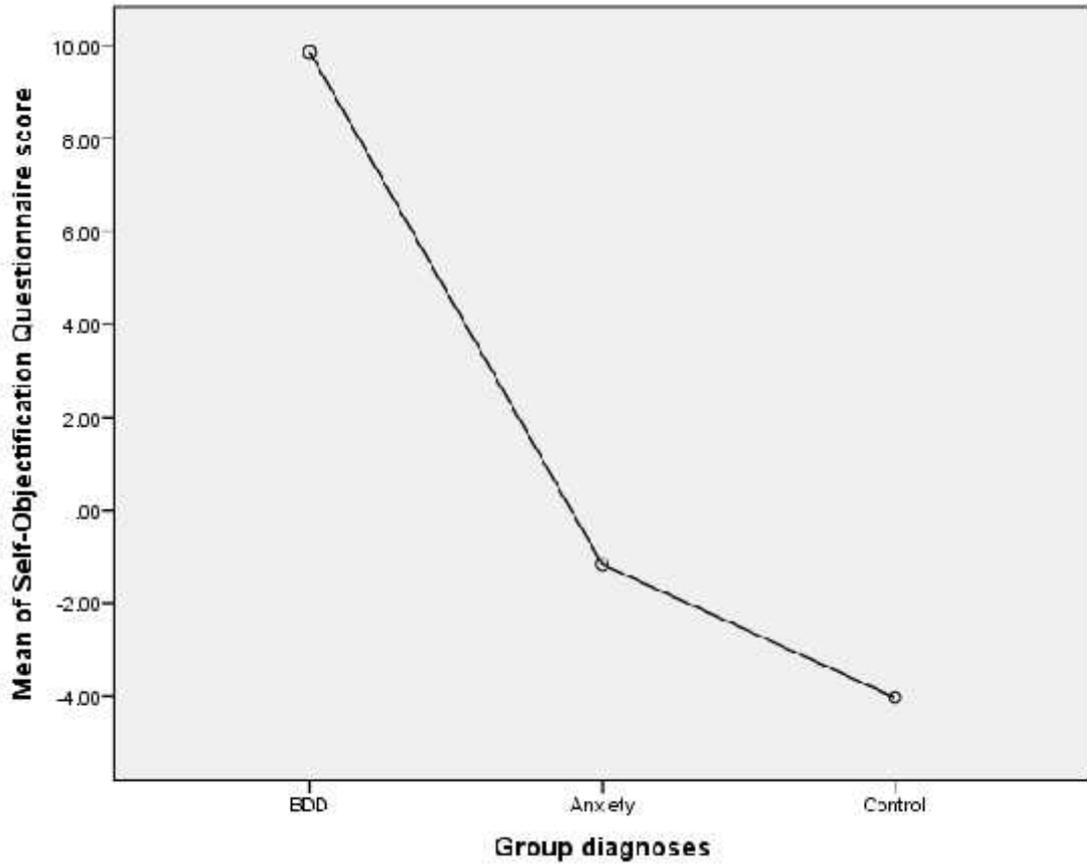
Figure 3.2. – Mean Self-objectification questionnaire scores by group diagnoses

In order to establish which of these group differences were significant, Fisher's protected independent t-tests were run comparing each group to the other two. Bonferroni corrections were applied to the resulting p values from these t-tests, to reduce the risk of a type I error (p = 0.05 / 3 comparisons = p   0.017). The results of these analyses are shown below in Tables 3.12 through to 3.14.

Table 3.12

Comparison of mean Self-Objectification Questionnaire scores between BDD (n=14) and anxiety (n =23) groups

	Mean (SD)	T	Df	Sig. (2 tailed)
BDD	9.86 (13.8)	2.46	35	.019
Anxiety	-1.17 (12.8)			

Results showed no significant difference between the BDD and anxiety group with respect to scores on the SOQ (p = .019). The BDD group had a higher mean score than the anxiety group, which was close to reaching Bonferroni corrected significance, suggesting a trend towards participants with BDD having higher scores on the SOQ.

Table 3.13

Comparison of mean Self-Objectification Questionnaire scores between BDD (n=14) and non-clinical (n =23) groups

	Mean (SD)	T	Df	Sig. (2 tailed)
BDD	9.86 (13.8)	3.05	35	.004
Non-clinical	-4.04 (13.2)			

A t-test comparing the BDD and non-clinical groups showed a significant difference between the BDD and non-clinical group SOQ scores (p = 0.004), with the BDD group having a significantly higher mean SOQ score than the non-clinical group, indicating higher self-reported levels of self-objectification.

Table 3.14

Comparison of mean Self-Objectification Questionnaire scores between anxiety (n=23) and non-clinical (n =23) groups

	Mean (SD)	T	Df	Sig. (2 tailed)
Anxiety	-1.17 (12.8)	.748	44	.459
Non-clinical	-4.04 (13.2)			

Results of the comparison between the anxiety and non-clinical groups on the SOQ showed no significant difference, suggesting that levels of self-objectification were similar across the two groups (p = .459).

Summary of Self-Objectification Scores across Groups

The hypothesis that the BDD group would have the highest scores on the SOQ and therefore display high levels of self-objectification in comparison to another clinical and non-clinical group was partially supported. The BDD group displayed significantly higher levels of self-objectification in comparison to the non-clinical group, and there was a trend towards levels of self-objectification being higher in the BDD group than the anxiety group (p = 0.019). However, this trend was non-significant once Bonferroni corrections were applied.

Hypothesis 3 and 4

Interoceptive awareness, Self-objectification, and Focus of Attention

As the focus on the self and the body was being investigated, it was also felt important to measure levels of self-focussed attention. Scores for self-focussed attention can range from 1 to 5, with higher scores on the scale indicating higher levels of self focused attention.

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To investigate the relationship between IA, self-objectification, and focus of attention, partial correlations were carried out for each of the three participant groups individually. Results of these analyses are displayed below in Tables 3.15 through to 3.17.

Table 3.15

Relationship between mean IA levels, self-objectification, and focus of attention in the BDD group (n =14)

Experimental variables	IA blank screen	IA mirror	SOQ	SFA
IA blank screen	1.00			
IA mirror	.860**	1.00		
SOQ	.083	-.060	1.00	
SFA	.260	.158	-.192	1.00

** = p<0.01 (two tailed)

Results showed that self-objectification score did not share a significant relationship with either IA condition in the BDD group, with very small correlations in each case. Hypothesis 3 suggested that SOQ scores and IA would share an inverse relationship in this group, but this was only true of the IA mirror condition. In addition, there was also no significant relationship between self-focussed attention and levels of IA in either condition. Whilst the correlations were slightly larger and both positive, suggesting that as self-focussed attention increased levels of IA also improved, neither reached significance.

Table 3.16

Relationship between mean IA levels, self-objectification, and focus of attention in the Anxiety group (n=23)

Experimental variables	IA blank screen	IA mirror	SOQ	SFA
IA blank screen	1.00			
IA mirror	.883**	1.00		
SOQ	-.145	.006	1.00	
SFA	-.226	-.201	.275	1.00

** = p<0.01 (two tailed)

Correlations showed that self-objectification score did not share a significant relationship with either IA condition in the anxiety group, again with small correlations in each case. In addition, there was also no significant relationship between self-focussed attention and levels of IA in either condition. The correlations for self-focussed attention were negative in both conditions, suggesting that as self-focussed attention increased levels of IA decreased in the anxiety group, as opposed to the positive relationship observed between SFA and IA in the BDD group.

Table 3.17

Relationship between mean IA levels, self-objectification, and focus of attention in the non-clinical group (n =23)

Experimental variables	IA blank screen	IA mirror	SOQ	SFA
IA blank screen	1.00			
IA mirror	.663**	1.00		
SOQ	.159	-.121	1.00	
SFA	-.243	-.175	-.036	1.00

** = $p < 0.01$ (two tailed)

Results showed that self-objectification score did not share a significant relationship with either IA condition in the non-clinical group, with small correlations in each case. In addition, there was also no significant relationship between self-focussed attention and levels of IA in either condition. The correlations for self-focussed attention were negative in both conditions, suggesting that as self-focussed attention increased levels of IA decreased in the non-clinical group, as was seen with the anxiety group.

Summary of IA, Self-Objectification, and Self-Focus of Attention Results

Overall, across all three groups no significant relationship was observed between levels of IA and levels of self-objectification or self-focussed attention. This does not support the predictions which were made as part of hypothesis 3 or 4. The suggestion that self-objectification would share a significant inverse relationship with IA in the BDD group was not confirmed. In addition,

there was no significant relationship between increased self-focussed attention and levels of IA in any of the groups.

Brief Summary of Results

Hypothesis 1 predicted that mean levels of IA at blank screen would be lowest in the BDD group, followed by the non-clinical group, and highest in the anxiety group. This hypothesis was only partially supported. The BDD group showed significantly lower levels of IA at blank screen than the non-clinical group, but were not significantly different to the anxiety group at blank screen. The anxiety group displayed significantly lower levels of blank screen IA than the non-clinical group, which was unexpected on the basis of previous research.

In addition to this, hypothesis 2 was partially supported. The mirror condition of the IA task did significantly impact upon the performance of the BDD group, with lower levels of IA demonstrated in this condition when compared to blank screen. However, improved levels of IA were not observed in the mirror condition for either the non-clinical or anxiety groups, with the hypotheses that the BDD group would have significantly lower levels of IA in this condition compared to blank screen, and the anxiety and non-clinical groups would show improvements in IA in this condition.

Analysis showed a significant interaction effect, which highlighted that the BDD groups mean IA score in the mirror condition was significantly lower than that of both the anxiety and non-clinical group, further supporting the notion of the BDD group's performance being negatively impacted by the introduction of the mirror in comparison to the other two groups.

Hypothesis 3, which predicted that the BDD group would display higher self-objectification scores than the anxiety and non-clinical groups, was also partially supported. The BDD group had significantly higher levels of self-objectification in comparison to the non-clinical

group, with a non-significant trend towards levels of self-objectification being higher in the BDD group than the anxiety group ($p = 0.019$, Bonferroni corrected). However, this trend was non-significant once Bonferroni corrections were applied.

Hypothesis 3 also predicted that there would be a significant inverse relationship between self-objectification and IA in the BDD group. This hypothesis was not supported, with no significant relationship observed between levels of IA and levels of self-objectification across any of the participant groups. An inverse relationship was observed in the BDD group between SOQ scores and the IA mirror condition, but this failed to reach significance.

Hypothesis 4 predicted that there would be an inverse relationship between levels of IA and levels of self-focussed attention in the BDD group. This hypothesis was not supported, with the BDD group displaying a positive and non-significant relationship between levels of IA and scores on the FAQ.

These results and their implications for future research will be further discussed in the next chapter.

Chapter 4: Discussion

This chapter presents a summary of the study, and discusses the results of the study in relation to the hypotheses outlined in Chapter 1. Strengths and limitations of the study are acknowledged, before clinical implications and possible areas of future research are considered.

Study Aims

The aim of the current study was to investigate levels of interoceptive awareness in BDD, to explore whether interoceptive awareness (IA) could be heightened through increased self-focussed attention via use of a mirror, and to investigate whether interoceptive awareness shared a relationship with levels of self-objectification and self-focussed attention within this population. Therefore, the current study recruited adults with a diagnosis of BDD as well as two comparison groups of adults diagnosed with anxiety and adults with no reported diagnoses. Participants completed questionnaires measuring their levels of self-objectification, as well as questionnaires measuring their self-focus of attention, and levels of depression and anxiety. In addition, they completed a heartbeat detection task which allowed measurement of levels of IA. Participants took part in both a blank screen condition and mirror condition (where they were asked to observe their own reflection), to investigate whether IA levels varied across groups and across the two conditions.

Summary and Interpretation of the Main Results

Results will now be summarised and discussed for each of the four hypotheses outlined in chapter one.

The role of interoceptive awareness in BDD.

On completion of the blank screen condition (condition 1) of the heartbeat detection task the BDD group will display lower levels of IA than the anxiety group and the non-clinical group. The anxiety group will display the highest levels of IA.

Analyses showed a significant main effect of group with regards to IA scores. When this difference was investigated, the BDD group was found to have the lowest mean score for IA across the three groups within the blank screen condition, suggesting that the BDD group did have lower levels of IA than the anxiety and non-clinical groups, and were less able to connect with their internal bodily signals.

The difference between the BDD and non-clinical groups IA blank screen scores reached significance, suggesting that the mean IA score of the BDD group was substantially lower than that of the non-clinical group. There was no significant difference between blank screen IA levels in the BDD and anxiety groups (both before and after Bonferroni corrections were applied). This suggests that although the BDD group did have a lower mean IA score in the blank screen condition, this score was not substantially lower than the score of the anxiety group. In addition to this, further analyses highlighted that the mean IA scores of the anxiety group were significantly lower than those of the non-clinical group, which was not expected.

Overall therefore, hypothesis 1 was only partly supported. The BDD group did display significantly lower levels of IA at blank screen, but only in comparison to the non-clinical group. This did not support hypothesis 1 which predicted that the BDD group would find it more difficult to connect with their internal bodily signals than both the non-clinical and anxiety group.

The desired sample size for each group was 25 participants as outlined in chapter 2. However, due to difficulties with recruitment and the exclusion of a number of participants who

could not engage with the IA task, this sample size was not achieved. This may have meant that other effects existed, but the study was underpowered to detect them. Therefore these results should be interpreted with caution and need replication within a larger sample.

This study was the first to demonstrate low levels of IA in BDD compared to non-clinical participants, and mirrors previous research by various authors with participants diagnosed with anorexia nervosa, which highlighted reduced levels of IA in anorexia nervosa on the basis of questionnaire measures (Fassino et al., 2004; Lilenfield et al.,2006; Matsumoto et al. ,2006), as well as the heartbeat detection IA blank screen task (Pollatos et al., 2008) used in the current study. This would suggest that for both anorexia nervosa and BDD, where it has been demonstrated that reduced bodily satisfaction and distorted external body perception exists, there is a differential relationship with the internal body when compared to non-clinical participants.

In addition, Tsakiris et al. (2011) showed that non-clinical individual's with low levels of IA were more susceptible to misperceiving their external body, as demonstrated by their increased susceptibility to the Rubber Hand Illusion. If further research replicated the results of the current study and confirmed low levels of IA within a larger population of individual's diagnosed with BDD, low levels of IA could be seen as one variable which may contribute to the misperception of the body observed in BDD, with individual's perceiving major deficits which either are minimal or do not exist.

These results add weight to the argument presented by Kaplan et al. (2013) that there should be further studies which aim to explore somatoperception in BDD. It is suggested that better understanding of the relationship between the internal and external body and it's representation in BDD may provide new information about the characteristics and features of BDD. As discussed in Chapter 1, there is a dearth of research into BDD generally and in

particular into its biological and neurological underpinnings. By investigating differences in somatoperception, theory and understanding of BDD can be broadened.

Hypothesis 1 also predicted that the anxiety group would have higher IA scores at blank screen than both other groups, as a result of finding it easier to identify their own internal bodily signals. This prediction was not supported. This was unexpected as past research (see Domschke et al. 2010 for a review) has reported that on the whole increased levels of IA are seen in participants diagnosed with a range of anxiety disorders, such as panic disorder, social phobia, and generalised anxiety disorder (Domschke et al., 2010; Ehlers et al., 1992; Ehlers et al., 2000; Pineles et al., 2005; Van der Does et al., 2000; Zoellner et al., 1999). The current study used a heartbeat detection task to measure levels of IA, which has been shown to be a reliable and valid indicator of levels of IA (Ainley et al., 2011). Domschke et al. (2010) have discussed the reliance of many studies into IA in anxiety disorders upon self-report measures of IA. The fact that a heartbeat detection task was selected to measure IA in the current study may partly contribute to the different results observed in in comparison to past studies.

Previous research into anxiety and IA has demonstrated links to heightened levels of IA across a range of anxiety disorders, hence the inclusion of a mixed anxiety group in the current study. However, with hindsight it may be possible that the inclusion of participants with OCD (n=7) in the anxiety group may have contributed to the difference between the current results and previous research. As reported in Chapter 1, BDD and OCD share some overlap with regards to presentation and pathology. Whilst it was deemed that there was enough difference between the two clinical groups in the current study which focussed on self-objectification and body dissatisfaction, it may be that individual's with OCD do not demonstrate superior levels of IA as seen in other anxiety disorders. In the time between the conception of the study to its completion, OCD was moved from the Anxiety Disorders category in DSM-IV (APA, 2002), and

relocated under a specific category for Obsessive Compulsive Disorders in DSM-V (APA, 2013). It may be that as was suggested regarding BDD in the current study, OCD is qualitatively different to many other anxiety disorders in its presentation, which may have contributed to lower levels of IA than expected in the anxiety group. Interestingly, three participants diagnosed with OCD agreed to participate, but then could not engage with the task as reported in Chapter 3. These participants reported being unable to connect with their heart beat whatsoever during the trial phase of the task, suggesting a very low level of connection with their internal body. Anecdotally, this may add credence to the notion of IA being low in OCD, but in the context of the current study this idea is speculative and should be considered in this light.

In addition, some participants had co-morbid diagnoses of depression (which has been linked to reduced levels of IA; Dunn et al., 2007) and it may be that this also contributed to the low levels of IA demonstrated by the anxiety group in comparison to past research. It would have been interesting to split the anxiety group into diagnostic categories to see if there were differing relationships with IA but an already small sample size and multiple analyses did not permit this further investigation. Further to this, score on the PHQ-9, which indicates levels of depressive symptomology, was not significant as a covariate when entered into analyses of IA.

The current study also did not identify a significant relationship between blank screen levels of IA and depressive symptomology as has been demonstrated in previous studies (e.g. Dunn et al., 2010). However, whilst some participants in the current study did experience co-morbid depression alongside BDD or anxiety, this was not their primary diagnosis. In addition, as mentioned previously, certain participants were also taking prescribed medication for their symptoms, which has been shown to influence the link between levels of depression and IA (Dunn et al., 2007).

The Impact of Observing One's Reflection on Interoceptive Awareness.

On completion of the mirror condition (condition 2) of the heartbeat detection task the BDD group will display the lower levels of IA than the anxiety group and the non-clinical group. In addition, in comparison to the blank screen IA condition, levels of IA in the BDD group will decrease, while levels of IA across the anxiety and non-clinical groups will increase.

Analyses showed no significant main effect of condition, indicating that the ability of all three groups to connect with their internal bodily signals, and therefore their mean IA scores, did not vary across the two conditions. Due to the significant interaction between group and condition, paired samples t-tests were used to investigate the impact of condition within groups. Analyses showed that the mean score of the BDD group significantly reduced in the mirror condition when compared to the blank screen condition. This supported hypothesis 2 where it was predicted that the mean IA scores of the BDD group would decrease in this condition as compared to the blank screen condition. However, there was no significant impact of condition on levels of IA for the anxiety and non-clinical groups. Both groups mean IA scores increased in the mirror condition, but this increase was minute (.01 mean score increase in both cases). This was not in line with hypothesis 2, where it was predicted that the mean IA scores of the anxiety and non-clinical groups would increase in the mirror condition as compared to the blank screen condition.

Due to the significant interaction which was identified between condition and group, analyses were also carried out to investigate between group differences across conditions. Comparisons highlighted that significant differences existed in mean levels of IA between the BDD group and the non-clinical group, and the BDD group and the anxiety group within the mirror condition of the heartbeat detection task. In both cases, the BDD group mean IA score was significantly lower than the other groups. This suggests that when participants with BDD were asked to look at their reflection in a mirror whilst completing the heartbeat detection task,

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their IA levels and ability to connect to their internal bodily sensations were significantly lower than participants diagnosed with anxiety or no clinical diagnoses.

This is interesting, as it indicates the negative impact the introduction of a mirror may have had on the BDD groups' task performance in comparison to the anxiety group. In previous analyses the two groups IA levels were not significantly different at blank screen, but in the mirror condition the difference between the two groups became significant, and this difference appeared to be driven by a reduction in IA scores in the BDD group during the mirror condition.

On comparison of the anxiety and non-clinical group, no significant difference was observed with regards to mean IA scores in the mirror condition, which would point to the idea that both groups were equally able to connect with their internal bodily signals in this condition. However, the mean IA score of the anxiety group was lower than that of the non-clinical group in this condition, and would have been significant on the basis of non-Bonferroni corrected p values, only marginally missing the corrected p value for significance (Bonferroni corrected p .008, actual p value = .009). This suggests that there was a trend towards the anxiety group performing significantly more poorly than the non-clinical group in the mirror IA condition, just as was seen in the blank screen condition.

In summary, hypothesis 2 was partly supported. The predictions for the BDD group were confirmed, with the group displaying significantly lower levels of IA in the mirror condition of the heartbeat detection task as compared to the blank screen condition, and also significantly lower levels of IA in the mirror IA condition in comparison to the other two groups. However, the mean IA scores of the anxiety and non-clinical groups did not increase in the mirror IA condition when compared to the blank screen IA condition, which did not support what was predicted. Again, due to the small group sample sizes these results need to be interpreted with tentatively, and would benefit from replication.

When considering the IA mirror condition, the BDD group were significantly less able to connect with their bodily signals in this condition when compared to blank screen. They were also less able to connect to their bodily signals than both the non-clinical and anxiety groups in the mirror condition. This suggests that observing their own reflection led to differences in connecting with internal bodily signals in comparison to both other groups. This result was in line with previous research by Kaplan et al., (2012) who identified differences between individual's with BDD and those without this diagnosis when taking part in the Rubber Hand Illusion task. When compared to non-clinical participants (n =15), participants with BDD (n=16) were significantly more likely to report the rubber hand as feeling like their own, regardless of whether the rubber hand was stroked synchronously with their own hand (the condition thought to induce the illusion) or asynchronously. Kaplan et al. (2012) suggested that the results of the above study indicate that for participants with BDD looking at the body affects the way that it is processed. Another factor that may have contributed to the increased malleability of external body perception in Kaplan's (2012) sample may have been lower levels of IA, which has been demonstrated as being linked to increased susceptibility to misperceiving the external body (Tsakiris et al., 2011).

It is possible that the effects of frequent mirror gazing which is reported as a common part of the disorder (Phillips et al., 1993) means that the group share a different relationship when viewing their body compared to other groups, which then impacts on how the body is processed as suggested by Kaplan et al. (2012).

Further to this, chapter 1 highlights a number of studies which have demonstrated different processing of visual stimuli both in relation to individual's own bodies as well as other objects. Such differential visual processing may also share a relationship with reduced levels of IA in the mirror condition, where attention may be directed solely to external aspects of the self,

in comparison to attention being directed more to the complete self over and above physical qualities in individual's without a diagnosis of BDD.

The current study asked participants to rate their focus during the heartbeat detection task both on their heart rate and their reflection, as this may have contributed to differing IA scores. There were no significant group differences, which suggested that differences in IA across groups could not solely be attributed to differences in focus during the task. However, this was a very basic measure and a subjective rating of focus, with responses which may have been biased by social desirability.

In addition to this, the results of the current study are also not in line with previous work of Ainley et al. (2012), who demonstrated that the use of a mirror improves levels of IA during a heartbeat detection task in non-clinical participants. In the current study, for the BDD group, mean levels of IA reduced significantly in the mirror condition as predicted in hypothesis 2. However, there was no significant impact of heartbeat detection task condition on either the anxiety or non-clinical groups mean IA scores. For the anxiety and non-clinical groups, mean levels of IA increased in the mirror condition, but this increase was marginal compared to the blank screen condition. It is possible that this difference in results may be due to different analysis strategies. Ainley et al. (2012) employed a median split for their group (n =105) data on the heartbeat detection task, and the impact of introducing a mirror was only seen for participants rated as having low levels of IA. Median split analyses for the groups in the current study to compare participants with low and high levels were not used due to small group sizes. In addition, the non-clinical group in the current study had a relatively high mean blank screen IA score (.72), so may not have contained such a range of participants with relatively low levels of blank screen IA. However, Ainley et al.'s (2013) sample consisted solely of female

undergraduates. This specific sample somewhat limits the study, and further research is needed within more generalizable non-clinical samples to confirm this link.

Whilst levels of IA were negatively impacted by the introduction of a mirror in the BDD group, it is interesting to consider other possibilities for attempting to modify IA, or the ability of participants with BDD to increase their connection with their internal body. If a different method was employed to increase levels of IA, and was shown to be successful in doing so, it could have implications for changing the way individual's with BDD relate to not only their internal but also their external body, with previous research demonstrating a relationship between these bodily connections.

Do Individual's with BDD Evaluate Themselves as Aesthetic Objects?

The BDD group will display higher self-objectification scores than the anxiety and non-clinical groups. Further to this, across the groups, there will be an inverse relationship between levels of self-objectification and levels of IA.

Between group comparisons of scores on the Self-Objectification Questionnaire (SOQ) showed that there was a significant difference across the three groups. To establish the nature and direction of these differences Bonferroni corrected analyses were run. The mean BDD group score on the SOQ was significantly higher than the mean score of the non-clinical group on this measure, both before and after the application of Bonferroni corrections. This would suggest that as a group, participants with BDD reported placing greater importance on their physical characteristics which can be judged by others than participants in the non-clinical group.

The mean SOQ score of the BDD group was higher than that of the anxiety group and would have been significant on the basis of non-Bonferroni corrected p values. However, once Bonferroni corrected values were applied, the result became non-significant (Bonferroni

corrected p   .017, actual p value = .019). This suggests that there was a trend towards BDD group participants scoring more highly than anxiety group participants on the SOQ, and it is possible that with a larger sample size and greater power this effect would reach significance, with greater power enabling the detection of significant differences between clinical samples.

The second part of hypothesis 3 proposed that there would be an inverse relationship between levels of self-objectification and IA scores in both conditions of the heartbeat detection task, particularly for the BDD group. Across all three groups, there was no significant relationship between scores on the SOQ and mean IA scores in either blank screen or mirror conditions. Inverse relationships were observed between these variables in the blank screen IA condition for the anxiety group, and the mirror IA condition for the BDD and non-clinical groups, but the correlations observed were extremely small. It should be noted that this was a tentative and exploratory hypothesis. In the context of the current study these hypotheses could not be tested fully given the level of recruitment and the resulting lack of power for correlational analyses.

Hypothesis 3 was only partially supported. The BDD group had a significantly higher mean score on the SOQ and displayed higher levels of self-objectification than the non-clinical group. There was also a trend towards the BDD group having higher levels of self-objectification than the anxiety group, but this between group difference was no longer significant after Bonferroni corrections had been applied. The prediction that there would be an inverse relationship between levels of self-objectification and levels of IA was not supported. As stated previously, these results need to be interpreted in the context of a small sample size.

The current study had predicted that one factor that may share a relationship with low levels of IA in BDD would be heightened levels of self-objectification. This was hypothesised in the context of previous work by Ainley et al. (2013) who demonstrated heightened levels of self-

objectification being linked to lower levels of IA, but also as high levels of self-objectification may also be another common characteristic of BDD and eating disorders, where low levels of IA have previously been demonstrated. Calogero et al. (2005) demonstrated a link between eating disorders and high levels of self-objectification, and Veale's cognitive model of BDD (2004) alludes to heightened levels of self-objectification in BDD. The results of Ainley et al. (2013) and Calogero et al. (2005) suggested that greater importance being placed the physical features of the external body was linked to a disconnection with the internal body. Further to this, Eshkevari et al. (2012) reported a link between increased susceptibility to the Rubber Hand Illusion in participants diagnosed with eating disorders sharing a relationship with lower levels of IA and higher levels of self-objectification. This demonstrated that heightened self-objectification and low levels of IA were linked to increased susceptibility to misperceive the external body. In the current study however, no significant relationship was found between levels of self-objectification and levels of IA in BDD, or in fact in any of the three groups, which was not in line with what was predicted. However, due to the small sample size it is possible that such effects were not able to be detected.

The results of hypothesis 3 did not support previous research by Ainley et al. (2013) which demonstrated a relationship between reduced levels of IA and heightened levels of self-objectification in non-clinical participants. The sample sizes of the three groups in the current study were smaller than hoped, which may have meant that medium or small effects were undetected. In addition, Ainley et al.'s (2013) sample was drawn from a specific population (female undergraduates) limiting the generalizability of their results.

Results of hypothesis 3 supported the notion of heightened levels of self-objectification existing in BDD, as proposed by Veale's (2004) cognitive model of BDD, which places importance on the processing of the self as an aesthetic object. The BDD group had

significantly higher levels of self-objectification than the non-clinical group as measured by the SOQ in the current study. There was also a trend towards the BDD group having higher levels of self-objectification than the anxiety group, which was only became marginally non-significant following Bonferroni corrected group comparisons. It is hypothesised that with a larger sample this trend may become significant, adding strength to the notion that this model accurately captures a key cognitive aspect which is central to BDD.

Previous work by Noll and Fredrikson (1998) identified the possible role of self-objectification in maintaining distress within a non-clinical population, by demonstrating that self-objectification shared a direct relationship with eating disorder symptomology, and that body shame also partially mediated the relationship between these two factors. There is a possibility that heightened levels of self-objectification may also play a similar role in BDD, which future research could attempt to explore.

Does heightened self-focussed attention in BDD detract from attention focussed on the internal body?

There will be an inverse relationship between levels of self-focussed attention and levels of IA within the BDD group.

The relationship of self-focussed attention (scores on the Focus of Attention Questionnaire) and mean scores in both IA conditions was investigated. In the BDD group, small positive correlations existed between scores of self-focussed attention and scores in both IA conditions, whereas for the anxiety and non-clinical groups, small negative correlations existed in relation to these variables. However, none of these correlations were significant. Therefore, hypothesis 4 was not supported. Again, this result should be reflected upon in the context of the study, where

hypothesis 4 was tentative and exploratory, and could not be tested fully given the level of recruitment and the resulting lack of power for correlational analyses.

Ainley et al. (2012) have suggested that increasing self-focussed attention may elevate levels of IA within non-clinical individual's with low levels of IA. It was predicted that this would not be the case in BDD, and that in fact heightened levels of self-focussed attention would correlate with lower levels of IA. The cognitive model (Veale, 2004) proposes that for many individuals with BDD, heightened selective attention which is directed to the self tends to be directed to the physical features of the external body which contributes to maintenance of distress, and also restricts attention being directed to other areas. Therefore, it was predicted that self-focussed attention in BDD would share a relationship with less attentional capacity to focus on the internal body, and ultimately lower levels of IA. However, no significant relationship was identified between IA and levels of self-focussed attention across any group.

The questionnaire which measured self-focussed attention was brief, and it is possible that this measure was unable to fully capture differences in self-focussed attention, despite being used within other populations. Further to this, work which has linked increased self-focussed attention to heightened levels of IA has not measured this construct directly, but instead has only discussed it as a mechanism which may contribute to higher levels of IA. Again, as previously discussed, these results should be interpreted tentatively due to the small sample size of the groups recruited. It may be that effects were not detected due to a lack of power.

Study Strengths and Limitations

    Strengths.

A strength of the current study is that it has contributed novel information to the field of BDD in two areas. It is both the first study to measure levels of self-objectification in participants with BDD directly, and also the first study to measure levels of IA in participants diagnosed with BDD. Past publications by Kaplan et al. (2013) and Neziroglu et al. (2008) have called for more research into BDD and specifically for research which investigates aspects of proposed psychological models of BDD and the role of somatoperception in BDD. The current study added some support to the notion of heightened levels of self-objectification in individual's with BDD, and reduced levels of IA being worthy of further exploration.

    The current study has extended research which has looked at IA and levels of self-objectification and manipulation of IA, which was previously investigated by Ainley et al. (2012) and (2013) within groups of solely undergraduate females to a different non-clinical sample, and two clinical samples. The current study did not replicate the results of Ainley et al. (2012) and (2013) with possible explanations for this discussed previously.

    The BDD group was compared to a non-clinical group, but also to a different clinical group which provided useful information. Most previous studies investigating IA within a clinical sample reported in Chapter 1 have lacked an alternative clinical sample. The groups used in the current study were also well matched with regards to demographic and clinical characteristics, meaning that it is unlikely that the differences reported are due to such factors.

    Limitations.

This study recruited clinical participants from two psychology services based in London, and two support groups also based within London. Non-clinical participants were recruited through an

undergraduate university sample at Royal Holloway University, and opportunistic sampling within London. The limited geographical location from which participants were drawn and the fact that the vast majority of participants were Caucasian may limit the generalizability of results to other populations. In addition, clinical participants were being seen for treatment in most cases, and there is a possibility that treatment could be a confounding variable.

However, both clinical groups were well matched with regards to time since diagnosis and treatment status, suggesting that valid comparisons could be made. In addition, previous work investigating IA and BDD as separate constructs has often drawn from relatively specific samples, and it is hoped that the results will apply to a broader population if replicated, as has been the case with other studies.

Within the London based outpatient service, 16 individual's with BDD and 19 individuals with anxiety decided not to participate in the study. At the London based inpatient service, 2 individual's with BDD and 6 individuals with anxiety decided not to participate in the study. A further 15 individual's with BDD and 40-50 individual's with anxiety who attended London based support groups for their respective difficulties received information on the study, but did not participate. In addition, some staff at the London based outpatient service reported that there were certain clients who they did not discuss the study with due to the nature of their difficulties (around 4-5 clients within the service).

It is important to consider the impact such factors may have had on the results of the current study, particularly when considering how generalizable results may be. Given the distressing nature of BDD, it may be that the people who agreed to participate were qualitatively different to those people who declined to take part or did not contact the researcher. For example, if the most distressed people declined participation, this may have reduced the power of the study.

Furthermore, some individual's diagnosed with BDD who attended the support group where recruitment took place spoke to the researcher and stated that they would have taken part should the research not involve observing their reflection in the mirror. Two participants also agreed to participate but then felt unable to complete the task due to the mirror component on the day that participation was scheduled. It is crucial to consider how representative the current group of participants with BDD were in the IA task. Previous research has indicated that many participants with BDD engage in frequent mirror checking (Philips et al., 1998; Veale & Riley, 2001), but this potential bias should be acknowledged.

Due to difficulties with recruitment of the BDD group the sample size was less than originally planned and it may be that type II errors arose in analyses. Hence if small or medium effects existed they may not have been detected. Despite this, the sample size was sufficient to identify several significant effects and also trends, giving insight into the most relevant variables of difference between participants with BDD and those without this diagnosis.

With regards to monitoring participants engagement with the IA task and focus on their reflection in the mirror during the task, a one item question was used, with participants being asked to rate their focus on the task on likert scales. This one item measure was a self-reported and subjective rating, where participants may have been influenced by social desirability. Whilst this rating system was not ideal, it felt important to ask participants for some feedback on their engagement with the task, in case there were participants who reported not focussing on the task at all which would have influenced their results. An alternative option to track visual focus would have been to use an eye-tracking device. However, this presented two issues for the current study. Firstly, it was felt that this would add a qualitative difference by introducing an element of 'being watched' by another person, which may have influenced participants'

engagement and focus. Secondly, this equipment was not readily available, and would have been outside of the financial constraints of the study.

Also, the mirror element of the IA task has been proposed to improve levels of IA by increasing self-focussed attention (Ainley et al., 2012). The current study did not check whether this hypothesised mechanism worked and in fact did improve self-focussed attention as compared to the blank screen condition. Past studies using this manipulation have not measured this. It may have been possible to attempt to see if an increase in self-focussed attention did occur in the mirror condition, for example by asking participants to rate their self-focussed attention on a questionnaire following each condition. However, the validity of such a check is unknown, and completing the same questionnaire in quick succession may not lead to particularly meaningful results.

The results section included multiple analyses focussing on demographics, clinical characteristics, and the main research hypotheses. Whilst this was necessary, it increased the likelihood of Type I errors occurring. Fishers protected t-tests and Bonferroni corrections were applied where appropriate to guard against this likelihood as far as possible. However, some authors have criticised the use of Bonferroni corrections in this context (Perneger, 1998) hence reporting of analyses with and without corrections. It is acknowledged that the use of bonferroni corrections may have led to type II errors occurring during analyses. However, given the exploratory nature of the study and the small sample size it was felt that results should be seen in context of the number of analyses carried out, and therefore bonferroni corrected results are reported for completeness. Further to this, significance values and the conclusions drawn were reported in light of bonferroni corrections that had been used, and the possibility that trends may have become significant without the use of bonferroni corrections was discussed where relevant.

Whilst the heart beat detection task has been demonstrated to be a valid and reliable indicator of levels of IA in previous studies, the use of this measure and a mirror (as opposed to a questionnaire that measures levels of IA) dissuaded particular participants with BDD from taking part in the study, meaning that results are not wholly generalizable. In addition, whilst many participants were being seen for treatment at the time of the study and had been given a primary diagnosis by a clinician of BDD, OCD, or social anxiety, other participants were recruited from support groups and information was not available to confirm their reported diagnoses.

Ideally, with hindsight symptoms would have been re-rated at the time of the study using a clinical tool such as the Structured Clinical Interview for DSM (First et al., 2002; in Phillips et al., 2005). This was not drafted into the study protocol as the initial plan was to recruit only from the London based psychology clinic. However, when recruitment proved difficult ethical application was sought to extend recruitment to support groups. Therefore the study was limited in that six participants in the anxiety group (n = 23) and two participants in the BDD group (n =14) self-reported that they had received a clinical diagnosis of their respective conditions from a mental health professional. This means that the clinical characteristics of the groups cannot be guaranteed as the researcher was not able to confirm official diagnoses with the aforementioned participants.

The questionnaire measures which were selected were self-report measures. Plous (1993) has previously reported that self-report measures can lead towards responses which are thought to be more socially acceptable, and therefore bias responses.

In addition, recent research has suggested that IA may be a trait which is context dependant and can change in relation to the emotions an individual is feeling (Durlik, Brown, & Tsakiris, 2014). Given the nature of the two clinical groups' disorders, individuals may have felt

anxious meeting the researcher. Also, the ecological validity of the experimental context is not particularly high. Both of these aspects therefore could have influenced reported levels of IA, but unfortunately cannot be entirely controlled.

The study was quasi-experimental with non-random group assignment and differential in that it compared three groups of participants. However, causality can never be inferred from such a design. In addition, the study was cross-sectional. Participants were seen for around one hour on one occasion only. Previous research had suggested that IA was more of a trait than state variable (Anthony, Meadows, Brown, & Barlow, 1994) but the more recent work of Durlik et al. (2014) suggested that IA may be state dependant. Therefore it might be that the measures taken are not wholly representative of participants' levels of IA in general. It may be interesting to track levels of IA across the same participants on a number of occasions to achieve a longer term average. However, up to this point, this has not been a standard research method within the IA literature, and was also not practical for the current study given the time frames involved and the difficulty recruiting participants diagnosed with BDD.

Implications for Clinical Practice

The results of this study add support to the idea that processing of the internal body may be qualitatively different in people diagnosed with BDD when compared to those who do not have this disorder. This is the first study to identify that individual's with BDD have lower levels of IA than individual's with no known disorder. Broadening our understanding of the nature of interoceptive awareness in BDD may help in practice, where with a greater amount of research it may be possible to consider the use of alternative treatment strategies in BDD. Ainley et al.'s (2012) study suggests that levels of IA can be modified in non-clinical participants by increasing self-focussed attention. Whilst the current study did not replicate these results, Ainley et al.'s

(2012) work suggest that levels of IA are potentially modifiable, and alludes to the possibility of the relationship with the internal body being modified through training.

There is research to suggest that CBT is an effective intervention which helps to reduce BDD symptomology (Phillips & Rogers, 2011), but as discussed in Chapter 1 many individual's with BDD who seek treatment do not improve significantly (Phillips et al., 2006). If people with BDD find it difficult to connect to their internal body, this may have implications for how they manage their emotions and interpret social information and cues, with the relationship between these variables discussed in Chapter 1. It may be interesting then to consider ways in which the connection with the internal body and its processes could be heightened. The use of techniques like mindfulness could be considered by clinicians, where attention is frequently drawn back to the internal body and its rhythms. Interestingly, on debriefing participants as part of the current study, three individual participants diagnosed with BDD spontaneously commented on how effective they had found mindfulness to be to help them manage their levels of distress on occasions where they had been particularly upset about their appearance.

The results of the current study would also suggest that mirror use may have the capacity to increase disconnection with the internal body in BDD. The fact that gazing into a mirror negatively impacted levels of IA in the current sample of individual's with BDD supports the suggestion that the minimisation of mirror use in BDD should be a central part of CBT for the disorder as suggested by Veale (2004).

From a clinical perspective, the current study highlights the importance of the profile and impact of BDD as a disorder being raised. As recruitment of clinical groups proved difficult in the current study, participants were sought from support groups which held regular meetings. For BDD, across England there are only two documented support groups which provide a regular and dedicated space for people experiencing BDD. This is despite the very high estimated

prevalence rates reported in Chapter 1, and the existence of hundreds of support groups for other types of anxiety (such as OCD for example). This limited level of support is surprising and concerning, particularly when considering how many individual's may exist within the population who are experiencing BDD and have not sought help, or who are experiencing BDD at a subclinical level.

Awareness of the condition may be a key factor contributing to this lack of support. During the course of the current study it was intriguing to note that the vast majority of non-clinical participants and many participants diagnosed with anxiety had never heard of BDD, and were not aware of what the condition involved. More surprisingly, during discussions the researcher had around the project and what it was aiming to investigate, some mental health professionals were also unaware of the condition, or had heard of BDD but were unsure of the symptoms of the disorder. This may indicate that participants who present in clinics experiencing BDD may be misunderstood, or misdiagnosed, demonstrating the importance of further research to raise awareness and understanding of this debilitating condition.

Further to this, from a clinical research view, the study raises questions around how best to reach individual's experiencing BDD. It was extremely difficult to recruit participants with BDD into the current study, with many people declining to take part or explaining that they would like to but did not feel well enough to. This in part could be due to the fact that a mirror was used as part of the IA task, and some people may have found the idea of focussing on their reflection to be too distressing.

Alternatively, this may be indicative of a wider difficulty in recruiting from this population. Veale et al. (2013) have hypothesised that individual's with BDD fear that they may be rejected or face ridicule from others on the basis of their perceived physical deficits. BDD is unlike many other anxiety disorders in this respect, with the primary deficit or concern being a physical

characteristic which may be permanently visible or on show, particularly if it is a facial feature. Holding such beliefs may not only make it difficult to engage with treatment (Veale et al., 2013) but also to participate in research studies, particularly if the researcher is an unknown person to the individual.

Much of the literature published on BDD that has recruited from clinical populations involves relatively small samples, which seems to align with the argument that difficulties may be faced when attempting to recruit from this population. Again, another important research practice point is the need to consider how representative our knowledge base is of the wider population of individual's experiencing BDD. If only a certain proportion of individual's with BDD engage with research, the literature and understanding we have of the disorder may not capture the full range of experience and characteristics related to BDD.

From a clinical practice perspective, it is important to consider how individual's living with BDD may experience services in the current context of the National Health Service (NHS). Recently, there has been a trend towards the use of short term therapy models by clinicians, as services face increasing pressure to see a greater number of service users and to do so more quickly. Improving Access to Psychological Therapies (IAPT) models have been shown to work well in reaching many individual's with difficulties such as depression and anxiety (Clark, 2011). However, models like IAPT rely on the service user engaging quickly, and if this does not occur and individuals do not attend initial sessions then discharge follows soon after. This approach to treatment may mean individual's with BDD who may struggle to attend sessions and engage due to fear of rejection end up dropping out of the treatment system and continuing to struggle without support or understanding.

Further Research

The introduction to this thesis highlighted that there is a lack of research into BDD, despite the fact that it is a prevalent and distressing condition. This is particularly true when considering the investigation of somatoperception in BDD. Only one other study to date, carried out by Kaplan et al., in 2012, has investigated somatoperception in BDD, and both Kaplan et al.'s (2012) study and the current study found differences between the way individual's with BDD process their body when compared to non-clinical controls.

Whilst the current study was the first to document significantly reduced levels of IA in BDD and is helpful in its own right, it would be useful to replicate the results of the current study using a much larger sample of individuals diagnosed with BDD.

Previous research has demonstrated that individual's with lower levels of IA have more malleable representation of their bodies and are more susceptible to illusions such as the Rubber Hand Task (Tsakiris et al., 2011). Future research could aim to investigate these two concepts in the same sample of individuals diagnosed with BDD, to confirm whether this pattern also exists within this population. This would lend support to the idea that lower levels of IA are linked to the misperception of the body and its features, with both reported as being observed in BDD.

Future research could also build on the current study by recruiting a larger sample of participants with BDD to measure levels of self-objectification, and attempt to replicate the finding of significantly heightened levels of self-objectification in BDD in comparison to individuals with no reported diagnoses. A larger sample may also confirm the trend towards participants with BDD having higher levels of self-objectification than individual's diagnosed with other anxiety disorders. Clinically, it will also be important to further understand the nature of

self-objectification in BDD. It would be interesting to consider how self-objectification relates to body dysmorphic symptomology, and whether this relationship is mediated by body shame as has been reported in studies investigating disordered eating in non-clinical samples.

In addition to this, it would also be useful for future research to empirically measure other aspects of Veale's (2004) cognitive model of BDD, and other proposed models of BDD, which to date have received very little attention.

With the recent change in the way IA has been viewed, with some authors now suggesting that the concept represents a 'state' rather than 'trait' variable, there are new opportunities for research in this context. It would be interesting if longitudinal studies were carried out in the future, which measured levels of IA repeatedly in individual's with BDD over various time points in treatment, to see if levels of IA varied as symptoms or distress levels varied.

Finally, when considering the difficulties faced in recruitment of individual's diagnosed with BDD in the current study, future research may wish to consider recruitment alongside cosmetic surgery clinics that could screen for BDD during consultations. This would need to be carefully managed, with established links to treatment settings for individuals who wished to seek further information or treatment. However, given the extent to which BDD may be under-diagnosed within the general population when considering prevalence rates, this group of individual's may be able to receive psychological treatment for their difficulties should they choose to, as well as providing useful information for research, which would enable a better understanding of the disorder.

Conclusion

While there has been no previous research into levels of IA in BDD prior to this study, participants with BDD demonstrated significantly lower levels of IA than participants with no clinical diagnosis. Beginning to understand how the body is processed in BDD may provide valuable information with regards to the nature of the disorder and its maintenance.

Results demonstrated that individual's diagnosed with BDD did not respond in a similar way to a clinical and non-clinical group to the use of a mirror, which has previously been reported to enhance levels of IA in non-clinical participants with low levels of IA by increasing self-focussed attention (Ainley et al., 2012). The BDD group had a significantly lower mean IA score than both the non-clinical and anxiety groups in the mirror condition of the heart beat detection task. For people with BDD their reflection in a mirror may have a myriad of meanings, with many individual's spending hours gazing at their perceived defects in mirrors and then ruminating (Veale, 2004).

It may be that other methods to increase self-focussed attention to the internal body could be explored, to investigate their utility in increasing attention directed to the internal body and modifying the relationship between the internal and external body, with the aim of reducing the focus on solely aesthetic features. The utility of alternative therapeutic techniques such as mindfulness, which can be used to draw attention to the internal body, is an area which is yet to be explored within this population. Furthermore, Farb, Segal, and Anderson (2012) presented evidence which they propose demonstrated that mindfulness training can alter cortical recruitment of brain areas such as the anterior dysgranular insula regions, which are involved in the relationship between interoceptive and exteroceptive awareness.

Further to this, heightened levels of self-objectification were identified in the BDD group as compared to non-clinical controls, and there was a trend towards heightened levels of self-objectification in the BDD group when compared to the anxiety group. This supported the notion of the self being processed as an aesthetic object in Veale's (2004) cognitive model of BDD, which had previously not been empirically measured.

Whilst this study was had various limitations which mean the results reported need to be interpreted tentatively, given the adverse impact and outcomes associated with a diagnosis of BDD, more research into understanding the condition would be extremely useful, and it is hoped that the current study makes a small but important contribution to the field in this respect. As well as enhancing our understanding, further research into BDD would also begin to raise awareness of the condition among clinicians and the general population, which this study would suggest is urgently needed to improve wellbeing and access to effective treatment within this population.

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Appendices

Appendix 1: Clinical participant information sheet

INFORMATION SHEET

Body Dysmorphic Disorder and processing of bodily sensations

You are receiving this information sheet as an invitation to participate in the research study described above. Before you decide whether to take part or not, it is important that you understand why the research is being done and what it would involve. Please read the following information sheet carefully and discuss further with the lead researcher if you have any questions (contact details at the bottom of this sheet).

What is the aim of the research?

The aim of the current research study is to understand more about the way that people with a diagnosis of Body Dysmorphic Disorder (BDD) process and experience their bodily sensations. This will help in the way that psychological treatments are developed. The research is supervised by Dr Blake Stobie, who works as a Clinical Psychologist at the Centre for Anxiety Disorders and Trauma, NHS; by Dr. Abigail Wroe who works as a Clinical Psychologist and a Lecturer (clinical tutor) at RHUL; and by Dr. Manos Tsakiris, who is a Reader in Neuropsychology at RHUL.

What will I need to do if I take part in the research?

We are asking willing participants to spend around an hour with our research team on one occasion. Participants will be asked to complete five questionnaires (which should take around twenty to twenty five minutes to complete. We will also ask participants to complete a simple self-monitoring task whilst looking ahead at a blank screen and then looking ahead at their own reflection in a small mirror. This part of the research should take no longer than 15 minutes. As well asking people with a diagnosis of BDD to participate, we would also like to invite people with a diagnosis of an anxiety disorder, or no known diagnosis to participate in the study. If you choose to take part, on the day of your participation you can request to be sent an outline of the study results once the study has been completed. These results should be available in June 2014. After you have taken part, the researcher you meet will also give you a more detailed outline of the purpose of the study.

What happens to the results?

Any information collected during the course of the study will be kept strictly confidential, and no individual participant will be identifiable in any published reports which may arise from the

results. It is entirely up to you to decide whether or not you would like to take part in this study. If you do decide to take part, you are still free to withdraw your participation at any stage of the study without giving any reason. In the unlikely event that something goes wrong and you are harmed when taking part in the study, the usual NHS channels for making a complaint are available to you.

If you think that you may be interested in taking part in this study please telephone **Michelle Pratt** on **01784 414012.** She is the lead researcher and will be glad to answer any questions you may have or discuss the study further with you. If Michelle is not available when you telephone please leave a message stating your name and contact number, and she will call you back as soon as possible.

Thank you for taking the time to read this information sheet.

Appendix 2: Participant consent form

Centre Number:

Study Number:

Patient Identification Number for this trial:

CONSENT FORM

Title of Project: Interoceptive awareness in Body Dysmorphic Disorder

Name of Researcher: Michelle Pratt

Please initial all boxes

1. I confirm that I have read and understand the information sheet dated June 2013 (version number 2) for the above study. I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily.

2. I understand that my participation is voluntary and that I am free to withdraw at any time without giving any reason, without my medical care or legal rights being affected.

3. I understand that data collected during the study may be looked at by individuals from Royal Holloway University and South London and Maudsley NHS Trust, where it is relevant to my taking part in this research. I give permission for these individuals to have access to my records.

4. I agree to take part in the above study.

Name of Participant	Date	Signature

Name of Researcher	Date	Signature

Appendix 3: Clinical participant debrief information

Body Dysmorphic Disorder and processing of bodily sensations

Thank you for your time and for taking part in this study today. The aim of the current study is to understand more about the way that people with a diagnosis of Body Dysmorphic Disorder (BDD) process and experience their bodily sensations.

The ability to recognise and monitor bodily sensations has been reported to vary between different people. For example, it has been reported that people with a diagnosis of anxiety may be more aware of their bodily signals (such as their heart rate) when compared to people without a diagnosis of anxiety (Ehlers et al., 2000). Conversely, people with a diagnosis of an eating disorder may find it more difficult to identify their bodily signals (Pollatos et al., 2008). People with a diagnosis BDD experience anxiety around their physical appearance. Previously, their ability to monitor their bodily sensations has not been investigated.

If people find it difficult to identify their bodily signals it may mean that they pay more attention to their external qualities, such as the way they look, than their internal qualities (such as humour or kindness).

If this research highlights that people with a diagnosis of BDD find it difficult to identify their internal signals, it may partly explain why such an emphasis is placed on their physical appearance, which can cause people with this diagnosis to experience distress. The heart beat estimating task which you completed has been shown to be a good indicator of how aware people are of their bodily sensations.

If reduced bodily sensation awareness was identified in participants with a diagnosis of BDD, different factors may explain this. This study explored whether what people pay attention to, what they believe that other people think about them, and what they think of their own body is linked to how easily they can identify their own bodily signals. This information was collected using the questionnaires that you completed.

For people who find it difficult to estimate their heart rate (an internal bodily sensation), it has been found that using a mirror to observe their reflection improves their ability to do this (Ainley et al., 2012). This has never been tested in people who have a diagnosis of BDD, which was why we asked you to estimate your heart rate when looking at a blank screen and in a mirror.

If you feel that you have been affected by any aspect of the study, you can contact any of the research team to discuss how this affected you, and they can help you think about possible routes for support that may be helpful. Their contact details are listed at the end of this information sheet.

If you would prefer not to talk to the research team, you may wish to contact the BDD support group which is run by the Priory Hospital in North London, or discuss your feelings with your GP or local Improving Access to Psychological Therapies Service. The researcher will give you a separate sheet with all of these contacts. You can also contact Michelle Pratt at michelle.pratt.2011@live.rhul.ac.uk if you have any further questions regarding the study.

Research team contact details

Michelle Pratt – Trainee Clinical Psychologist at RHUL

Michelle.pratt.2011@live.rhul.ac.uk / 01784 414012

Dr Abigail Wroe – Clinical Psychologist and Clinical Tutor at RHUL

abigail.wroe@rhul.ac.uk / 01784 276 532

Dr Blake Stobie – Consultant Clinical Psychologist at the Centre for Anxiety Disorders and Trauma (Institute of Psychiatry)

blake.stobie@kcl.ac.uk / 020 322 82101

Organisations to contact for further information or support

If you feel that the current study has raised any issues for you personally and you would like further support, there are a number of people you could choose to contact for further information or support.

If you feel you would like to talk through how you are feeling, you are welcome to contact a member of the research team. Abigail Wroe and Blake Stobie, who are Clinical Psychologists and part of the research team, will be happy to discuss any issues you may feel concerned about. Their contact details are provided below;

Dr Abigail Wroe – Clinical Psychologist and Clinical Tutor at RHUL

abigail.wroe@rhul.ac.uk / 01784 276 532

Dr Blake Stobie – Consultant Clinical Psychologist at the Centre for Anxiety Disorders and Trauma (Institute of Psychiatry)

blake.stobie@kcl.ac.uk / 020 322 82101

If you would prefer to talk with someone outside of the research team, you could consider the following options;

1. You are welcome to contact the BDD support group which is run by the Priory Hospital in North London if you would like further information or support or have any concerns that have arisen since taking part in the study. Information on the group and meeting dates and times can be requested by emailing **northlondon@priorygroup.com** or telephoning **020 8882 8191**.

2. Your **general practitioner** (GP) will be able to advise and support you with any concerns you may have and may be able to refer you to a service that can offer you further advice or counselling.

Appendix 4: Non-clinical non student participant information sheet

INFORMATION SHEET

Body Dysmorphic Disorder and processing of bodily sensations

You are receiving this information sheet as an invitation to participate in the research study described above. Before you decide whether to take part or not, it is important that you understand why the research is being done and what it would involve. Please read the following information sheet carefully and discuss further with the lead researcher if you have any questions (contact details at the bottom of this sheet).

What is the aim of the research?

The aim of the current research study is to understand more about the way that people with a diagnosis of Body Dysmorphic Disorder (BDD) process and experience their bodily sensations. This will help in the way that psychological treatments are developed. The research is supervised by Dr Blake Stobie, who works as a Clinical Psychologist at the Centre for Anxiety Disorders and Trauma, NHS; by Dr. Abigail Wroe who works as a Clinical Psychologist and a Lecturer (clinical tutor) at RHUL; and by Dr. Manos Tsakiris, who is a Reader in Neuropsychology at RHUL.

What will I need to do if I take part in the research?

We are asking willing participants to spend around an hour with our research team on one occasion. Participants will be asked to complete five questionnaires (which should take around twenty to twenty five minutes to complete. We will also ask participants to complete a simple self-monitoring task whilst looking ahead at a blank screen and then looking ahead at their own reflection in a small mirror. This part of the research should take no longer than 15 minutes. As well asking people with a diagnosis of BDD to participate, we would also like to invite people with a diagnosis of an anxiety disorder, or no known diagnosis to participate in the study. If you choose to take part, on the day of your participation you can request to be sent an outline of the study results once the study has been completed. These results should be available in June 2014. After you have taken part, the researcher you meet will also give you a more detailed outline of the purpose of the study.

What happens to the results?

Any information collected during the course of the study will be kept strictly confidential, and no individual participant will be identifiable in any published reports which may arise from the

results. It is entirely up to you to decide whether or not you would like to take part in this study. If you do decide to take part, you are still free to withdraw your participation at any stage of the study without giving any reason. In the unlikely event that something goes wrong and you are harmed when taking part in the study, the usual NHS channels for making a complaint are available to you.

If you think that you may be interested in taking part in this study please telephone **Michelle Pratt** on **01784 414012.** She is the lead researcher and will be glad to answer any questions you may have or discuss the study further with you. If Michelle is not available when you telephone please leave a message stating your name and contact number, and she will call you back as soon as possible.

Thank you for taking the time to read this information sheet.

Appendix 5: Non-clinical student participant information sheet

INFORMATION SHEET

Body Dysmorphic Disorder and processing of bodily sensations

You are receiving this information sheet as an invitation to participate in the research study described above as you are collecting credits as part of your psychology degree. Before you decide whether to take part or not, it is important that you understand why the research is being done and what it would involve. Please read the following information sheet carefully and discuss further with the lead researcher if you have any questions (contact details at the bottom of this sheet).

What is the aim of the research?

The aim of the current research study is to understand more about the way that people with a diagnosis of Body Dysmorphic Disorder (BDD) process and experience their bodily sensations. This will help in the way that psychological treatments are developed. The research is supervised by Dr Blake Stobie, who works as a Clinical Psychologist at the Centre for Anxiety Disorders and Trauma, NHS; by Dr. Abigail Wroe who works as a Clinical Psychologist and a Lecturer (clinical tutor) at RHUL; and by Dr. Manos Tsakiris, who is a Reader in Neuropsychology at RHUL.

What will I need to do if I take part in the research?

We are asking willing participants to spend around an hour with our research team on one occasion. Participants will be asked to complete five questionnaires (which should take around twenty to twenty five minutes to complete). We will also ask participants to complete a simple self-monitoring task whilst looking ahead at a blank screen and then looking ahead at their own reflection in a small mirror. This part of the research should take no longer than 15 minutes.

As well asking people with a diagnosis of BDD to participate, we would also like to invite people with a diagnosis of an anxiety disorder, or no known diagnosis to participate in the study. On the basis of the questionnaire measures that participants are asked to complete, there may be various factors which mean that the study is not suitable for some people to continue with. Should this be the case for you, the researcher will have a discussion with you about this and further professional support would be available should you choose to access it.

If you choose to take part, on the day of your participation you can request to be sent an outline of the study results once the study has been completed. These results should be available in June 2014. After you have taken part, the researcher you meet will also give you a more detailed outline of the purpose of the study.

What happens to the results?

Any information collected during the course of the study will be kept strictly confidential, and no individual participant will be identifiable in any published reports which may arise from the results.

It is entirely up to you to decide whether or not you would like to take part in this study. If you do decide to take part, you are still free to withdraw your participation at any stage of the study without giving any reason. Deciding to participate in this study or not will have no influence on the outcome of your psychology course. If you do decide to take part you will be given 2 credits for your participation. In the unlikely event that something goes wrong and you are harmed when taking part in the study, the usual NHS channels for making a complaint are available to you.

If you think that you may be interested in taking part in this study please telephone **Michelle Pratt** on **01784 414012.** She is the lead researcher and will be glad to answer any questions you may have or discuss the study further with you. . If Michelle is not available when you telephone please leave a message stating your name and contact number, and she will call you back as soon as possible.

Thank you for taking the time to read this information sheet.

Appendix 6: Non-student participant debrief information

Body Dysmorphic Disorder and processing of bodily sensations

Thank you for your time and for taking part in this study today. The aim of the current study is to understand more about the way that people with a diagnosis of Body Dysmorphic Disorder (BDD) process and experience their bodily sensations.

The ability to recognise and monitor bodily sensations has been reported to vary between different people. For example, it has been reported that people with a diagnosis of anxiety may be more aware of their bodily signals (such as their heart rate) when compared to people without a diagnosis of anxiety (Ehlers et al., 2000). Conversely, people with a diagnosis of an eating disorder may find it more difficult to identify their bodily signals (Pollatos et al., 2008). People with a diagnosis BDD experience anxiety around their physical appearance. Previously, their ability to monitor their bodily sensations has not been investigated.

If people find it difficult to identify their bodily signals it may mean that they pay more attention to their external qualities, such as the way they look, than their internal qualities (such as humour or kindness).

If this research highlights that people with a diagnosis of BDD find it difficult to identify their internal signals, it may partly explain why such an emphasis is placed on their physical appearance, which can cause people with this diagnosis to experience distress. The heart beat estimating task which you completed has been shown to be a good indicator of how aware people are of their bodily sensations.

If reduced bodily sensation awareness was identified in participants with a diagnosis of BDD, different factors may explain this. This study explored whether what people pay attention to, what they believe that other people think about them, and what they think of their own body is linked to how easily they can identify their own bodily signals. This information was collected using the questionnaires that you completed.

For people who find it difficult to estimate their heart rate (an internal bodily sensation), it has been found that using a mirror to observe their reflection improves their ability to do this (Ainley et al., 2012). This has never been tested in people who have a diagnosis of BDD, which was why we asked you to estimate your heart rate when looking at a blank screen and in a mirror.

If you feel that you have been affected by any aspect of the study, you can contact any of the research team to discuss how this affected you, and they can help you think about possible

routes for support that may be helpful. Their contact details are listed at the end of this information sheet.

If you would prefer not to talk to the research team, you may wish to contact the BDD support group which is run by the Priory Hospital in North London, or discuss your feelings with your GP or local Improving Access to Psychological Therapies Service. The researcher will give you a separate sheet with all of these contacts. You can also contact Michelle Pratt at michelle.pratt.2011@live.rhul.ac.uk if you have any further questions regarding the study.

Research team contact details

Michelle Pratt – Trainee Clinical Psychologist at RHUL

Michelle.pratt.2011@live.rhul.ac.uk / 01784 414012

Dr Abigail Wroe – Clinical Psychologist and Clinical Tutor at RHUL

abigail.wroe@rhul.ac.uk / 01784 276 532

Dr Blake Stobie – Consultant Clinical Psychologist at the Centre for Anxiety Disorders and Trauma (Institute of Psychiatry)

blake.stobie@kcl.ac.uk / 020 322 82101

Organisations to contact for further information or support

If you feel that the current study has raised any issues for you personally and you would like further support, there are a number of people you could choose to contact for further information or support.

If you feel you would like to talk through how you are feeling, you are welcome to contact a member of the research team. Abigail Wroe and Blake Stobie, who are Clinical Psychologists and part of the research team, will be happy to discuss any issues you may feel concerned about. Their contact details are provided below;

Dr Abigail Wroe – Clinical Psychologist and Clinical Tutor at RHUL

abigail.wroe@rhul.ac.uk / 01784 276 532

Dr Blake Stobie – Consultant Clinical Psychologist at the Centre for Anxiety Disorders and Trauma (Institute of Psychiatry)

blake.stobie@kcl.ac.uk / 020 322 82101

If you would prefer to talk with someone outside of the research team, you could consider the following options;

2. You are welcome to contact the BDD support group which is run by the Priory Hospital in North London if you would like further information or support or have any concerns that have arisen since taking part in the study. Information on the group and meeting dates and times can be requested by emailing **northlondon@priorygroup.com** or telephoning **020 8882 8191**.

3. Your **general practitioner** (GP) will be able to advise and support you with any concerns you may have and may be able to refer you to a service that can offer you further advice or counselling.

Appendix 7: Student participant debrief information

Body Dysmorphic Disorder and processing of bodily sensations

Thank you for your time and for taking part in this study today. The aim of the current study is to understand more about the way that people with a diagnosis of Body Dysmorphic Disorder (BDD) process and experience their bodily sensations.

The ability to recognise and monitor bodily sensations has been reported to vary between different people. For example, it has been reported that people with a diagnosis of anxiety may be more aware of their bodily signals (such as their heart rate) when compared to people without a diagnosis of anxiety (Ehlers et al., 2000). Conversely, people with a diagnosis of an eating disorder may find it more difficult to identify their bodily signals (Pollatos et al., 2008). People with a diagnosis BDD experience anxiety around their physical appearance. Previously, their ability to monitor their bodily sensations has not been investigated.

If people find it difficult to identify their bodily signals it may mean that they pay more attention to their external qualities, such as the way they look, than their internal qualities (such as humour or kindness).

If this research highlights that people with a diagnosis of BDD find it difficult to identify their internal signals, it may partly explain why such an emphasis is placed on their physical appearance, which can cause people with this diagnosis to experience distress. The heart beat estimating task which you completed has been shown to be a good indicator of how aware people are of their bodily sensations.

If reduced bodily sensation awareness was identified in participants with a diagnosis of BDD, different factors may explain this. This study explored whether what people pay attention to, what they believe that other people think about them, and what they think of their own body is linked to how easily they can identify their own bodily signals. This information was collected using the questionnaires that you completed.

For people who find it difficult to estimate their heart rate (an internal bodily sensation), it has been found that using a mirror to observe their reflection improves their ability to do this (Ainley et al., 2012). This has never been tested in people who have a diagnosis of BDD, which was why we asked you to estimate your heart rate when looking at a blank screen and in a mirror.

If you feel that you have been affected by any aspect of the study, you can contact any of the research team to discuss how this affected you, and they can help you think about possible routes for support that may be helpful. Their contact details are listed at the end of this information sheet.

If you would prefer not to talk to the research team, you may wish to contact the BDD support group which is run by the Priory Hospital in North London, or discuss your feelings with your GP or local Improving Access to Psychological Therapies Service. The researcher will give you a separate sheet with all of these contacts. You can also contact Michelle Pratt at michelle.pratt.2011@live.rhul.ac.uk if you have any further questions regarding the study.

Research team contact details

Michelle Pratt – Trainee Clinical Psychologist at RHUL

Michelle.pratt.2011@live.rhul.ac.uk / 01784 414012

Dr Abigail Wroe – Clinical Psychologist and Clinical Tutor at RHUL

abigail.wroe@rhul.ac.uk / 01784 276 532

Dr Blake Stobie – Consultant Clinical Psychologist at the Centre for Anxiety Disorders and Trauma (Institute of Psychiatry)

blake.stobie@kcl.ac.uk / 020 322 82101

Organisations to contact for further information or support

If you feel that the current study has raised any issues for you personally and you would like further support, there are a number of people you could choose to contact for further information or support.

If you feel you would like to talk through how you are feeling, you are welcome to contact a member of the research team. Abigail Wroe and Blake Stobie, who are Clinical Psychologists and part of the research team, will be happy to discuss any issues you may feel concerned about. Their contact details are provided below;

Dr Abigail Wroe – Clinical Psychologist and Clinical Tutor at RHUL

abigail.wroe@rhul.ac.uk / 01784 276 532

Dr Blake Stobie – Consultant Clinical Psychologist at the Centre for Anxiety Disorders and Trauma (Institute of Psychiatry)

blake.stobie@kcl.ac.uk / 020 322 82101

If you would prefer to talk with someone outside of the research team, you could consider the following options;

1. Your **general practitioner** (GP) will be able to advise and support you with any concerns you may have and may be able to refer you to a service that can offer you further advice or counselling.
2. Royal Holloway runs a **student counselling service** which offers to support students who are coping with emotional issues that can often be difficult to cope with (such as feelings of depression and anxiety). You can contact the student counselling service by emailing them at **counselling@rhul.ac.uk**, or by calling them on **01784 443128.**
3. You are welcome to contact the **BDD support group** which is run by the Priory Hospital in North London if you would like further information or support or have any concerns that have arisen since taking part in the study. Information on the group and meeting dates and times can be requested by emailing **northlondon@priorygroup.com** or telephoning **020 8882 8191**.

Appendix 8: NHS ethics approval

12 August 2013

Dr Michelle Pratt
Trainee Clinical Psychologist
Camden and Islington NHS trust
Department of Clinical Psychology
Royal Holloway, University of London
Egham Hill, Egham
TW20 0EX

Dear Dr Pratt

Study title:	**Interoceptive awareness in Body Dysmorphic Disorder**
REC reference:	**13/LO/0760**
IRAS project ID:	**124304**

Thank you for your letter of 23 July 2013, responding to the Committee's request for further information on the above research and submitting revised documentation.

The further information has been considered on behalf of the Committee by the Chair.

We plan to publish your research summary wording for the above study on the NRES website, together with your contact details, unless you expressly withhold permission to do so. Publication will be no earlier than three months from the date of this favourable opinion letter. Should you wish to provide a substitute contact point, require further information, or wish to withhold permission to publish, please contact the Co-ordinator Miss Tina Cavaliere, nrescommittee.london-riverside@nhs.net.

Confirmation of ethical opinion

On behalf of the Committee, I am pleased to confirm a favourable ethical opinion for the above research on the basis described in the application form, protocol and supporting documentation as revised, subject to the conditions specified below.

Ethical review of research sites

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NHS sites

The favourable opinion applies to all NHS sites taking part in the study, subject to management permission being obtained from the NHS/HSC R&D office prior to the start of the study (see "Conditions of the favourable opinion" below).

Non-NHS sites

Conditions of the favourable opinion

The favourable opinion is subject to the following conditions being met prior to the start of the study.

Management permission or approval must be obtained from each host organisation prior to the start of the study at the site concerned.

Management permission ("R&D approval") should be sought from all NHS organisations involved in the study in accordance with NHS research governance arrangements.

Guidance on applying for NHS permission for research is available in the Integrated Research Application System or at http://www.rdforum.nhs.uk.

Where a NHS organisation's role in the study is limited to identifying and referring potential participants to research sites ("participant identification centre"), guidance should be sought from the R&D office on the information it requires to give permission for this activity.

For non-NHS sites, site management permission should be obtained in accordance with the procedures of the relevant host organisation.

Sponsors are not required to notify the Committee of approvals from host organisations

It is the responsibility of the sponsor to ensure that all the conditions are complied with before the start of the study or its initiation at a particular site (as applicable).

Approved documents

The final list of documents reviewed and approved by the Committee is as follows:

Document	Version	Date
Covering Letter	27.04.2013	
Covering Letter		23 July 2013
Evidence of insurance or indemnity		01 August 2012
Investigator CV	Michelle Pratt	03 May 2013

Investigator CV	Blake Stobie	07 May 2013
Investigator CV	Abigail Wroe	07 May 2013
Investigator CV	Manos Tsakiris	07 May 2013
Other: Risk Management Protocol		26 April 2013

Other: Organisations to contact for support - clinical participant		26 April 2013
Other: Organisations to contact for support - non-clinical participant		26 April 2013
Other: Participant debrief sheets - clinical participant		26 April 2013
Other: Participant debrief sheets - non-clinical participant		
Other: RHUL approval to apply for NHS	1	17 December 2012
Participant Consent Form	1	26 April 2013
Participant Information Sheet: PIS for clinical participant	1	26 April 2013
Participant Information Sheet: PIS for non-clinical participant	1	26 April 2013
Participant Information Sheet: Clinical participant (preferred)	2 - Clean & Tracked	17 June 2013
Participant Information Sheet: Clinical participant (non-preferred)	2 - Clean & Tracked	17 June 2013
Participant Information Sheet: Student participant (preferred)	2 - Clean & Tracked	17 June 2013
Participant Information Sheet: Student participant (non-preferred)	2 - Clean & Tracked	17 June 2013
Protocol	1	26 April 2013
Questionnaire: Body Image Questionnaire		
Questionnaire: PHQ-9		
Questionnaire: GAD-7 Questionnaire		
Questionnaire: Self-objection questionnaire		
Questionnaire: Focus of Attention Questionnaire		
REC application	3.5	07 May 2013
Response to Request for Further Information		23 July 2013

Statement of compliance

The Committee is constituted in accordance with the Governance Arrangements for Research Ethics Committees and complies fully with the Standard Operating Procedures for Research Ethics Committees in the UK.

After ethical review

<u>Reporting requirements</u>

The attached document *"After ethical review – guidance for researchers"* gives detailed guidance on reporting requirements for studies with a favourable opinion, including:

- Notifying substantial amendments
- Adding new sites and investigators
- Notification of serious breaches of the protocol

- Progress and safety reports
- Notifying the end of the study

The NRES website also provides guidance on these topics, which is updated in the light of changes in reporting requirements or procedures.

Feedback

You are invited to give your view of the service that you have received from the National Research Ethics Service and the application procedure. If you wish to make your views known please use the feedback form available on the website.

Further information is available at National Research Ethics Service website > After Review

13/LO/0760	Please quote this number on all correspondence

We are pleased to welcome researchers and R & D staff at our NRES committee members' training days – see details at http://www.hra.nhs.uk/hra-training/

With the Committee's best wishes for the success of this project.

Yours sincerely

Pp *[signature]*
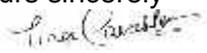
Dr Sabita Uthaya
Chair

Email: nrescommittee.london-riverside@nhs.net

Enclosures: "After ethical review – guidance for
                          researchers"

Copy to: *Dr Abigail Wroe*
                          Mrs Jennifer Liebscher, Institute of Psychiatry

Appendix 9: London NHS trust approval

Institute of Psychiatry

Research and
Development
Office

Box P005
De Crespigny Park
Denmark Hill
London SE5 8AF
Tel +44 (0)20 7848 0790
Fax +44(0)20 7848 0147
www.iop.kcl.ac.uk/RandD

KING'S College
LONDON
Founded 1829

at The Maudsley

Dr Michelle Pratt
Department of Clinical Psychology
Royal Holloway, University of London
Egham Hill
Egham
TW20 0EX

13 September 2013

Dear Dr Pratt

Trust Approval: R&D2013/083
Title: Interoceptive awareness in Body Dysmorphic Disorder
REC Reference: 13/LO/0760

I am writing to confirm approval for the above research project at South London and Maudsley NHS Foundation Trust. This approval relates to work in the Mood, Anxiety and Personality CAG and to the specific protocol and informed consent procedures described in your R&D Form. Any deviation from this document will be deemed to invalidate this approval. Your approval number has been quoted above and should be used at all times when contacting this office about this project.

Amendments, including extending to other Trust directorates will require further approval from this Trust and where appropriate the relevant Research Ethics Committee. Amendments should be submitted to this R&D Office by completion of an R&D Amendment form together with any supporting documents. A copy of this is attached (R and D Amendment Form V3.doc), but is also available on the R&D Office website.
King's College London - Research and development approval

I note that Royal Holloway, University of London will be taking on the role of Sponsor for this study.

Approval is provided on the basis that you agree to adhere to the Department of Health's Research Governance requirements including:

- Ethical approval must be in place prior to the commencement of this project.

- As Chief Investigator and/or Principal Investigator for this study you have familiarised yourself with, and accept the responsibilities commensurate with this position, as outlined in the Research Governance Framework
  http://www.dh.gov.uk/prod_consum_dh/groups/dh_digitalassets/@dh/@en/documents/digitalasset/dh_4122427.pdf.

South London and Maudsley **NHS**
NHS Foundation Trust

- Compliance with all policies and procedures of the Trust which relate to research, and with all relevant requirements of the Research Governance Framework. In particular the Trust Confidentiality Policy.
  http://www.slam.nhs.uk/media/107386/confidentiality%20policy.pdf
  .

- Co-operating with the Trust R&D Office's regular monitoring and auditing of all approved research projects as required by the research governance framework, including complying with ad hoc requests for information.

- Informing the Trust's Health and Safety Coordinators and/or the Complaints Department or of any adverse events or complaints, from participants recruited from within this Trust, which occurs in relation to this study in line with Trust policies. Contact details are available from the R&D Office if required.

- Sending a copy of any reports or publications which result from this study to the Trust Departments involved in the study if requested.

- Honorary Contracts must be in place prior to patient contact for all relevant members of the research team. Advice on this will be provided by the R&D Office at the point of obtaining R&D approval and on an ongoing basis for new members of staff joining the research team.

- Sending a copy of the annual reports and end of project notification submitted to ethics.

Failure to abide by the above requirements may result in the withdrawal of the Trust's approval for this research.

If you wish to discuss any aspect of this research approval with the R&D Office, please contact Jenny Liebscher jennifer.liebscher@kcl.ac.uk in the first instance.

I wish you every success with this study.

Yours sincerely

Adriana Fanigliulo
Research Governance Facilitator
SLaM/IoP R&D Office

Enc. R&D Approval Amendment Form

Appendix 10: Royal Holloway Ethics Committee approval

From: Psychology-Webmaster@rhul.ac.uk <Psychology-Webmaster@rhul.ac.uk>
Sent: Thursday, August 22, 2013 3:13 PM
To: nwjt087@rhul.ac.uk; Wroe, Abigail
Cc: PSY-EthicsAdmin@rhul.ac.uk; Leman, Patrick
Subject: Ref: 2013/071 Ethics Form Approved

Application Details:

Applicant Name: **Michelle Pratt**

Application title: **Interoceptive awareness in Body Dysmorphic Disorder**

Comments:

Approved.
I note this has been approved by NHS. However, the reviewers identified some issues that may require attention. I am pasting their comments in for information.

Reviewer 1.
Will participants sign a form to give consent? What is the format of this form? Could we see the wording of the debrief sheet? The info doesn't mention that they can omit any questions they don't want to answer. If NHS approval depends on using these exact documents than no need to change.

Reviewer 2.
Generally fine. Please make it clear that participants are permitted to leave blank any questionnaire items which they are uncomfortable answering. Please include in Section C2 the approximate duration of the testing session. Finally, please add to the information above whether there will be any incentive (monetary or otherwise) offered to the participants - the student consent form currently has 'X credits' so this will need to be specified for the final version..

Appendix 11: Risk management protocol

Risk management protocol

Clinical participants

If participants in either clinical group disclose clinically relevant information, or information which suggests that they may be at risk of harm, the following protocol will be followed;

- If information is disclosed which is clinically relevant, but does not indicate that the participant is at risk of harm, this will be discussed with the client. The client will be encouraged to share this information with their responsible clinician (who they are seeing for treatment), and the lead researcher will offer to communicate this information for them if they would prefer this
- If information is disclosed which indicates that the participant or another person is at risk of harm, the participant will be reminded of the bounds of confidentiality (which will be outlined at the beginning of the experimental session) and the need for this information to be communicated with another clinician. Dependant on what the participant reports, this may lead to a structured risk assessment being carried out with a clinician at CADAT.
- Participants will be invited to speak with any member of the research team, including Dr. Blake Stobie, who is a Consultant Clinical Psychologist with particular expertise in relation to BDD
- If participants would prefer to speak to somebody outside of the research team, they will be encouraged to contact a BDD support group which runs at the Priory Hospital in London for further support

Non-clinical participants

If participants in the non-clinical group disclose clinically relevant information, the following protocol will be followed;

- Participants will be invited to speak with any member of the research team, including Dr. Blake Stobie, who is a Consultant Clinical Psychologist with particular expertise in relation to BDD
- If participants would prefer to speak to somebody outside of the research team, they will be encouraged to contact a BDD support group which runs at the Priory Hospital in North London for further support
- Alternatively, they will be directed to contact their GP, who could direct them to local services which provide advice and counselling
- They will also be given the contact details of the free counselling service which is run for RHUL students at the university

Appendix 12: POLAR pulse detection strap

Appendix 13: POLAR watch

We are interested in how people think about their bodies. The questions below identify 10 different body attributes. We would like you to *rank order* these body attributes from that which has the *greatest impact* on your physical self-concept, to that which has the *least impact* on your physical self-concept.

Note: It does not matter *how* you describe yourself in terms of each attribute. For example, fitness level can have a great impact on your physical self-concept regardless of whether you consider yourself to be physically fit, not physically fit, or any level in between.

Please first read over all of the attributes simultaneously. Then record your rank by writing the letter of the attribute in the appropriate place on the scale, from most important to your physical self-concept, down to the least important.

a) physical coordination   f) physical attractiveness

b) health   g) energy level (e.g., stamina)

c) weight   h) firm/sculpted muscles

d) strength   i) physical fitness level

e) sex appeal   j) measurements (e.g., chest, waist, hips)

<u>Letter of Attribute</u>

Most important………… _____
Second most important ..._____
Third most important…... _____
Fourth most important …._____
Fifth most important……._____
Sixth most important…... _____
Seventh most important ..._____
Eighth most important…. _____
Ninth most important……_____
Least important………… _____

Appendix 15: Focus of Attention Questionnaire

Instructions to respondents;

Please circle the number on the scale below each question that best corresponds to your experience during the task that you just completed.

1) **I was focussing on the other person's appearance or dress**

Not at all	Somewhat	To a moderate degree	Mostly	Totally
1	2	3	4	5

2) **I was focussing on the features or conditions of the physical surroundings (e.g. appearance, temperature)**

Not at all	Somewhat	To a moderate degree	Mostly	Totally
1	2	3	4	5

3) **I was focussing on what I would say or do next**

Not at all	Somewhat	To a moderate degree	Mostly	Totally
1	2	3	4	5

4) **I was focussing on the impression I was making on the other person**

Not at all	Somewhat	To a moderate degree	Mostly	Totally
1	2	3	4	5

5) **I was focussing on how the other person might be feelings about himself / herself**

Not at all	Somewhat	To a moderate degree	Mostly	Totally
1	2	3	4	5

6) **I was focussing on what I thought of the other person**

Not at all	Somewhat	To a moderate degree	Mostly	Totally
1	2	3	4	5

7) **I was focussing on my level of anxiety**

Not at all	Somewhat	To a moderate degree	Mostly	Totally
1	2	3	4	5

8) I was focussing on what the other person was saying or doing

Not at all	Somewhat	To a moderate degree	Mostly	Totally
1	2	3	4	5

9) I was focussing on my internal bodily reactions

Not at all	Somewhat	To a moderate degree	Mostly	Totally
1	2	3	4	5

10) I was focussing on past social failures

Not at all	Somewhat	To a moderate degree	Mostly	Totally
1	2	3	4	5

Appendix 16: Cosmetic Procedure Screening Questionnaire for Body Dysmorphic Disorder

PHQ-9

Over the <u>last 2 weeks</u>, how often have you been bothered by any of the following problems? (*Use "✓ or circle the number"* *to indicate your answer*)	**Not at all**	**Several days**	**More than half the days**	**Nearly every day**
1. Little interest or pleasure in doing things	0	1	2	3
2. Feeling down, depressed, or hopeless	0	1	2	3
3. Trouble falling or staying asleep, or sleeping too much	0	1	2	3
4. Feeling tired or having little energy	0	1	2	3
5. Poor appetite or overeating	0	1	2	3
6. Feeling bad about yourself – or that you are a failure or have let yourself or your family down	0	1	2	3
7. Trouble concentrating on things, such as reading the newspaper or watching television	0	1	2	3
8. Moving or speaking so slowly that other people could have noticed? - Or the opposite – Being so fidgety or restless that you have been moving around a lot more than usual	0	1	2	3
9. Thoughts that you would be better off dead or of hurting yourself in some way	0	1	2	3
(For office coding: Total Score _____ = _____ + _____ + _____)				

GAD-7

Over the <u>last 2 weeks</u>, how often have you been bothered by any of the following problems? (*Use* "✓**or circle the number**" *to indicate your answer)*	Not at all	Several days	More than half the days	Nearly every day
1. Feeling nervous, anxious or on edge	0	1	2	3
2. Not being able to stop or control worrying	0	1	2	3
3. Worrying too much about different things	0	1	2	3
4. Trouble relaxing	0	1	2	3
5. Being so restless that it is hard to sit still	0	1	2	3
6. Becoming easily annoyed or irritable	0	1	2	3
7. Feeling afraid as if something awful might happen	0	1	2	3
(For office coding: Total Score _____ = _____ + _____ + _____)				