



Childhood Adversity in Body Dysmorphic Concerns

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Introduction: Thesis Overview

The aim of this section is to provide an overview of the thesis. The reader is introduced to several important concepts, and a brief introduction to the topic of body dysmorphic disorder is presented. The purpose and structure of the thesis is described, which comprises a systematic review (chapter 1) and an empirical study (chapter 2).

Dysmorphic concern, an excessive concern with a slight or imagined defect in physical appearance, was first described in psychiatric literature as “Dysmorphophobia” (Morselli, 1886) and included in formal diagnostic systems in 1980 (American Psychiatric Association [APA], 1980). It has since undergone several changes including in title, to body dysmorphic disorder (APA, 1987), and classification, with a move from the atypical somatoform disorders section of the Diagnostic and Statistical Manual, to its inclusion as an Obsessive-compulsive and related disorder, with Muscle dysmorphia added as a specifier (APA, 2013).

Guided by these diagnostic classifications, much research has focused on dysmorphic concern as a manifestation of body dysmorphic disorder (BDD). Others propose that a symptom focused approach (Oosthuizen, Lambert, & Castle, 1998) where BDD lies at the end of a body image continuum (Rosen & Ramirez, 1998) could be more fruitful in understanding the nature of this clinical problem, with a move away from the stigmatizing and restrictive language of diagnosis. In this thesis, dysmorphic concern as a symptom and body dysmorphic disorder as a clinical diagnosis are both considered throughout.

There have been several developmental models proposed for BDD which incorporate biological, psychological and cultural factors, of which cognitive-behavioural models have received the most attention and support (Cororve & Gleaves, 2001). Such theories implicate

several important mechanisms in the maintenance of BDD but are less clear regarding its development (Neziroglu, Khemlani-Patel, & Veale, 2008). In the context of childhood operant conditioning, there is a role implicated for early experience which negatively reinforces an individual for physical appearance, contributing to negative core beliefs about the self and the value of physical attractiveness. Adverse childhood experiences are associated with a range of adult mental health problems, including depression, anxiety disorders, substance misuse and psychosis (Green et al., 2010; Varese et al., 2012). The potential impact of these types of events in the evolution of BDD has not been studied extensively.

The systematic review in Chapter 1 synthesizes evidence for the role of childhood adversity in BDD. This includes a background to the area, a detailed description of the review process, and appraisal and synthesis of current research evidence. In summary, experiences of sexual and emotional abuse, including victimisation and teasing aimed at physical appearance appear to be strongly associated with dysmorphic concern and BDD.

Although the review concludes that there is evidence for a relationship between childhood adversity and body dysmorphic disorder, it also highlights a paucity of research in the area and identifies particular gaps in the literature. Specifically in light of the finding that appearance-focused teasing is implicated in the development of BDD, Chapter 2, the empirical paper, seeks to explore this further. Recognizing dysmorphic concern as the central concept in BDD, the study examines the role of specificity in the relationship between appearance-focused teasing and dysmorphic concern in a University sample. The chapter provides an introduction and rationale for the study. An online survey method was selected to attend to the aims and objectives of the study, and findings are analysed and reported using carefully selected quantitative methods. Participants who recalled a specific focus to appearance teasing during childhood (i.e. teasing aimed at a specific body part) were found to

have significantly higher levels of body dysmorphic concern, than those who were teased more generally about their appearance, or not at all. However, specificity did not moderate the relationship between frequency of appearance teasing and dysmorphic concern in further analyses. A discussion of the findings in relation to existing research evidence and clinical practice is provided and limitations of the study are discussed along with recommendations for future research.

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Chapter 1

**Childhood Adversity and Body Dysmorphic Disorder:
A Systematic Review**

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Abstract

Adverse experiences during childhood have been implicated in the development of distorted body image and body dysmorphic disorder (BDD). Despite growing evidence showing the role of dysfunctional cognitions in maintaining BDD, there has been less research examining the role of specific types of early experience that may act as risk factors for developing dysmorphic concerns. The purpose of the current paper was to review the evidence for the role of childhood adversity in the development of BDD. To address the identified gap, a systematic search protocol was developed to facilitate identification, data extraction and quality appraisal of relevant published studies. Papers were included if they examined directly the relationship between childhood adversity and current body dysmorphic concerns. Ten studies were included for review. In conclusion, despite variation in the quality of studies, limited but consistent evidence indicates an association between childhood adversity and BDD. Specifically, experiences of sexual and emotional abuse, including victimisation and teasing aimed at physical appearance are more strongly associated with BDD.

Keywords: Body dysmorphic disorder, dysmorphic concerns, childhood adversity

Childhood Adversity and Body Dysmorphic Disorder: A Systematic Review

Body dysmorphic disorder (BDD) is a diagnosis applied to individuals who are substantially distressed by a slight or perceived defect in their appearance (American Psychiatric Association [APA], 2013). While such defects are often unnoticeable to others, affected individuals may spend several hours each day preoccupied with their appearance, often engaging in repetitive behaviours including mirror checking, excessive grooming, skin picking and reassurance seeking or mental acts, such as comparing appearance with others'. The most common preoccupations involve the face or head, including the skin, hair, or nose, but any body part may be the focus of concern (Phillips, McElroy, Keck., Pope, & Hudson, 1993).

There are gender differences for BDD in terms of specific dysmorphic concerns, with females tending to report preoccupations related to hips, breasts, weight and legs while men report concerns about genitals, height, body hair and muscular build (Phillips & Diaz, 1997). Due to the frequency of distress specifically focussed on fat percentage and muscularity in men, a sub-type of BDD has been proposed, termed muscle dysmorphia (MD; Maida & Armstrong, 2005). Gender patterns of appearance concerns are likely to reflect cultural attitudes, suggesting that cultural norms and values influence BDD, although this has yet to be directly studied.

Point-prevalence estimates for BDD fall between 1.7-2.4% (Buhlmann et al., 2010; Koran, Abujaoude, Large, & Serpe, 2008) suggesting that it is a common disorder, however there is relatively little empirical research compared to disorders with similar prevalence rates, e.g. social phobia and panic disorder (see Alonso et al., 2004). There may be several reasons for this: BDD was included in psychiatric nomenclature in 1987 (APA, 1987) and so has only begun to receive increased research attention in the past 20 years (Phillips et al., 1993). Additionally, high levels of shame are common in people with BDD, which may lead

to non-disclosure of their concerns to others (Buhlmann, 2011). Furthermore, clinicians may be less familiar with symptoms of BDD than they are with other disorders and similarities with such conditions may lead to misdiagnosis (Buhlmann, 2011). Finally, individuals with BDD may be more likely to seek help from a cosmetic surgeon than a therapist in the first instance (Buhlmann, Greenberg, & Wilhelm, 2011). Importantly, prevalence rates as high as 13% have been reported in student samples (Biby, 1998) and 16% in general adult psychiatric inpatient settings (Conroy et al., 2008). This is especially concerning as a BDD diagnosis is associated with poor quality of life (Veale, 1996), high rates of co-morbid depression (Phillips et al., 2006) and increased rates of suicidal ideation, attempts and completed suicide (Phillips, 2007). Such impairment contributes to substantial costs and suffering at both the individual and societal level, highlighting the importance for furthering our understanding of this disorder.

Risk factors for the development of BDD remain complex and unclear (Feusner, Neziroglu, Wilhelm, Mancusi, & Bohon, 2010). Despite explanations of the development of BDD from several perspectives incorporating biological, psychological and cultural factors, cognitive-behavioural models have received the most attention and empirical support (e.g. Neziroglu, Khemlani-Patel, & Veale, 2008; Veale, 2004). Such models acknowledge a role for biological disposition and cultural influence, but highlight psychological vulnerability, including social and developmental factors in the development of BDD. Here it is argued that hyperawareness of appearance and maladaptive beliefs regarding the importance of attractiveness are central components underlying BDD. These models identify several maladaptive information processing strategies (i.e. selective attention for appearance flaws, threatening interpretation of non-threatening scenarios and overestimating the attractiveness of others); heightened shame, depression and anxiety; and self-defeating, checking ritualistic behaviours to be central to BDD. There is evidence for the effectiveness of CBT based

interventions that target these maladaptive processes and behaviours, (see Williams, Hadjistavropoulos, & Sharpe, 2006 for a review).

Despite a developing evidence base for the processes which may maintain BDD, the possible relationship between early experience and the development of BDD related distress is less well understood. Specifically, models that focus on current maintenance processes do not adequately address how exposure to certain 'general' risk factors lead to the development of the dysfunctional cognitions seen in BDD. Childhood adversities including trauma, abuse and victimisation are estimated to affect up to a third of the general population and are related to a heightened risk of psychiatric disorder generally (Kessler et al., 2010). Childhood abuse has a causal role in many mental health problems including depression, anxiety, post-traumatic stress disorder and eating disorders (Read, Hammersley, & Rudegeair, 2007). There is however, evidence that certain adverse experiences can manifest themselves in specific ways in adulthood. For example, Chapman et al. (2004) found emotional abuse in childhood to be highly correlated with depression in later life, and Mancini, Van Ameringen, and MacMillan, (1995) found physical abuse to be more strongly associated with anxiety disorders. Studies exploring the relationship between childhood experiences of victimization have also found such experiences to be associated with depressive symptoms (Callaghan & Joseph, 1995) and social anxiety (Storch, Brassard, & Masia-Warner, 2003). Roth, Coles, and Heimberg (2002) also found appearance related teasing specifically to be associated with adult experiences of depression and trait anxiety. There may also be certain childhood experiences which are more commonly linked with body image problems generally, for example, childhood sexual abuse has been found to be related to body dissatisfaction in participants with eating disorders (Kearney-Cooke & Striegel-Moore, 1994). Such relationships have also been reported between teasing in childhood and later body dissatisfaction (Eisenberg, Neumark-Sztainer, & Story, 2003; Thompson & Heinberg, 1993).

Liang, Jackson, and McKenzie, (2011) found weight-related teasing to be associated with overweight preoccupation and long-term body dissatisfaction in adults. Studies have found that the frequency of weight related teasing in childhood significantly predicts poor body image later in life (Gleason, Alexander & Somers, 2000) leading to the hypothesis that weight related teasing contributes to the development of eating disorders (Benas & Gibb, 2008). It should be noted that the potential relationships between specific childhood adversities and specific symptom profiles are difficult to discern. First, because any one specific childhood adversity, may represent a more general (or other specific) vulnerability to a disorder, which might also be shared by other disorders. Second, specific symptom profiles in adulthood are very rare. For example many people with BDD will also be affected by anxiety and depression. Controlling for the array of variables involved is difficult and would usually require very large samples and sophisticated statistical techniques.

Such exploration in the area of BDD is in its infancy (Feusner et al., 2010). In a sample of 55 women with a diagnosis of post-traumatic stress disorder (PTSD), Phillips (1996) reports a high proportion of body image concerns, with 20% of participants with PTSD meeting criteria for BDD, suggesting a role for traumatic experience in the development of BDD. This finding is consistent with other studies where rates of BDD have been found to be higher in psychiatric inpatients with PTSD than in those without, although it should be noted that this was the case for rates of depression and anxiety disorder also (Mattia & Zimmerman, 1999). Osman, Cooper, Hackmann, and Veale (2004) assessed spontaneous imagery associated with appearance concerns in 18 participants with BDD and a non-psychiatric control group. Participants with BDD reported experiences of distressing images from early childhood such as being bullied or teased. It was proposed that these early experiences may contribute to distress later in life for an individual with BDD, indicating a role for such childhood experiences in the development of BDD. In a cosmetic surgery

sample, patients dissatisfied following nasal surgery were more likely to have had ‘subjectively normal’ noses before surgery, to have had more than three cosmetic procedures, be depressed with ‘demanding personalities’ and report trauma histories (Constantian et al., 2014). The authors suggested “*BDD may be a model of the disordered adaptation to abuse or neglect; a variant of PTSD*” (p.836).

BDD has been conceptualised in several ways (Cororve & Gleaves, 2001). From the early ‘dysmorphophobia’ (meaning “fear of ugliness”; Morselli, 1886), to its classification in the DSM-5 (APA, 2013) as an obsessive compulsive spectrum disorder, it shares many features with social phobia, depression, OCD and the eating disorders (Buhlmann, Reese, Renaud, & Wilhelm, 2008). Given the central role for body image in BDD, some researchers have questioned whether it would be better classified as an extreme on a continuum of body image rather than a discrete condition (Rosen & Ramirez, 1998). This considered it would be important to explore both diagnosed BDD and varying degrees of dysmorphic concern more generally, when examining developmental risk factors. For this reason, this review uses the term ‘dysmorphic concern’ to describe concerns regarding body features expressed both by those with diagnosed BDD and those in non-clinical samples where such concerns are measured within the context of BDD.

Despite this being an area of increased research interest over the past decade there has, to date, been no systematic attempt to bring together current knowledge regarding social and developmental risk factors for BDD and dysmorphic concerns. Knowledge about what may contribute to the development of BDD will not only advance theoretical conceptualisations but may guide clinicians to identify those individuals who might benefit from specialised interventions, and allow the development of accurate and meaningful formulations of distress. Therefore the purpose of the current paper was to review the evidence for the role of childhood adversity in the development of body dysmorphic concern.

Method

Selection of studies

Eligibility criteria

A systematic database search of studies published in English language from 1987¹ – October 2014 was performed on Medline, Psycinfo, Web of Science and Scopus. Eligibility criteria included studies investigating adult participants (+18 years) from both clinical and non-clinical populations. Specifically, researchers searched for studies employing both a validated measure of BDD, dysmorphic concern or muscle dysmorphia (MD) with direct exploration of the relationship with childhood adversity (CA). To enable an extensive and inclusive search, all methods for assessing and recording CA were included. Studies of any quantitative design were included as long as they explored the relationship between CA and BDD symptomology.

Unpublished research, case studies and qualitative papers were excluded. Exclusion also applied to studies with participants under the age of 18, or those reporting no empirical data regarding the relationship between CA and BDD symptomology.

Search strategy

For the purpose of the review, the term ‘childhood adversity’ described any experience occurring during childhood with the potential for lasting consequences. Terms relating to such events were selected based on the most widely studied experiences in the BDD literature, and sought to represent exposure to physical, emotional, sexual abuse and neglect, bullying and parental loss or separation. Search terms were chosen to capture experience (“*child*hood abuse*”; “*physical abuse*”; “*sexual abuse*”; “*emotional abuse*”;

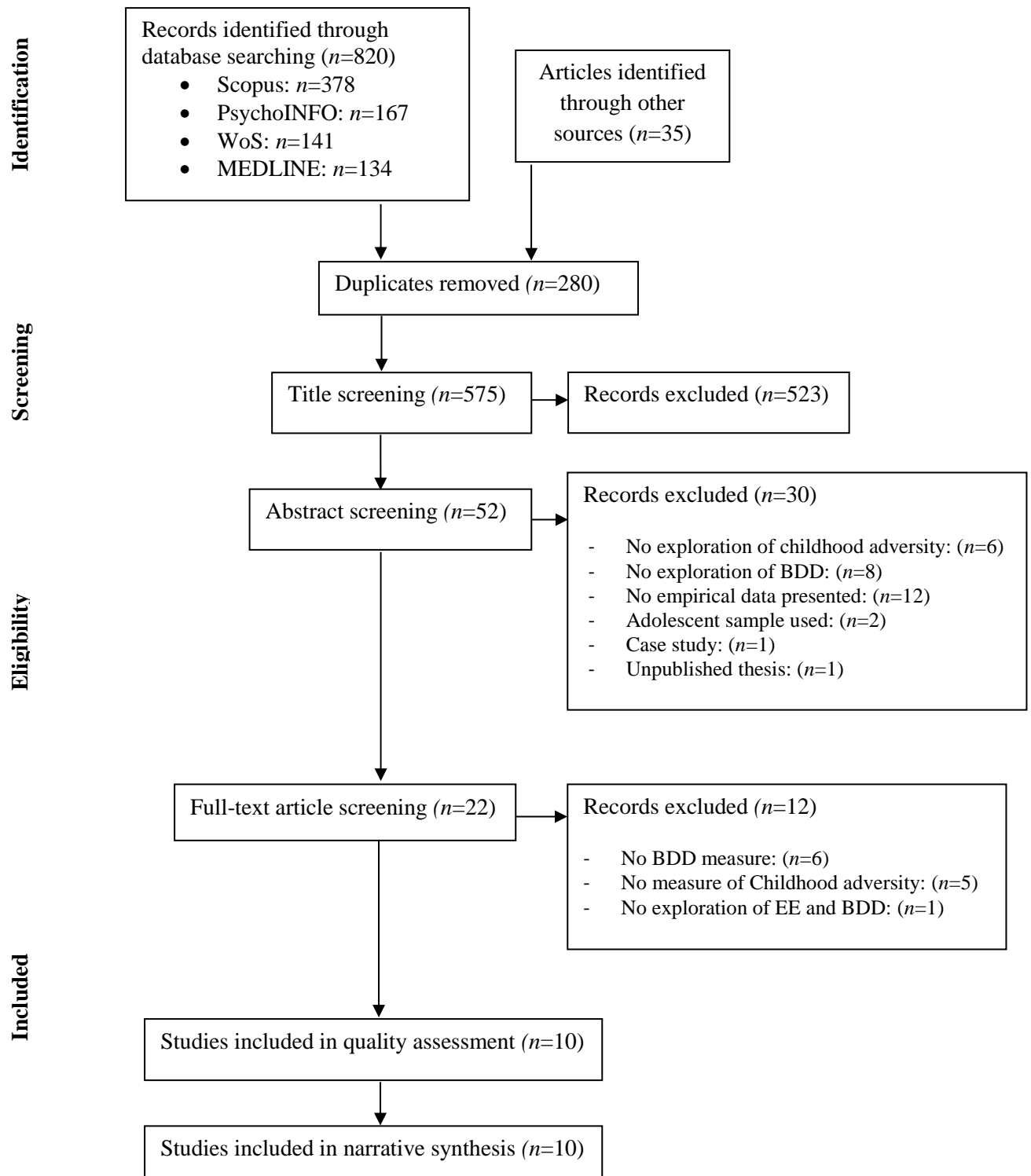
¹ BDD was introduced and accorded diagnostic status in the DSM-III-TR (APA, 1987)

“psychological abuse”; *abuse**; *neglect**; *trauma**; *advers**; *maltreat**; *bully**; *bullied*; *victim**; *teased*; *teasing*; *discriminat**; *“expressed emotion”*; *“parental loss”*; *separate**; *reject**). These were combined using the Boolean operator *“and”* with BDD-related search terms: (*“body dysmorphic disorder”*; *“body dysmorphia”*; *dysmorphia*; *“dysmorphic concern”*; *dysmorphophobia*; *“dysmorphic syndrome”*; *“muscle dysmorphia”*; *bigorexia*).

Reference lists and citations of all eligible articles were also examined to identify further eligible reports not located through database searches, and experts in the field were invited to send relevant reports. A database of the literature identified was assembled and held in Refworks.

The flow of information is reported using the Preferred Reporting Items for Systematic Reviews (PRISMA) diagram (Moher, Liberati, Tetzlaff, & Altman, 2009; Figure 1). The initial search resulted in 820 papers.

Figure 1. Flow of information through the systematic review process (PRISMA)



Study selection

As seen in Figure 1, studies were assessed for inclusion in three stages including title screening; abstract screening and full text article screening. From the electronic database search, duplicate papers were identified and removed, and any papers identified by other means were added. A total of 575 papers were screened by title and the abstracts of 52 papers were reviewed. Studies were selected if they alluded to direct exploration of the relationship between CA and BDD symptomology. A further 30 papers were excluded at this stage. In all, 22 papers were retained and underwent full paper screening, after which a further 12 papers were excluded. See the PRISMA diagram for a detailed description of this process.

Data analysis

Data relating to design, quality and findings were extracted by the researcher using a standardised data extraction form and findings are presented in Table 1. Due to the diverse range of methodologies and outcome measures, statistical methods of synthesising data were not appropriate, as such, findings are summarised narratively. The possible effects of study quality on results are discussed and integrated into conclusions.

Quality assessment

Quality assessment was conducted using an adapted version of critical appraisal skills programme tool for case control studies (CASP, appendix 1). This tool was deemed appropriate for the majority of studies included in the review, and adaptations allowed for the assessment of cross-sectional studies. Each paper was assigned a score ranging from zero (missing/ not addressed) to three (clearly addressed/ rigorous design) for all questions, resulting in a total quality rating out of a possible 21 points, suggesting a poor (0-7); limited (7 – 14); adequate (15 – 18) or excellent (19 – 21) overall quality appraisal. No study was

excluded at this stage of the review process, rather the tool was used to assess studies' methodological quality and further to capture details of relevance and interest in the review.

Appraisal criteria included:

1. Are the results of the study valid?
 - a) Does the study address a clearly focused issue?
 - b) Do the authors use an appropriate method to answer their question?
 - c) Were participants (and controls) recruited in an acceptable way and are they representative of the target population?
 - d) Is the sample size adequate and does it have sufficient statistical power for the study objectives?
 - e) Have confounding factors / limitations been reported and considered in the design?
2. What are the results?
 - a) Are results accurately measured and reported and not biased?
3. Will the findings help locally?
 - a) Does the study have ecological validity?

Overall quality assessment ratings are presented in Table 1, and detailed, individual quality assessment ratings can be found in appendix 2.

Results

Study characteristics

A total of ten studies were included for review and their details are presented in Table 1. Six of these were case control studies and the remaining four were cross-sectional by design. The type of 'childhood adversity' (CA) reported varied across the papers. Those studies exploring participants' trauma histories reported data relating to past sexual, emotional, physical abuse or neglect, sexual harassment, threat to life, pain or bizarre punishment. Four papers investigated the relationship between childhood trauma and BDD in

clinical samples. Of these studies, three were comprised of populations with a primary diagnosis of BDD, made according to DSM criteria, with samples ranging from 37 – 100 including control groups. The fourth study investigated secondary BDD diagnoses in a sample of 70 individuals who had a primary diagnosis of borderline personality disorder. A further two studies explored perceived teasing experiences in clinical samples of size ranging from 33 – 90 including controls. The remaining four papers also investigated the role of victimisation or teasing on dysmorphic symptoms, however these studies did so in non-clinical samples. Of these four studies, two samples were comprised exclusively of male body builders, one, elective cosmetic surgery patients, and one, undergraduate students, with samples ranging from 51– 449.

The following section provides a summary of the main findings followed by a description of the instruments used to measure BDD symptoms across the ten selected studies, and a description of methods employed to collect and record information about CA. Following this is a narrative presentation of the main findings from the papers reviewed.

Table 1. Study characteristics, major findings and quality assessment data

Study	Design	Study outline	Population	Sample	BDD measure	Measure of CA	Major findings	Quality Assessment Rating
Boyda & Shevlin, (2011)	Cross-sectional	Online survey investigating childhood victimisation as a predictor of muscle dysmorphia (MD)	Male body builders	<i>n</i> = 51	MASS	RBQ	Significant correlations between childhood victimisation and depression and anxiety. A direct effect between victimisation and MD, and a mediated effect through anxiety.	11/21 Limited
Buhlmann, Cook, Fama, & Wilhelm, (2007)	Case Control	Investigation of perceived teasing experiences in BDD	BDD & healthy controls	<i>n</i> =16 BDD <i>n</i> =17 healthy controls	SCID BDD-YBOCS	POTS	BDD group reported significantly more appearance and competency related teasing than controls Frequency of appearance related teasing was significantly associated with severity of BDD symptoms	14/21 Limited
Buhlmann, Marques, & Wilhelm, (2012)	Case Control	Investigation of traumatic experiences in BDD	BDD & healthy controls	<i>n</i> =18 BDD <i>n</i> =19 healthy controls	SCID BDD-YBOCS	LEQ-SF	BDD group more likely to report having experienced traumatic events (significant associations for physical and sexual abuse) Also higher levels of emotional abuse, but not significant.	14/21 Limited

Study	Design	Study outline	Population	Sample	BDD measure	Measure of CA	Major findings	Quality Assessment Rating
Buhlmann et al. (2011)	Case Control	Investigation of perceived appearance related teasing in BDD	BDD & healthy controls	<i>n</i> =45 BDD <i>n</i> =45 healthy controls	SCID FKS	yes/no questions regarding teasing	BDD group reported significantly more perceived appearance related teasing. BDD group teased more often by friends or 'others' BDD group remembered incident more vividly and as more traumatic BDD symptom severity was associated with trauma resulting from teasing	16/21 Adequate
Didie et al. (2006)	Case Control	Investigation of rates of abuse and neglect in BDD	BDD	<i>n</i> =75	SCID BDD-YBOCS BDDE	CTQ	79% individuals with BDD reported childhood maltreatment: emotional neglect common across whole sample (68%). emotional abuse (56%); physical abuse (35%); Physical neglect (33%) and sexual abuse (28%). Findings compared with Health Maintenance Organisation data. Severity of abuse was higher than the national average. Severity of sexual abuse was significantly associated with current BDD severity.	15/21 Adequate
Jackson,	Cross-	The	Cosmetic	<i>n</i> = 459	DCQ	Open	Just under half sample (43%)	13/21

Study	Design	Study outline	Population	Sample	BDD measure	Measure of CA	Major findings	Quality Assessment Rating
Dowling, Honigman, Francis, & Kalus, (2012)	sectional	experience of teasing in elective cosmetic surgery patients	surgery patients			ended and multiple choice questions relating to teasing	reported past appearance related teasing. Those who reported appearance teasing showed significantly higher levels of dysmorphic concern, depression and anxiety than non-teased patients.	Limited
Lavell, Zimmer-Gembeck, Farrell, & Webb, (2014)	Cross-sectional	Exploration of appearance based rejection sensitivity as a mediator of the relationship between appearance victimisation and dysmorphic concern	Australian student sample	<i>n</i> = 237	AAI	POTS	Appearance teasing and social anxiety associated with dysmorphic symptoms. Appearance-RS was elevated for those with more dysmorphic symptoms. Appearance-RS fully mediated the relationship between teasing and BDD symptoms, and partially mediated the relationship between social anxiety and BDD symptoms.	15/21 Adequate
Neziroglu, Khemlani-Patel, & Yaryura-Tobias, (2006)	Case Control	Investigation of rates of abuse in BDD	BDD & OCD controls	<i>n</i> =50 BDD <i>n</i> =50 OCD controls	SCID Q-aire	Q-aire.	BDD group reported significantly higher levels of general abuse (38% compared to 14%); specifically sexual (22% v 6%) and emotional abuse (28% v 2%). No significant	10/21 Limited

Study	Design	Study outline	Population	Sample	BDD measure	Measure of CA	Major findings	Quality Assessment Rating
							differences in rates of physical abuse (14% v 8%).	
Semiz et al. (2008)	Case Control	Exploration of prevalence, clinical characteristics and the role of childhood trauma in patients with borderline personality disorder and comorbid BDD	Borderline Personality Disorder & healthy controls	n=70 BPD n=70 healthy controls	SCID	TEC	BDD prevalence in BPD sample was 54% BPD patients with BDD showed significantly higher rates of overall traumatic experiences. Sexual and physical abuse were significantly higher in BDD group. No significant differences found for emotional abuse or neglect Childhood trauma a significant predictor of BDD in BPD patients	8/21 Limited
Wolke & Sapouna, (2008)	Cross-sectional	Childhood bullying experiences in Muscle Dysmorphia	Male body builders	n=100	MDI	Adapted bullying q-aire	21% reported regular bullying experiences. Victimization scores positively correlated with MDI and negatively correlated with self-esteem. Muscle dysmorphia and victimization independently predict global	10/21 Limited

Study	Design	Study outline	Population	Sample	BDD measure	Measure of CA	Major findings	Quality Assessment Rating
							<p>psychopathology and low self-esteem.</p> <p>Functioning was most significantly affected in participants who were bullied <i>and</i> scored high on MDI.</p> <p>Relationship between victimisation and global psychopathology & self-esteem mediated by muscle dysmorphia.</p>	

Note: CA – Childhood adversity; MASS - Muscle Appearance Satisfaction scale; RBQ - Retrospective Bullying Questionnaire; SCID – Structured Clinical Interview for DSM; BDD-YBOCS – Body Dysmorphic Disorder Yale-Brown Obsessive Compulsive Scale; POTS - The Perception of Appearance and Competency Related Teasing Scale; LEQ-SF - Short Version of the Traumatic Stress Institute Life Event Questionnaire; FKS - Body Dysmorphic Symptoms Inventory; BDDE - Body Dysmorphic Disorder Examination; CTQ - Childhood Trauma Questionnaire; DCQ – Dysmorphic concerns questionnaire; AAI - Appearance Anxiety Inventory; Appearance RS - appearance based rejection sensitivity; TEC - Traumatic Experiences Checklist; MDI - Muscle Dysmorphic Inventory; Q-aire - Questionnaire.

Measures

Measures of BDD/dysmorphic concern

A wide range of instruments were used to measure symptoms of BDD and dysmorphic concern. In all six studies using clinical samples, a diagnosis of BDD was made according to DSM-IV criteria. In addition to a research diagnosis, several studies used measures of current BDD severity. The Body Dysmorphic Disorder Modification of the Yale-Brown Obsessive-Compulsive Scale (BDD-YBOCS; Phillips, Hollander, Rasmussen, & Aronowitz, 1997) was used by three studies. This scale has good reliability and validity (Phillips et al., 1997). It has 12 items and comprises a semi-structured interview administered measure of the severity and frequency of BDD symptoms over the past week. Scores range from 0 – 48 where a higher score indicates more severe symptoms.

One study (Didie et al., 2006) used The Body Dysmorphic Disorder Examination (BDDE; Rosen & Reiter, 1996) in addition to the BDD-YBOCS. The scale consists of 34 interview administered items, designed to assess BDD severity over the past month. It has good reported internal consistency ($\alpha=0.81$) and a test-retest reliability coefficient of $r = 0.87$.

One study (Buhlmann et al., 2011) used the Body Dysmorphic Symptoms Inventory (FKS; Buhlmann, Wilhelm, Glaesmer, Brähler, & Rief, 2009). This is an 18 item self-report inventory assessing symptom severity in the past week, with satisfactory internal consistency and discriminant validity (Buhlmann et al., 2009).

Of the non-clinical studies, dysmorphic concern was measured using four different tools. The Dysmorphic Concerns Questionnaire (DCQ; Oosthuizen, Lambert, & Castle, 1998; Mancuso, Knoesen, & Castle, 2010) was employed in the cosmetic surgery sample. This

measure is validated in both clinical and non-clinical samples and discriminates those who would likely meet diagnostic criteria for BDD according to the Body Dysmorphic Disorder Examination (Jorgensen, Castle, Roberts, & Groth-Marnat, 2001).

The Appearance Anxiety Inventory (Veale et al., 2013) was employed in the student sample. This is a 10 item self-report scale with two factors. The first, avoidance, reflects *camouflaging and avoidance* behaviours and the second, *threat monitoring*, reflects checking, rumination and reassurance seeking. Items are rated on a five-point scale and a higher score reflects greater appearance anxiety. The scale is relatively new, but has been found to discriminate between individuals with and without a BDD diagnosis, and has good convergent validity ($r = 0.55$) with the BDD-YBOCS (Veale et al., 2013).

Studies measuring muscle dysmorphia specifically used two different scales to measure MD severity. The Muscle Dysmorphic Inventory (Schlundt, Woodford, & Brownlee, 2000), is a 16 item self-report inventory designed to assess distress and discomfort associated with concern about being too small and not sufficiently muscular. Respondents rate items on a five-point Likert scale, with scores ranging from 0 – 64, where higher scores represent a greater preoccupation with feeling small. Authors report psychometrics for an adaptation of this scale, The Muscle Dysmorphic Disorder Inventory (MDDI), which show the scale to have good discriminate and convergent validity, internal consistency and re-test reliability (Hildebrandt, Walker, Alfano, Delinsky, & Bannon, 2010). However, the adaptation features seven additional and three eliminated items to the original MDI, so psychometrics should be interpreted with caution. The internal reliability of the 16 item version within the sample used was reported as excellent ($\alpha = 0.89$; Wolke & Sapouna, 2008).

The second study of MD used The Muscle Appearance Satisfaction Scale (Mayville, Williamson, White, Netemeyer, & Drab, 2002). This is a 19-item self-report measure developed to measure the cognitive, affective and behavioural dimensions of MD. Responses are also scored on a five-item Likert scale, where higher scores similarly reflect greater MD. The scale has good internal consistency ($\alpha = .87$) and its reported construct validity has been established by its correlations with other measures of BDD (Mayville et al., 2002).

Measures of early adverse experience

Measures of abuse

All studies employed a different method to collect data about childhood adversity. These included one questionnaire method (Neziroglu et al., 2006), where participants were asked to provide a history of abuse in childhood and adolescence up to age 18. This method was not validated, but New York state social services criteria for abuse were followed so as to provide definitions of emotional, physical and sexual abuse and then responses were reviewed by their therapist for validity. Family members were also contacted when appropriate.

Another study (Buhlmann et al., 2011) employed The Short Version of Traumatic Stress Institute Life Event Questionnaire (LEQ-SF; MacIan & Pearlman, 1992). This is a 19 item, self-report inventory designed to assess history and frequency of a range of traumatic life experiences, providing an overall total frequency score. No published reports of the scales validity or reliability are currently available.

The 25 item version of the Childhood Trauma Questionnaire (CTQ; Bernstein & Fink, 1998) was used by one study (Didie et al., 2006). This scale has 25 items across five

subscales assessing physical, emotional and sexual abuse as well as physical and emotional neglect. Scores range from 5 – 25, where a higher score indicates more severe trauma.

Recommended cut-off scores (Bernstein & Fink, 1998) were used to determine the presence and severity of abuse. The scale has adequate test-retest reliability, internal consistency and convergent validity (Bernstein & Fink, 1998).

The Traumatic Experiences Checklist (TEC; Nijenhuis, Van der Hart, & Kruger, 2002) was also used. This is another self-report inventory which covers 29 types of potentially traumatising events to assess a whole childhood trauma history including neglect, emotional and physical abuse, threat to life, pain, bizarre punishment and sexual harassment and abuse. The scale has good internal consistency in clinical samples ($\alpha = 0.86$, retest = 0.90; Nijenhuis et al., 2002).

Measures of victimisation

Of the six papers examining victimisation, only three studies employed validated measures. Two studies employed the Perception of Teasing Scale (POTS; Thompson, Cattarin, Fowler, & Fisher, 1995). This is an 11 item self-report scale, which assesses an individual's history of teasing experiences, with reported reliability and validity (Thompson et al., 1995). The original version of the scale assessed teasing across two domains: weight teasing and competency teasing, however both Buhlmann et al. (2007) and Lavell et al. (2014) modified the weight related scale to assess appearance related teasing, generally. The scale further assesses distress scores for each subscale, representing how significantly the teasing experience affected the individual. Items are rated by participants on a five-item Likert rating scale, and scores on each scale are summed.

A third study employed a modified version of the Retrospective Bullying Questionnaire (RBQ; Schäfer et al., 2004), a 16 item self-report measure capturing a range of verbal, social and physical bullying experiences. Responses are on a 5-point Likert scale and a high total score indicates higher levels of victimization. Schäfer et al. (2004) report internal reliability coefficients comparable to the full RBQ.

Wolke & Sapouna, (2008) employed an adapted bullying questionnaire (Olweus, 1993) asking about various types of victimisation e.g. being kicked, called names, made fun of in childhood or adolescence and further ascertained whether this happened regularly. A respondent is considered a victim of bullying if they reported any victimisation behaviour regularly (2-3 times per month). No psychometric data are available to confirm whether this scale a valid or reliable means of measuring victimisation.

The remaining two studies followed bespoke methods to collect data about bullying experiences using open ended or multiple choice questions (Buhlmann et al., 2011; Jackson et al., 2012).

Main findings

Studies exploring abuse and BDD

Four studies identified in the review examined the relationship between childhood experience of trauma and BDD in clinical samples. All four studies reported a higher rate of traumatic early experience in BDD participants compared with controls and concluded that abuse may be a contributing factor in BDD. In one of the earliest studies, Neziroglu et al. (2006) compared a sample of 50 BDD patients with a gender matched control group of participants with a diagnosis of OCD and found significantly higher levels of abuse reported

by the BDD sample (38%), compared with the OCD group (14%) $\chi^2 = 7.48, p = .006, \phi = .274$) where effect sizes using the Cramer phi coefficient (ϕ) indicate a value of .1 = a small, .3 = a medium and .5 = a large effect. Specifically, BDD participants reported higher rates of emotional (28% vs 2%) $\chi^2 = 13.26, p = .001, \phi = .364$ and sexual abuse (22% v's 6%) $\chi^2 = 5.32, p = .021, \phi = .231$. No such differences were found in rates of physical abuse. Although these findings are promising with regards to developing understanding about the possible relationship between CA and BDD, the study received a 'limited' quality appraisal (10/21), highlighting several limitations in the interpretation of these findings. The method used to capture past abuse was by structured questionnaire, and despite attempts to assign criteria to various types of abuse, this is not a validated measure. Furthermore, the sample reported in this study was small. While the study found that significantly more of the BDD group reported a history of any type abuse than the OCD group, numbers for statistical comparison between subtypes of abuse should be interpreted cautiously, given the extremely low cell values (with no reported use of Fisher's exact test to compensate). Further limits to the generalizability of these findings include that both groups of participants were recruited from a private OCD clinic. It is not known whether these differences would have been evident if the BDD group had been compared with a control group without a psychiatric history. Furthermore, therapists were not blind to the participant groups which may have biased findings.

Despite these limitations, a second study, conducted by Didie et al. (2006) reports comparable findings with regards to the role of a history of emotional abuse in BDD participants. In a group of 75 participants with a BDD diagnosis, taken from a range of referral sources, 79% reported a history of childhood mistreatment, 68% disclosed some form

of emotional neglect and 56% reported a history of emotional abuse. Rates were compared to norms for a Health Maintenance Organisation (HMO) sample of women, and authors found among female participants, that severity ratings of all types of abuse and neglect ranged from .32-.57. The standard deviations were higher than for the HMO sample, although the level of statistical significance was not reported. Furthermore, current BDD severity, as measured by the Y-BOCS was significantly associated with reported sexual abuse. However, sexual abuse did not predict current BDD severity when age and current treatment status were controlled for. These findings were not directly compared with any other sample. This exploratory study has several limitations. Due to the number of significance tests performed, significant findings may have been due to chance. Further, the control group was predominantly white and middle class, and so cannot necessarily be considered representative. Despite these notable limitations, the study employed valid measures and received an appraisal rating of 'adequate' (15/21), with adequate to excellent features across all assessed domains.

A third exploration of the role of trauma in BDD was conducted by Buhlmann et al. (2012) who attempted to overcome the limitations of prior investigations by comparing BDD participants with a healthy control group. This study used validated measures of both BDD severity and trauma history. The BDD group reported having experienced more traumatic events than healthy controls, $t(35) = 2.16, p = 0.04, d = 0.71$, with significant differences between the two groups in terms of reports of both physical ($\chi^2 = 9.11, p = .003, \phi = 0.50$) and sexual ($\chi^2 = 6.10, p = .02, \phi = 0.41$) abuse. Unfortunately, the study was found to be of 'limited' quality (14/21), during critical appraisal, as there were a number of limitations. The study relied upon a small sample with a lack power for detailed statistical exploration. Furthermore, that there was no difference between groups for levels of emotional abuse was

surprising given earlier findings, although the authors report moderate effect sizes in the expected direction despite lack of significance, which suggest this may have been due to the study being underpowered.

Semiz et al. (2008) explored rates of BDD in a sample of patients with borderline personality disorder (BPD). The authors found that the prevalence of BDD in this sample was high, at 54%. In addition, a history of childhood trauma predicted the BDD diagnosis ($\chi^2=30.5$, $df = 8$, $p < 0.001$) when controlling for socio-demographic factors and severity of depressive symptoms. Further, comparisons between the group of participants with and without comorbid BDD revealed significantly higher reports of overall trauma reported by the BDD group, with differences for both physical and sexual abuse. However no significant differences were found for emotional abuse or neglect. The BDD group did however constitute a more 'severely ill' group according to BPD severity, which may also account for the increased trauma experiences. Statistical techniques were used where possible to compensate for the small sample; however the study has several limitations which prevent generalising these findings to a general population, which was reflected in the 'limited' appraisal rating (8/21). Most notably, participants' primary diagnosis of BPD, and inpatient status suggest relatively severe BPD symptoms, which may have resulted in an over representation of BDD.

In summary, these four studies appear to provide preliminary evidence for a relationship between early trauma and a diagnosis of BDD in adulthood. The studies reviewed so far reveal elevated rates of emotional, sexual and physical abuse in BDD samples. However, findings diverge on whether or not specific abusive experiences predispose individuals to developing BDD. This may reflect a) the complicated relationship

between childhood adversity and psychopathology, b) discrepancies in design or c) methodology or study quality. These studies were conducted in either US or Turkish populations, and the majority employed samples predominantly made up of female participants (with the exception of Neziroglu et al., 2006). Further, whether the study utilised validated measures of BDD and early experience, the findings are based upon retrospective self-report. This may open findings up to recall bias, with over-reporting or underreporting of abuse history likely to affect findings. No study attempted to determine the sequence with which CA and BDD developed and the cross-sectional nature of these studies means that causation cannot be inferred.

Studies exploring victimisation and BDD

Two studies explored the relationship between perceived teasing experiences and BDD, both of which provide preliminary evidence for teasing in BDD. The earliest study Buhlmann et al, (2007) compared a sample of 16 BDD participants with 17 healthy controls, employing the Perception of Teasing Scale (POTS), and found that BDD individuals disclosed more appearance teasing $t(31) = 2.08, p = <.05, d = .71$ and competency teasing $t(31) = 2.32, p = .03, d = .80$ than a group of healthy controls, both with medium to large effect sizes. Furthermore, the frequency of appearance related teasing was significantly associated with the severity of BDD symptoms as measured on the BDD-YBOCS. This study suggested that those who experienced prolonged or intense exposure to teasing aimed at their appearance in childhood may go on to develop more severe appearance based concerns. The exploratory nature of this study meant that there were limitations. Structured critical appraisal resulted in a rating of 'limited' (14/21), high-lighting a very small sample size and lack of power for statistical reporting. The findings in this study may have been influenced by

several confounding variables such as high levels of comorbid depression, social phobia or delusional thinking. Furthermore, there was no way of controlling for recall bias in participants who were currently sensitive about their appearance, and therefore more likely to misinterpret or selectively attend to memories from childhood which others might not appraise as distressing.

In an attempt to overcome some of these limitations, Buhlmann et al. (2011) conducted a further exploration of the association between perceived teasing about appearance and BDD using a representative sample of the German population ($n = 2,510$). Using data collected as part of a wider prevalence investigation (Buhlmann et al., 2010) this study identified a group of 45 self-reported BDD participants within the total sample, and matched them with 45 healthy control participants by age and gender. As hypothesised, the BDD group reported significantly more appearance focussed teasing than did the control group (40% v's 15.6%). This group also remembered teasing experiences more vividly and as more traumatic than control participants. Furthermore, BDD severity was significantly associated with trauma experienced as a result of teasing and vividness with which the memory of teasing was recalled. A critical appraisal rating of 'adequate' (16/21) reflected the attempt to overcome the limitations of earlier explorations. Notably, the measure of teasing history employed in this study was not a validated measure, but a bespoke set of questions requesting details about teasing history.

These findings reveal a relationship between perceived teasing experience and BDD, with a particular role for teasing aimed at physical appearance. There are several strengths to employing a population-survey design as in the Buhlmann et al. (2011) study. These include overcoming biases associated with using BDD individuals recruited from treatment clinics;

and a fairer representation of gender than seen in previous studies. However, this is still a small study, and there may be alternative explanations for the above findings. First, as noted, sensitive individuals may simply misinterpret communication in a negative way (as teasing) due to cognitive biases existing prior to the 'teasing incident' which leads them to feel victimised in a situation which someone else might interpret differently. People with BDD may also suffer memory biases for threat information, or simply interpret situations in negative ways. The above studies fail to control for such biases as they rely on retrospective, self-reported data.

Studies exploring victimisation and dysmorphic concerns

Four studies identified explore the relationship between CA and body dysmorphic concerns in non-clinical samples. It was considered relevant and important to consider these findings in light of continuum formulations of BDD (Rosen & Ramirez, 1998).

Two of these papers directly investigate a specific 'type' of BDD, Muscle Dysmorphia (MD). Wolke & Sapouna (2008) distributed questionnaire measures to a group of 100 body builders (individuals who used the gym four times or more per week). Twenty one per cent of the participants reported being victims of bullying during childhood, a finding comparable to rates reported in community samples of primary school children (Due et al., 2005), but higher than that reported in high school samples (Whitney & Smith, 1993). Victimization scores were positively correlated with scores on the MDI ($p = <.05$, $r = 0.21$). Of this group, the authors noted that those who recalled regularly being hit or beaten by peers had higher MD scores, although statistics were not reported. This study found that high scores on MD and bullying victimization independently predicted global psychopathology and low self-esteem. Further, functioning was most significantly affected if participants were

bullied *and* scored high on MDI (significant moderation effect). The authors also found a link between victimisation and global psychopathology and self-esteem, mediated by MDI scores. They concluded that verbal, physical and social forms of childhood victimisation and MD to be strongly associated with concurrent psychopathology. This finding was extended by Boyda & Shevlin, (2011) who tested a mediation model of the relationship between childhood victimisation and MD, both directly, and indirectly, through anxiety and depression. They employed a bodybuilding sample of 89 males, recruited online through bodybuilding discussion forums. This study revealed a significant effect both directly between victimisation and MD, and also a mediating effect of anxiety, which they proposed as a plausible route from childhood victimisation to MD. Thus, victimisation during childhood leads to heightened anxiety, which in turn leads to negative self-evaluation.

These studies provide evidence for a relationship between victimisation generally, and MD. However, with 'limited' critical appraisal findings (scores of 10/21 for Wolke & Sapouna, 2008, and 11/21 for Boyda & Shevlin, 2011) several considerable limitations apply to both. The bodybuilding samples are not representative of the general population. Both groups were made up completely of males, whose willingness to take part in such research might differentiate them from individuals with MD, given what is known about levels of shame and secrecy in BDD (Buhlmann, 2011). Further these studies fail to ascertain the temporal sequencing of victimisation, psychopathology and MD, so it is not inconceivable that MD concerns preceded victimisation or anxiety and depression. Additionally, both studies collected data about general victimisation, and so are unable to infer the possible effects of teasing or victimisation aimed specifically at appearance. Once again, the above

studies are likely to be affected by recall bias, and due to their cross-sectional nature, cannot infer causality. Larger longitudinal studies are required.

Appearance focussed victimisation has been explored as a motivator for undertaking cosmetic surgery, in 449 patients awaiting cosmetic procedures in an Australian clinic (Jackson et al., 2012). Of this sample, 43% indicated a history of teasing related to appearance. Importantly, when compared with participants who did not disclose teasing history, this group reported significantly higher levels of dysmorphic concern ($d=.73$), as well as higher levels of anxiety and depression. Furthermore, teasing contributed to the length of time participants considered surgery as a solution to their appearance concerns, suggesting that teasing contributed to the desire to undergo surgery. Those patients awaiting rhinoplasty or breast surgery were most likely to report a history of teasing. These findings are consistent with the hypothesis that appearance and weight related teasing is associated with body dissatisfaction, specifically dysmorphic concern.

In an attempt to further understand the relationship between appearance teasing and symptoms of BDD, Lavell et al. (2014) hypothesised that appearance based rejection sensitivity (appearance-RS: the tendency to expect, perceive or over-react to signs of rejection based on one's appearance) was a mediator between early experiences of victimisation, social anxiety and dysmorphic concerns in a non-clinical sample of 237 Australian students. Importantly, appearance-RS was found to fully mediate the relationship between perceived appearance based victimisation and BDD symptoms ($b = .12$, 95% CI = .03 - .23, $k^2 = .09$) where Kappa squared (k^2) effect size statistics can be interpreted as small (.01), medium (.09) or large (.25). These findings suggest that a tendency to expect and

perceive rejection related to appearance may be a mechanism for explaining why people who have been teased about their appearance go on to experience heightened BDD symptoms.

Taken together, these two studies in non-clinical samples provide evidence for a relationship between childhood adversities, specifically appearance-focussed teasing and dysmorphic concern. Strengths in design and methodology include that both studies employed large samples which allowed for more sophisticated statistical procedures. However weaknesses, reflected in appraisal ratings of ‘limited’ 13/21 (Jackson et al., 2012) and ‘adequate’ 15/21 (Lavell et al., 2014) include the fact that both studies involved much larger proportions of female participants, although Lavell et al. (2014) made attempts to control for this discrepancy by including gender as a covariate in the model. As with all of the studies employing non clinical samples, it is unclear how directly findings can be generalised to individuals with BDD.

Discussion

The aim of this review was to identify what developmental factors might play a part in the symptoms associated with BDD and if there are specific childhood adversities which may place an individual at increased risk for developing BDD and dysmorphic concerns. All of the studies reviewed indicate a relationship between childhood adversity and BDD. With regards to traumatic experiences, all four papers reported levels of general ‘abuse’ or ‘trauma’ to be higher in individuals with BDD than a control group. Where control groups were comprised of individuals with no mental health diagnosis, findings are consistent with studies which show that childhood abuse is relatively common in psychiatric samples and that childhood abuse may be a non-specific risk factor in the development of a variety of disorders aside from body-image disorders alone (Welch & Fairburn, 1996). However, this

fails to explain why higher rates of abuse are reported in BDD groups when compared with other clinical control groups, such as the participants with OCD or BPD.

Sexual abuse, in particular, was reported more by BDD than control participants in all four studies employing clinical samples. Previous associations have been found between sexual abuse and negative body image (Wenninger & Heiman, 1998), distortion of body image (Byram, Wagner, & Waller, 1995) and eating disorders (Kearney-Cooke & Striegel-Moore, 1994). Polivy & Herman, (2002) hypothesised that sexual abuse impacts upon the development of body image and increases the risk of related emotional disorders. It is possible that this is true also in the development of BDD. Fallon & Ackard (2002) argue that sexual abuse commonly leads to disturbances in body image including body dissatisfaction, shame and distortion. This, they propose occurs because of the nature of sexual abuse and its ability to draw attention towards a victim's body which then has the potential to develop into a preoccupation on that body part, or lead more generally to excessive attention on physical appearance, particularly when abuse occurs during adolescence due to the critical time in which body image develops.

Findings are less clear with regards to other types of abusive experience. Emotional abuse and neglect were reported more by BDD groups than controls in two studies (Didie et al., 2006; Neziroglu et al., 2006). A developmental extension of the hopelessness theory of depression (Rose & Abramson, 1992) posits that emotional abuse during childhood may contribute to a cognitive vulnerability for depression. Under repeated emotional abuse, a child develops negative self-attributions which overtime may increase vulnerability to experiencing depression (Rose & Abramson, 1992). Furthermore, there is evidence that negative cognitions mediate the relationship between early experiences of emotional abuse

and depression in adulthood (Gibb et al., 2001). Researchers propose that emotional abuse and verbal victimisation by family members or peers may be a non-specific risk factor for several disorders and that there may be developmental pathways that are specific to different disorders (Benas & Gibb, 2008).

Findings were also inconsistent regarding a relationship between physical abuse and BDD. This inconsistency might indicate discrepancies in a complex and little understood pathway between childhood adversity and certain psychopathology, or they may be in part due to differences in samples and methodology. Unfortunately, divergences in instruments employed to measure the constructs in question meant that direct quantitative comparison was not possible in this review. Further, samples range from those with secondary BDD, currently hospitalised related to a primary diagnosis of BPD, to non-clinical groups of students.

Similarly, both studies investigating childhood teasing experiences and BDD concluded that individuals with BDD were teased more than controls. Further, each of the four non-clinical papers revealed teasing/victimisation to be associated with BDD/MD symptom severity. These findings are consistent with previous research which has found perceived teasing to be associated with body image dissatisfaction (Eisenberg et al., 2003), suggesting that it is possible that teasing incidents in childhood are related to the development of BDD cognitions.

Importantly, the more participants were teased about their appearance, the more severe their current BDD symptoms were (Buhlmann et al., 2007) and the more vividly and traumatic they remembered the teasing (Buhlmann et al., 2011). This dose response

relationship suggests that physically vulnerable children who are the repeated victims of teasing may be at particularly high risk of developing problems associated with body image.

Even amongst non-clinical samples, studies consistently report that participants who recall teasing either generally or aimed specifically at appearance reported significantly increased levels of dysmorphic concern regardless of how it was measured. While previous studies have reported higher levels of psychological morbidity generally in individuals with continued victimisation experiences (e.g. Olweus, 1993), the current findings provide preliminary evidence that while global psychopathology is clearly impacted by such experiences, this is compounded in dysmorphic concern. Children who are victimised verbally, socially or physically may be at increased risk of developing a pathological fixation on their body, and this may increase the risk for the development of dysmorphic concern later in life (Boyda & Shevlin, 2011).

Unfortunately, not all studies reviewed specified the types of teasing that participants had experienced. In those studies where teasing was categorised, there appeared to be a particularly strong relationship between teasing aimed at physical aspects of an individual's appearance and their current body image. Studies conducted in the general population have found weight related teasing to be particularly elevated in samples of participants with eating disorders (Benas & Gibb, 2008). Given the current findings showing links between more general appearance related teasing and dysmorphic concern, one could hypothesise that such experiences during childhood and adolescence might lead to dysmorphic concerns. The idea that the risk for developing dysmorphic ideas about one's appearance is increased when an individual has experienced incidents during childhood which involved their appearance is in-keeping with current cognitive behavioural models of BDD (Veale, 2004). Moving beyond

traditional CBT models of BDD, Veale & Gilbert, (2014) propose that the attentional bias and repetitive behaviours seen in BDD serve the function of threat detection and monitoring in the presence of past aversive experiences involving rejection, humiliation and shame. They argue that if unprocessed, such memories have the ability to over sensitize one's ability to monitor their physical appearance and reinforce the value of appearance over competence (Veale & Gilbert, 2014).

The current review identifies preliminary evidence for childhood adversity as a risk factor for BDD however the studies identified vary considerably in quality and further exploration is required before meaningful conclusions can be drawn. In light of recent advances in the understanding of the impact of childhood abuse and trauma and growing evidence for a transdiagnostic approach to mental distress (Bullis et al., 2015), research should strive to develop models of trauma impact which both enable the identification of pathways between experience and distress, and acknowledge the possibility that many types of trauma and adversity are generic risk factors for mental distress in general.

Limitations of studies reviewed

Despite the relatively consistent findings reported throughout the review, all studies identified rely on participants' retrospective recall of events during their childhood, which may be subject to retrospective bias. Watson & Clark (1984) suggest that negative affectivity, a personality trait associated with a tendency to magnify mistakes, frustrations, disappointments and threat may influence the recall of childhood events thus making it difficult to draw firm conclusions about the consequences of childhood adversity such as abuse, given its subjective nature. It is also difficult to ascertain whether the experiences reported by participants happened as reported, or whether cognitive distortions cause them to

interpret innocent communications negatively, leading to feelings of victimisation. Further, bullies may identify physical vulnerabilities in certain children which may compound existing sensitivity. These cause-effect relationships are complicated, but may in part be overcome by taking collateral information from relevant family members, case files or medical notes or developing prospective research designs.

The majority of the studies presented in this review are small, exploratory and cross sectional, making it difficult to infer causality or generalise findings. Longitudinal studies with large samples, which use validated means of collating data and seek to ascertain details regarding the temporal sequence of childhood adversity and BDD severity are required.

It is also important to consider that the BDD population is known to be reluctant to discuss concerns due to high levels of shame, and a preference for seeking medical over psychological intervention (Buhlmann, 2011). This considered, findings from consenting research participants, might fail to represent a true BDD population.

Limitations of review

Although the current review employed a rigorous systematic process to identify and select relevant research reports, only one reviewer was involved in the collection, data extraction, quality assessment and synthesis. This may therefore limit the reliability of the selection of studies and affect the interpretation of results.

The decision to include research from both clinical and non-clinical populations was based on a dimensional formulation of body image problems, of which a diagnosis of body dysmorphic disorder would be an extreme. Benefits of such an approach include access to a wider range of experiences than just those of clinical participants, which might encourage a

less stigmatising conceptualisation of experience by eradicating the language of disorder for a more normalising approach (e.g. Johns & Van Os, 2001). However, problems associated with comparing clinical samples with non-clinical samples include the inability to accurately compare constructs of dysmorphic concern across populations, especially for research purposes.

As noted, the majority of research in this area provides support for cognitive behavioural conceptualisations of BDD, though alternative theoretical perspectives should not be dismissed. For example, theorists in the area of body image propose that insecure interpersonal attachments may be related to insecurities about physical worth or acceptability (Cash, Thériault, & Annis, 2004). Although the author knows of no such research in the area of BDD, relevant studies may not have been identified in the current search protocol. Further, unpublished papers, university theses, and other non-peer reviewed reports and papers which were not available in the English language were excluded from the review, which meant that a small number of articles retrieved were not included. This may have resulted in relevant data being missed.

Clinical implications and future research

This review has several important clinical implications. Services working directly with children and adolescents should be armed with knowledge regarding the potential impact of CA particularly that teasing and bullying aimed at appearance over prolonged time periods may have a significantly harmful effects on the development of self-image. Where such instances are identified, early intervention such as targeting unhelpful appearance related beliefs may best prevent dysmorphic concerns developing. Given the known levels

shame and secrecy within BDD populations, services working with young people should seek to reduce stigma and raise awareness of the impact of CA.

Clinicians should routinely inquire about abuse as victims of childhood abuse are often reluctant to tell others, and clinicians frequently do not ask (Read et al., 2007). Engagement of reluctant individuals may be fostered by early discussions intended to normalise and destigmatise BDD symptoms in the context of childhood adversity. In some cases, specific trauma interventions may be indicated.

During psychological therapy itself, particular importance should be placed on the hypothesised development of beliefs about the self and others which may mediate the relationship between such experiences and dysmorphic concern (e.g. *I'm inferior; others can't be trusted*). Within a cognitive-behavioural model, such beliefs might be effectively addressed and treated using behavioural experiments or cognitive interventions designed to find evidence for and against such beliefs. Where psychological assessment reveals a history of adversity such as abuse or bullying, techniques such as imagery re-scripting might enable an individual to manage memories and associated distress more adaptively, using techniques that transform distressing mental images into more benign entities or new, positive images (Willson, Veale & Freeston, 2015).

Research exploring possible social and developmental risk factors for BDD is in its infancy. This review identifies preliminary evidence for the role of childhood adversity with a possible emphasis on sexual and emotional abuse and their impact on the development of dysmorphic concerns.

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Chapter 2

**Frequency of general and specific appearance-focused teasing in body dysmorphic
concerns ²**

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² Manuscript is intended for publication to Body Image, see appendix 18 for author guidelines

Abstract

Body dysmorphic disorder (BDD) is characterized by significant distress and preoccupation about imagined or slight defects in appearance. In support of cognitive-behavioural models, preliminary evidence suggests that prolonged adverse experiences during childhood such as bullying and teasing are associated with BDD. In particular, teasing focused on appearance has been implicated, yet there is little research exploring whether there is increased vulnerability when individuals are exposed to specific versus general appearance-focused teasing or whether frequency of teasing increases this risk. The current study examined the role of teasing aimed at specific physical features such as the nose, skin or teeth (specific) and teasing about appearance more generally (general) and their relationship to body dysmorphic concerns in a university sample ($n = 328$). Those who reported specific appearance teasing had a higher prevalence of BDD diagnosis and greater severity ratings on a measure of body dysmorphic concern, compared with those who either reported general appearance teasing or no teasing history. Hierarchical multiple regression analyses showed that frequency of teasing was positively related to body dysmorphic concerns for both specific and general appearance teasing groups. There was no interaction between type of teasing (specific/ general) and frequency of teasing for body dysmorphic concerns. Appearance teasing, general and specific, both increase risk for body dysmorphic concerns and BDD and this risk increases for both groups as frequency of appearance teasing increases. Clinical implications and directions for future research are discussed.

Keywords: Body dysmorphic disorder, dysmorphic concerns, appearance-focused teasing.

Frequency of General and Specific Appearance-focused Teasing in Body Dysmorphic Concerns

Body dysmorphic disorder (BDD) involves a distressing or impairing preoccupation with a slight or imagined abnormality in one's physical appearance (American Psychiatric Association [APA], 2013). The most common reported areas of concern are skin, hair, stomach, weight and teeth (Phillips et al., 2006). Although these 'defects' are commonly unnoticeable to others, individuals with BDD often spend several hours per day worrying about their appearance, and engage in time consuming, repetitive behaviours such as comparing, mirror checking, camouflaging, excessive grooming and reassurance seeking (Phillips et al., 2006).

BDD is associated with impairment across a range of occupational, social and clinical domains. Unemployment rates are reported to fall between 39% and 53% (Didie, Menard, Stern, & Phillips, 2008) and high numbers of those diagnosed with BDD report extreme social dysfunction, including being housebound (Phillips et al., 2006). Clinically, BDD is associated with high levels of comorbidity with other psychiatric disorders and heightened rates of hospitalisation (Phillips et al., 2006) and suicide attempts (Phillips, 2007).

Prevalence in the general population is approximately 1.8% (Buhlmann et al., 2010), and rates in both clinical and student populations are much higher at 13% (Biby, 1998; Grant, Kim, & Crow, 2001) suggesting BDD is a relatively common diagnosis, especially given that such estimates may be conservative, with BDD often under or misdiagnosed (Buhlmann, 2011). There may be several explanations for this including individuals with BDD being more likely to present for help from dermatologists, dentists or cosmetic services, and high levels of shame

associated with appearance concerns (Buhlmann, 2011). BDD is under-researched relative to other disorders of similar prevalence (Feusner, Neziroglu, Wilhelm, Mancusi, & Bohon, 2010).

Central components of BDD include an over focus on appearance, negative appraisals of body image and rumination (e.g. Neziroglu, Khemlani-Patel, & Veale, 2008). Various risk factors have been proposed and range from genetic predisposition, shyness, perfectionism, and an anxious temperament, to a history of dermatological or other physical stigmata (Veale, 2004). Recently, research has emphasized a role for childhood adversity such as abuse and neglect (Buhlmann, Marques, & Wilhelm, 2012; Didie et al., 2006; Neziroglu, Khemlani-Patel, & Yaryura-Tobias, 2006) or teasing and bullying (Buhlmann, Cook, Fama, & Wilhelm, 2007; Buhlmann et al., 2011) providing preliminary evidence for the role of traumatic life experiences in the development of BDD. It is proposed that adverse social experiences in childhood such as teasing, bullying or other types of victimisation may lead to distorted processing of social and emotional input (Buhlmann & Wilhelm, 2004), causing distress which is maintained by safety and avoidance behaviours from within a cognitive behavioural (CBT) model (Neziroglu, Roberts, & Yaryura-Tobias, 2004). Such a pathway is consistent with early explorations of *appearance based rejection sensitivity*, defined as the tendency to anxiously expect, readily perceive and overreact to signs of rejection based on one's appearance (Park, 2007) as a mediator between appearance based victimisation and dysmorphic symptoms (Lavell, Zimmer-Gembeck, Farrell, & Webb, 2014).

The idea that early experience leads to emotional difficulties is not new and is applicable to many mental disorders. An emerging evidence base suggests that adverse childhood events are an important determinant of mental ill-health (Cuijpers et al., 2011). Teasing, verbal victimisation and emotional abuse may be a risk factor for the development of a range of

psychopathologies, including depression and social anxiety (Roth, Coles, & Heimberg, 2002; Storch, Brassard, & Masia-Warner, 2003) as well as negative body image generally (Gleason, Alexander, & Somers, 2000). Interestingly, research has found weight-related teasing to be related to later body image disturbances and a greater likelihood of eating disorder symptoms. Benas & Gibb (2008) propose specific mechanisms through which weight related teasing may increase an individual's risk to eating disorder symptoms. These findings suggest that there may be a specific relationship between being teased about weight, and developing a negative body image with concerns related directly to body size.

The limited research examining the relationship between teasing and BDD is so far in keeping with this hypothesis. Osman, Cooper, Hackmann, and Veale (2004) assessed spontaneous appearance related images in 18 participants with BDD and a mentally healthy control group. Participants were asked to recall a time when they felt worried or anxious about their appearance, and if at such times, they had ever experienced any spontaneous images. Those with BDD reported significantly more negative and recurrent distressing images from childhood such as being bullied or teased. It was proposed that these early experiences may contribute to distress later in life, providing a rationale for examining childhood experiences in the development of BDD more closely. To this end, Buhlmann et al. (2007) compared 16 individuals with BDD and 17 mentally healthy controls. On a measure of perceived childhood teasing, which differentiated appearance teasing from teasing related to competency, the BDD group reported significantly more of all types of teasing than controls. Importantly, frequency of appearance-focused teasing within the BDD group was positively related to BDD symptom severity, suggesting a specific role for teasing aimed at appearance over teasing more generally, while highlighting a significant role for frequency of teasing. Buhlmann et al. (2011) conducted similar

investigations in a population-based survey. Comparison of individuals with BDD and a matched sample from the general population revealed significantly more appearance-focused teasing reported by those with BDD. Furthermore, they reported more vivid recall of the teasing experiences and remembered them as more traumatic.

Dysmorphic concern, an over concern with a slight or imagined defect in appearance, is the main diagnostic criteria for BDD (APA, 2013) as such, research to date has tended to focus on dysmorphic concern as a manifestation of the disorder, rather than as a symptom (Oosthuizen, Lambert, & Castle, 1998). However, there are several benefits associated with examining the concept of dysmorphic concern as a symptom which occurs on a continuum of negative body image, at the extreme end of which lies BDD (Rosen & Ramirez, 1998). These include moving away from the stigmatising language of disorder towards a more normalising approach to mental health difficulties, and allowing the topic to be addressed from a broad generic base, rather than within the confines of diagnostic boundaries (Oosthuizen et al., 1998).

Aims and hypotheses

Understanding the possible risk factors for the development of BDD is essential for both identifying individuals at risk of developing BDD and clarifying the mechanisms and pathways through which individuals may be vulnerable to developing other types of psychopathology. It is accepted that teasing has an important role in the development of negative body image (Gleason et al., 2000). Studies have implicated weight based teasing in eating disorders (Benas & Gibb, 2008) and a growing evidence base supports a role for appearance-focused teasing in BDD, suggesting that the nature of teasing an individual experiences may be important in determining its effect on future functioning. The current study aims to extend this by examining whether

appearance-focused teasing which is aimed at specific bodily features such as the nose, skin or teeth has a stronger relationship with body dysmorphic concerns and BDD diagnosis than general appearance teasing, e.g. being teased for looking “*ugly*” or “*different*”. Furthermore, in light of evidence that frequency of teasing is related to severity of BDD, frequency of appearance teasing will also be an important factor to explore.

Given the high levels of body image concern reported, the study employed a sample of British university students and staff, and collected detailed information about teasing experiences recalled from childhood and current levels of body dysmorphic concern. Specifically it was hypothesized that:

- (1) Levels of dysmorphic concern would be higher in those who reported teasing about their appearance than those who did not.
- (2) Levels of dysmorphic concern would be higher in those who reported teasing to be focused on specific aspects of their appearance, compared to those who were teased about appearance more generally.
- (3) The frequency of appearance-focussed teasing would predict dysmorphic concern for both specific and general teasing groups, after controlling for several known predictors of BDD symptoms, including current levels of social anxiety, depression, self-esteem and perfectionism (Bartsch, 2007).
- (4) Type of teasing (i.e. specific or general) might moderate the relationship between frequency of teasing and BDD symptoms, in that specific appearance teasing may show a stronger positive relationship between frequency of teasing and body dysmorphic concerns, compared to general appearance teasing.

Method

Participants

Participants were students and staff members from two large Universities in the Northwest of England. Inclusion criteria were i) age 18 or over and ii) an ability to read and write fluently in English, which were assumed based on University status. In an attempt to collect information directly related to dysmorphic concern, participants who indicated presence of symptoms specifically associated with an eating disorder (anorexia or bulimia nervosa) were excluded from the study.

A total of 498 participants accessed the study. Four failed to provide their full informed consent, 58 met study criteria for an eating disorder, so were excluded from continuing and directed to a debrief page. A further 108 participants failed to reach the end of the survey, so in accordance with study protocol, their data was removed from further analyses, leaving 328 complete responses.

Of this sample, 254 (77%) were female, and age ranged from 18 – 74 ($M_{\text{age}} = 24.68$, $SD = 8.91$). The majority were of White British origin (238, 73%) and a large proportion described themselves as single (223, 68%). Most participants were recruited from Liverpool University (263, 80%) and the remaining from The University of Manchester (37, 11%). The largest proportion of the sample were current undergraduates (213, 66%), while a further 94 (29%) were postgraduate students or staff (16, 5%).

Measures

Measures were administered in the order they are presented. Full copies of each measure can be found in appendices 3-12.

Eating Disorder Symptoms: The SCOFF (Morgan, Reid, & Lacey, 1999; appendix 3) is a 5-question screening instrument assessing the core features of anorexia and bulimia nervosa. The measure provides a concise, valid, and reliable assessment when information is elicited in written format (Perry et al., 2002). Participants who answer ‘yes’ to two or more of the items are considered to be indicating presence of symptoms associated with Anorexia or Bulimia nervosa, so were thanked for their time, and directed to a debrief page.

Demographics: Eligible participants were asked to complete an optional demographic information sheet, requesting age, gender, level of education, relationship status and ethnicity. The decision to make this optional was made to allow participants optimal anonymity.

DSM-5 criteria: Participants answered questions assessing current DSM-5 criteria for BDD to provide an indication of prevalence in the sample. These questions followed the format described in Buhlmann et al. (2010), however one additional criterion (criterion B) was added to account for changes in the diagnostic criteria in DSM-5 (APA, 2013; appendix 4).

Teasing history: The Perception of Teasing Scale (POTS; Thompson, Cattarin, Fowler, & Fisher, 1995) is an 11 item self-report scale, which assess an individual’s history of teasing experiences. An original version of the scale comprised two subscales: weight teasing, and competency teasing. For the purpose of the current study, an adapted version (Buhlmann et al., 2007) used modified wording on the weight related scale, to assess frequency of appearance teasing (ATF) generally. This was the subscale of interest in the current study (ATF; appendix

5). The subscale includes six questions related to appearance teasing (e.g., “*people made fun of you because of your appearance*”, “*people made jokes about you being unattractive*”), rated on a 5-point Likert scale where one indicates ‘never’ and five indicates ‘very often’. Scores are summed, yielding a subscale total ranging from 6 – 30, where higher scores represent a greater frequency of appearance-focused teasing. Thompson et al. (1995) report good internal consistency for this subscale. In the present sample, ATF also showed strong internal consistency ($\alpha = 0.86$).

Assessment of specific/ general appearance teasing: Participants were asked if they recalled being teased about specific aspects of their physical appearance. If they answered yes, they were asked to provide further details (see appendix 6).

Social anxiety: The Social Interaction Anxiety Scale (SIAS; Mattick & Clarke, 1998; appendix 7) is a 21-item scale measuring anxiety experienced in social situations such as when initiating or maintaining conversations with strangers. Respondents are required to consider how much the statements describe them and provide a rating from 1 (not at all) to 5 (extremely). A summed total provides an overall social anxiety rating from 0 to 84. Several studies have provided evidence for the sound psychometric properties of the SIAS (e.g. Brown et al., 1997; Mattick & Clarke, 1998). Internal consistency for the present sample was $\alpha = 0.94$.

Depression: The Patient Health Questionnaire-9 (Spitzer, Kroenke, & Williams, 1999; appendix 8) is a self-administered version of the PRIME-MD diagnostic instrument for common mental disorders which assesses self-rated depression symptoms and establishes an overall rating of mood. Scores range from 0 – 28 where a higher score indicates worse mood. The PHQ-9 is a

widely used measure of self-reported depressed mood with excellent reliability and validity (Kroenke, Spitzer, & Williams, 2001). Internal consistency in the current sample was $\alpha = 0.87$.

Self-esteem: The Rosenberg Self Esteem Scale (RSES; Rosenberg, 1965, appendix 9) measures an individual's overall self-esteem, defined as “*a favourable or unfavourable attitude towards the self*” using 10 items scored on a 4-point Likert scale. Higher overall scores indicate positive self-esteem. The RSES is reported to be a valid and reliable measure of self-esteem (Andrews, Robinson, & Wrightsman, 1991). Cronbach's alpha in the present study was $\alpha = 0.92$.

Perfectionism: Self-oriented (SO-P) and socially prescribed perfectionism (SP-P) were measured by subscales on the Multi-Dimensional Perfectionism Scale (MPS; Hewitt & Flett, 1989, appendix 10). These subscales contain 15 items each and items are measured on a 5-point scale. For both scales, higher scores indicate higher levels of perfectionism. Satisfactory reliability and validity data are reported (Hewitt, Flett, Turnbull-Donovan, & Mikail, 1991). In the present study, cronbach's alpha was $\alpha = 0.93$ for SO-P and $\alpha = 0.87$ for SP-P.

Body dysmorphic concern: The Dysmorphic Concern Questionnaire (DCQ; Jorgensen, Castle, Roberts, & Groth-Marnat, 2001; Oosthuizen et al., 1998; appendix 11) consists of seven appearance related questions, scored on a 4-point Likert scale. Higher scores indicate greater dysmorphic concern. The measure is validated in both clinical and non-clinical samples (Jorgensen et al., 2001). A DCQ cut-off of 9 has been found to distinguish clinical BDD in 90.06% undergraduate students (Mancuso, Knoesen, & Castle, 2010). Cronbach's alpha in the current study was $\alpha = 0.90$.

Further information about dysmorphic concern: Finally, participants who indicated a presence of dysmorphic concern were asked to provide brief information regarding the focus of these concerns (e.g. face, arms, skin). See appendix 12.

Procedure

The study protocol was approved by the Institute of Psychology Health and Society Ethical Committee, University of Liverpool. Questionnaires were administered via an anonymous online survey, using select survey.net (ClassApps, 2014). Staff and students at the two universities were alerted to the study by emails sent through university announcement systems or advertisements on the university websites. Prior to completing the study, participants were provided with an electronic Participant Information Sheet (appendix 13) and informed consent was taken electronically (appendix 14). The survey took approximately 20 minutes to complete, and in return for their time, respondents who completed were entered into an optional prize draw for a chance to win high street vouchers.

Statistical analysis

All data were examined using SPSS v22. The sample was grouped by teasing status into i) those who reported no teasing; ii) those who were teased about their general appearance and iii) those who were teased about a specific physical feature. Bonferroni-corrected one-way ANOVAS were used to explore differences in the mean scores on all study measures according to teasing group. Effect sizes were calculated using Eta squared (η^2), according to Cohen's (1988) guidelines for small ($\eta^2 = 0.01$), medium ($\eta^2 = 0.06$), and large ($\eta^2 = 0.14$) effects. Next, the no teasing group was removed from analysis and correlations were conducted between all study measures for the remaining sample of teased individuals ($n = 279$). Hierarchical multiple regression was run separately for the general and specific appearance teased groups to examine

the role of frequency of teasing on dysmorphic concern, controlling for other variables. Finally a moderated multiple regression was employed using the Process macro (Hayes, 2012), to explore the moderating effect of type of teasing, i.e. specific and general on the relationship between frequency of appearance teasing and dysmorphic concern.

A series of power analyses (G*Power3; Faul, Erdfelder, Lang, & Buchner, 2007) indicated that the sample size was sufficient for all statistical procedures performed (see appendix 15).

Results

Preliminary analysis

The online survey format meant that participants were unable to miss questions; therefore there were no missing data. Prior to conducting the primary analysis, data were checked for assumptions of normality (see appendix 16). Distributions approximated normality with all scales showing acceptable skewness and kurtosis (i.e. between -1.0 to 1.0), apart from the PHQ-9, which showed a skewness value of 1.01. A box plot was used to identify outliers, and ANOVA was run both with the full sample and with the univariate outliers removed. This made no significant difference to findings, so the full sample was retained.

Prior to conducting the hierarchical multiple regression, multicollinearity was assessed in several ways including inspection of the correlation matrix, attention to the average variance inflation factor (Bowerman & O'Connell, 1990) and examination of tolerance statistics (Menard, 1995). Casewise diagnostics were checked to identify bias in the models, which resulted in the removal of one case from regression model 1. Finally, Cook's distance and Mahalanobis distance were examined, identifying no further cases for removal (appendix 17).

Descriptive statistics

Table 1 presents characteristics of the full sample grouped by teasing category. For those who reported a specific focus to the appearance teasing they experienced, the body part of focus is reported. The most common focus for teasing was general body build, followed by hair, and mouth, lips or teeth. Fifteen (5%) participants answered positively to all DSM-5 related questions indicating presence of body dysmorphic disorder. The largest proportion of participants meeting DSM-5 criteria (73%) belonged to the group who reported a specific focus to the teasing they experienced during childhood, compared with 7% in the no teasing group,

and 20% in the non-specific teasing group, although these groups were too small to conduct inferential tests. Of this group, five participants (33%) reported consistency between the body part recalled as the primary focus for teasing and the body part disclosed as the primary focus of concern (skin, breast/chest or hair).

Two hundred and eighty eight participants (88%) disclosed some level of current concern for a physical feature. The three most common primary concerns were general weight or build (76; 23%), stomach/ waist (37; 11%) and skin (28; 9%).

Table 1: Summary of age, gender, focus of specific appearance teasing and DSM-5 diagnosis by teasing status.

		Total sample (<i>N</i> = 328)		No teasing (<i>n</i> = 49)		Non-specific appearance teasing (<i>n</i> = 108)		Specific appearance teasing (<i>n</i> = 171)		
Age years	<i>M (SD)</i>	22.63	(8.00)	22.63	(8.00)	23.81	(7.90)	25.82	(9.63)	
Gender										
	Female	<i>n (%)</i>	254	(77%)	31	(66%)	84	(78%)	139	(83%)
	Male	<i>n (%)</i>	68	(21%)	16	(34%)	24	(22%)	28	(17%)
Focus of teasing: <i>n (%)</i>										
	General weight/build		-	-	-	-	-	56	(32.7%)	
	Hair		-	-	-	-	-	30	(17.5%)	
	Mouth/lips/teeth		-	-	-	-	-	12	(7.0%)	
	Skin		-	-	-	-	-	10	(5.8%)	
	Face/head		-	-	-	-	-	10	(5.8%)	
	Nose		-	-	-	-	-	7	(4.1%)	
	Eyes/eyebrows		-	-	-	-	-	7	(4.1%)	
	Stomach/waist		-	-	-	-	-	6	(3.5%)	
	Leg/knees/thighs		-	-	-	-	-	6	(3.5%)	
	Hips/buttocks		-	-	-	-	-	5	(2.9%)	
	Breast/chest		-	-	-	-	-	5	(2.9%)	
	Ethnic features		-	-	-	-	-	3	(1.8%)	
	Ears		-	-	-	-	-	1	(0.6%)	
	Arms/hands/fingers		-	-	-	-	-	1	(0.6%)	
	Other							11	(6.4%)	
DSM-5 criteria met:			15/328	(4.57%)	1/49	(2.04%)	3/108	(2.77%)	11/171	(6.43%)
		<i>n (%)</i>								

Table 2: Means, standard deviations and between groups one-way ANOVA for study variables by teasing status.

Variables	No teasing (n = 49)		Non-specific appearance teasing (n = 108)		Specific appearance teasing (n = 171)		F	Sig
	M	SD	M	SD	M	SD		
DCQ	4.90	4.66	7.33 ^a	4.91	9.78 ^{b c}	4.73	22.80	.000*
RSES	20.96	6.00	18.22 ^a	5.94	16.78 ^b	6.01	9.52	.000*
SIAS	21.63	14.16	30.94 ^a	15.78	30.42 ^b	15.87	6.96	.001*
PHQ-9	5.92	5.63	7.07	5.47	7.99	5.83	2.77	.064
SP-P	64.14	17.73	68.03	17.76	69.32	18.80	1.53	.219
SO-P	50.73	14.77	55.48	14.13	57.43 ^b	15.39	3.89	.021
ATF	-	-	10.96 ^a	3.99	14.82 ^{b c}	5.21	114.21 ^w	.000*

Note: DCQ = Dysmorphic Concerns Questionnaire; RSES = Rosenberg Self Esteem Questionnaire; SIAS = Social Interaction Anxiety Scale; PHQ-9 = Patient Health Questionnaire – 9; SP-P = Socially Prescribed Perfectionism; SO-P = Self-oriented Perfectionism; ATF = Appearance Teasing Frequency. The significance level was set to $p < 0.007$ with a Bonferroni correction for multiple comparisons, $0.05/7$; * $p < 0.007$. ^a = significant difference between no teasing and non-specific appearance teasing at $p < 0.05$; ^b = significant difference between no teasing and specific appearance teasing $p < 0.05$; and ^c = significant difference between non-specific appearance teasing and specific appearance teasing $p < 0.05$. ^w = Welch's *F* reported where Levine's test revealed that the assumption of homogeneity of variance was violated.

ANOVAS

In order to explore in which ways these three groups differed, a series of Bonferroni-corrected one way ANOVAs were conducted to compare participants' responses on the main study measures, revealing significant differences between teasing sub groups on several study measures. Importantly, there was a significant difference between scores on the Dysmorphic Concerns Questionnaire $F(2, 325) = 22.80, p < 0.001$, showing a large effect ($\eta^2=0.12$).

Evaluation of multiple comparisons using the Tukey HSD test revealed significant pairwise differences between all three conditions, with those in the specific teasing condition showing the highest levels of dysmorphic concern. Between group differences were also found for social anxiety $F(2, 325) = 6.96, p < 0.001$ ($\eta^2=0.04$); self-esteem, $F(2, 325) = 9.52, p < 0.001$ ($\eta^2=0.06$) and appearance-focused teasing $F(2, 325) = 57.34, p < 0.0001$ ($\eta^2=0.26$).

Multiple comparisons showed that those in the specific teasing condition demonstrated significantly higher levels of social anxiety and appearance teasing, and lower self-esteem. No significant differences were found in depression scores or for self or socially oriented perfectionism.

Table 3: Pearson's correlations between DCQ and other study variables in teased participants ($n = 279$).

Variables	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7
1. DCQ	8.84	4.94	-	-.57**	.36**	.51**	.15*	.36**	.41**
2. RSES	17.34	6.02		-	-.58**	-.62**	-.12	-.44**	-.35**
3. SIAS	30.62	15.80			-	.48**	.15*	.42**	.34**
4. PHQ-9	7.63	5.70				-	.19**	.47**	.27**
5. SO-P	68.82	18.38					-	.41**	.12*
6. SP-P	56.68	14.92						-	.30**
7. ATF	13.33	5.12							-

Note: DCQ = Dysmorphic Concerns Questionnaire; RSES = Rosenberg Self Esteem Questionnaire; SIAS = Social Interaction Anxiety Scale; PHQ-9 = Patient Health Questionnaire – 9; SP-P = Socially Prescribed Perfectionism; SO-P = Self-oriented Perfectionism; ATF = Appearance Teasing Frequency.
* $p < 0.05$, ** $p < 0.01$.

Correlations

Correlations between study variables were then examined. Participants who reported no teasing were removed from the subsequent analysis. It can be seen from Table 3 that the majority of study measures were significantly correlated. Observed linear associations were all in the expected directions. Dysmorphic concern was significantly associated with higher levels of depression, social anxiety, self and socially prescribed perfectionism and lower levels of self-esteem. Importantly, there was a moderate, significant relationship between the frequency of appearance-focused teasing and level of dysmorphic concern ($r = .41, N = 279, p < .01, \text{two-tailed}$).

Table 4: Hierarchical multiple regression predicting DCQ for the specific appearance teasing group and general appearance teasing group, showing the final models for unstandardised (*B*) and standardised beta (*β*) coefficients and ΔR^2 for each step.

Variables	Non-specific appearance teasing: Model 1 (n = 107)				Specific appearance teasing: Model 2 (n = 171)			
	<i>B</i>	<i>SE</i>	<i>β</i>	ΔR^2	<i>B</i>	<i>SE</i>	<i>β</i>	ΔR^2
Step 1				.32***				.26***
SIAS	-0.02	0.03	-.07		-0.01	0.02	-.04	
PHQ9	0.27	0.09	.24*		0.17	0.07	.21*	
Step 2				.10***				.08***
RSES	-0.34	0.08	-.42***		-0.27	0.07	-.34***	
SP-P	-0.01	0.03	-.02		0.03	0.02	.10	
Step 3				.05**				.02*
ATF	0.30	0.10	.25**		0.13	0.06	.15*	
Total R^2				.46***				.36***

Note: DCQ = Dysmorphic Concerns Questionnaire; RSES = Rosenberg Self Esteem Questionnaire; SIAS = Social Interaction Anxiety Scale; PHQ-9 = Patient Health Questionnaire – 9; SP-P = Socially Prescribed Perfectionism; ATF = Appearance Teasing Frequency; * $p < 0.05$, ** $p < 0.01$ *** $p < 0.001$

Hierarchical regression

To explore the extent to which frequency of appearance teasing, predicted dysmorphic concerns for both specific and general teasing groups, while controlling for the contributions made by other relevant variables, two hierarchical multiple regression analyses were conducted. The relationship between self-oriented perfectionism (SO-P) and DCQ was weak ($r = .15$, $N = 279$, $p < .01$, two-tailed), so it was removed from the regression analyses.

For the general appearance teasing group, (Model 1) current levels of anxiety and depression were controlled for by entering SIAS and PHQ-9 at step 1. Next, those variables measuring trait type characteristics that may also account for DCQ, including esteem scores (RSES) and socially prescribed perfectionism (SP-P) were entered at step 2. Finally, frequency of appearance-focused teasing (ATF) was added in step 3 in order to determine the specific amount of variance for which it accounted. The final model for the general appearance teasing group accounted for 46% variance in scores of dysmorphic concern, $R^2 = .46$, $F(5, 101) = 17.34$, $p < 0.0001$. For this group, even when social anxiety, depression, self-esteem and socially prescribed perfectionism were controlled for, frequency of appearance teasing (ATF) contributed significantly to DCQ scores, explaining an additional 5% variance, $\beta = .25$, $p = 0.003$.

For the specific teasing group (Model 2), the above procedure was replicated. The final model accounted for 36% in DCQ scores, $R^2 = .36$, $F(5, 165) = 18.44$, $p < 0.0001$. After controlling for anxiety and depression at step 1, and self-esteem and socially prescribed perfectionism at step 2, the frequency of appearance teasing contributed 2% variance in the final model $\beta = .15$, $p = 0.032$.

Moderated Multiple Regression

Although each regression analysis indicates that ATF is significantly related to DCQ for both general and specific teasing, it was also predicted that there may be an interaction between type of teasing (general or specific) and level of frequency of appearance teasing for DCQ scores. It was predicted that specific teasing would show a stronger positive relationship between frequency of appearance teasing and DCQ and that general teasing would be positive but less so. This prediction stipulates that teasing group will moderate the relationship between frequency of appearance teasing and DCQ. To test for this DCQ was regressed on ATF with teasing status (specific/ general) included as a moderator. Once again, social anxiety, depression, self-esteem and socially prescribed perfectionism were included as covariates. As expected, the moderated multiple regression showed a direct relationship between ATF and DCQ: $R^2 = 0.43$, $F(7, 270) = 29.62$, $p < 0.001$. However, the interaction term was not significant $R^2 = 0.01$, $F(1, 270) = 2.45$, $p < 0.12$. At lower levels of teasing frequency, specific appearance teasing has a greater impact on DCQ compared to general appearance teasing, however as frequency of teasing increases, both groups increase and converge to have a similar but increased impact on DCQ.

Discussion

The purpose of this study was to explore the relationship between appearance teasing and body dysmorphic concern in a British university sample, and for the first time in this area, examine the impact of teasing aimed at specific features of appearance compared with appearance teasing more generally. The hypothesis that those who reported teasing in childhood would show increased levels of dysmorphic concern compared with those who were not teased was supported. This finding is consistent with earlier non clinical investigations (Jackson, Dowling, Honigman, Francis, & Kalus, 2012) and studies with BDD participants (Buhlmann et al., 2007; Buhlmann et al., 2011) and supports clinical (Neziroglu et al., 2004) and conceptual (Feusner et al., 2010) models of BDD.

Further, the study found that of the participants who reported a history of teasing, those who recalled a specific focus to the teasing had significantly higher ratings on measures of dysmorphic concern than those who reported a more general appearance teasing history. Importantly, the mean score for the group who reported a specific focus to teasing fell above the clinical cut-off for BDD according to the dysmorphic concerns questionnaire (Mancuso et al., 2010). Further, for the group who indicated presence of BDD according to DSM-5 criteria, there was consistency between the body part which was the focus of teasing, and the body part currently causing concern. An association between frequency of appearance teasing and severity of dysmorphic concern has been observed (Buhlmann et al., 2007), but this was an exploration of the quality of appearance teasing, suggesting there may be an important role for specificity in teasing in BDD. For example, individuals might interpret specific teasing as evidence that they are flawed in some way “*being teased about my skin suggests that there is something wrong with my skin*”.

However, it is notable that the study found frequency of appearance teasing to predict dysmorphic concern regardless of whether a participant identifies a specific focus to their appearance teasing experiences or not, when rates of current pathology were controlled. This suggests that specificity might be an important, albeit not necessary factor in the relationship between appearance teasing and body dysmorphic concern. The clinical levels of dysmorphic concern observed in the specific teasing group, may highlight an important role for specificity of teasing, however, in the absence of a clinical comparison group, it is difficult to say that this relationship is exclusive to BDD. Markedly, a recent study examining the role of appearance based teasing as a risk factor for BDD in a comparable sample found a significantly stronger relationship between appearance teasing and BDD symptoms than teasing and self-reported OCD symptoms (Weingarden & Renshaw, 2015). Taken together, these findings contribute further evidence that appearance teasing may be a specific risk factor for BDD. Individuals who are repeatedly teased about their appearance may be led to overvalue the importance of appearance and interpret these experiences as validation of such, which manifests in dysmorphic concern related to any body part. Such an explanation is in keeping with compassionate mind conceptualizations of BDD (Veale & Gilbert, 2014) which posit that the attentional biases and repetitive behaviors of BDD serve an evolutionary function in relation to threat detection (in which distorted body image is the threat) in light of past aversive experiences.

Clinical Implications

The study supports current CBT conceptualizations of BDD and reinforces the importance of addressing perceived teasing experiences when formulating a client's difficulties, as memories of such incidents, especially where they were frequent, are likely to have contributed to beliefs. The findings may inform intervention by implicating the use of imagery

re-scripting techniques which aim to change aversive memories and make the outcome less distressing (Willson, Veale & Freeston, 2015).

The results also indicate a key role for education and prevention programs targeted at children of pre-adolescence and adolescence, as this is known to be a crucial stage in the formation of body image (Lunde, Frisén, & Hwang, 2007) and as such an optimum time to support the development of coping skills which might minimize the effects of teasing. Further, initiatives to reduce bullying of all types, with a specific emphasis on appearance-focused teasing may have a profound impact on emotional wellbeing and the formation of dysmorphic concern in the general population and clinical BDD. The finding that childhood adversity may increase risk for dysmorphic concern in the general population is in keeping with a continuum conceptualisation of body image and BDD (Rosen & Ramirez, 1998). Given the low levels of help seeking by individuals with BDD (Buhlmann, 2011) there may be an argument for “high risk” groups to be identified in settings considered less stigmatising than mental health services, for example, primary care, cosmetic surgery and education settings prior to BDD reaching clinical levels.

There was a 5% BDD prevalence rate in the sample according to DSM-5 criteria which falls between general population estimates (Buhlmann et al., 2010) and previous reports from student samples (Biby, 1998). Respondents reported general weight or build, stomach/ waist or skin to be their primary concern. This is in keeping with studies looking at the clinical features of BDD (Phillips et al., 2006). These findings suggest that sample is in some ways representative of both general and BDD populations.

However, several limitations should be considered. The sample employed were a largely non-clinical, student sample which was predominantly made up of women. This makes it difficult to generalize findings to BDD samples, or men. Notably, because the study did not identify or exclude individuals with diagnosed BDD, or those actively engaged in treatment, it is neither possible to draw firm conclusions to a non-clinical population. Future studies might usefully control for such variation. Further, 85% reported a history of teasing, a much higher rate than the 30% bullying prevalence reported elsewhere (Nansel et al., 2001). While this difference may appear large, it should be noted that the concepts of 'teasing' and 'bullying' are different and cannot be directly compared, although it is likely that those attracted to the survey represented a group with greater levels of concerns about their appearance than the general population.

The study is cross-sectional and relies upon retrospective, self-reported accounts of teasing, which itself is a subjective construct. Those who are sensitive about their appearance might be likely to misinterpret memories or selectively recall experiences from their childhood which others would not consider as incidents of teasing (Buhlmann et al., 2007). It is also possible that children with sensitivities about their physical appearance are more vulnerable to bullying, which serves to compound appearance worries. Future studies should determine the temporal sequencing of events, and employ prospective designs in order to improve the ability to infer causality. Issues with recall bias may also be overcome by using clinically administered measures of teasing, or collecting collateral information from families or schools. Studies in clinical populations are also warranted. It should also be noted that prevalence of BDD in the sample was made using self-report responses to diagnostic criteria with no supporting validity or reliability data. Further, excluding participants indicating presence of eating disorder may have resulted in an underestimation of prevalence.

Notwithstanding these limitations, the study extends the current literature examining risk factors for BDD. Teasing about appearance, both specific and general is likely to be a contributing factor to developing body dysmorphic concerns, and children who are bullied or teased about their appearance may be at increased risk of developing pathological discontent with their physical appearance. Future research should seek to explore the impact of early teasing on body dysmorphic symptoms in large, clinical samples where individuals with diagnosed BDD are compared with clinical controls such as those with diagnosed obsessive compulsive disorder to assess the extent to which the impact of childhood teasing is specific to BDD, or whether it constitutes a more generic risk factor for psychological distress.

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Appendix 1: Quality assessment tool

(Adapted from the Critical Appraisal Skills Programme tool for case control studies)

1. ARE THE RESULTS OF THE STUDY VALID?**a) Does the study address a clearly focused issue?**

A question can be focused in terms of:

- the population studied
- the risk factors studied

b) Do the authors use an appropriate method to answer their question?

Consider:

- Is a case control study/ cross-sectional study an appropriate way of answering the question under the circumstances?

c) Were participants (and controls) recruited in an acceptable way and are they representative of the target population?

We are looking for selection bias which might compromise validity of the findings:

- Were cases (and controls) defined precisely?
- Were cases (and controls) representative of a defined population (geographically and/or temporally)?
- Is there an established reliable system for selecting cases (and controls)?
- Is there something special about the cases (and controls)?
- Is the time frame of the study relevant to exposure?

d) Is the sample size adequate and does it have sufficient statistical power for the study objectives?**e) Have confounding factors / limitations been reported and considered in the design?****2. WHAT ARE THE RESULTS?****a) Are results accurately measured and reported and not biased?**

We are looking for measurement, recall or classification bias:

- Was BDD accurately measured using valid and reliable tools?
- Were early events accurately measured using valid and reliable tools?

How precise and believable are the results? Consider:

- Size of the P-value; size of the confidence intervals. Have the authors considered all the important variables? How was the effect of subjects refusing to participate evaluated?

3. WILL THE FINDINGS HELP LOCALLY?

a) Does the study have ecological validity?

Consider:

- Genetic, environmental and socio-economic factors

Scoring criteria

Individual criterion to be rated:

- 0 = Missing/ not addressed
- 1 = Limited information
- 2 = Adequately addressed
- 3 = Clearly addressed/ rigorous design

Overall total rating per study:

- 0 - 7 = Poor
- 8 - 14 = Limited
- 15 - 18 = Adequate
- 19 - 21 = Excellent

Appendix 2: Quality assessment ratings

	Boyda & Shevlin, 2011	Buhlmann et al., 2007	Buhlmann et al., 2012	Buhlmann et al., 2011	Didie et al., 2006	Jackson et al., 2012	Lavell et al., 2014	Neziroglu et al., 2006	Semiz et al., 2008	Wolke & Sapouna, 2008
Is the study valid?										
a) Focused issue	3	3	3	3	3	3	3	3	2	3
b) Appropriate methods	2	2	2	2	2	2	2	2	2	2
c) Participants	1	2	2	3	2	1	2	1	1	1
d) Sample size	1	1	1	2	2	2	2	0	0	0
e) Limitations	1	2	2	2	2	2	2	2	1	1
What are results?										
a) Accurate?	2	2	2	2	2	2	2	1	1	2
Will findings help?										
a) Ecologically valid?	1	2	2	2	2	1	2	1	1	1
Total score	11 Limited	14 Limited	14 Limited	16 Adequate	15 Adequate	13 Limited	15 Adequate	10 Limited	8 Limited	10 Limited

Appendix 3: The SCOFF Eating disorders screening tool

1. Do you make yourself sick because you feel uncomfortably full?
2. Do you worry you have lost control over how much you eat?
3. Have you recently lost more than one stone in a 3-month period?
4. Do you believe yourself to be fat when others say you are too thin?
5. Would you say that food dominates your life?

Appendix 4: DSM-5 BDD criteria

DSM-5 inclusion rules	Description of DSM-5 criteria	Item
Agreement to criterion A	Preoccupation with an imagined defect in appearance. If a slight physical anomaly is present, the persons concern is markedly excessive.	<i>Do you think you have one or more disfiguring defects in your appearance, although people do not share your opinion or believe your concern to be markedly exaggerated? Do you think about your appearance concern for at least one hour a day?</i>
Agreement to criterion B	Presence of repetitive behaviours or mental acts in response to appearance concerns	<i>Have you ever engaged in repetitive behaviours (such as mirror checking, excessive grooming, skin picking or reassurance seeking) or mental acts (such as comparing your appearance to others) in response to your concerns?</i>
Either agreement to criterion C1	The preoccupation causes significant distress	<i>If yes, is this defect very distressing to you?</i>
Or agreement to criterion C2	Or impairment in social, occupational, or other important areas of functioning	<i>Do the worries about your physical defect cause significant impairment in your everyday life (e.g., in your job or social life)?</i>
Disagreement to criterion D	The preoccupation is not better accounted for by another mental disorder (e.g., dissatisfaction with body shape and size in anorexia nervosa)	<i>a. Are you primarily concerned about being thin enough or becoming too fat? b. In the last 3 months, have you often restrained from eating for 24 hours or longer? c. In the last 3 months, have you often made yourself vomit after eating something? d. In the last 3 months, have you often taken more than twice the recommended amount of diuretics?</i>

Appendix 5: The Perception of Teasing Scale (POTS), appearance teasing frequency (ATF) subscale

We are interested in whether you have been teased and how this affected you. The following questions should be answered with respect to the period of time when you were growing up (ages 5-16).

For each question rate *how often* you think you were teased using the scale below:

Never 1	2	Sometimes 3	4	Very often 5
------------	---	----------------	---	-----------------

1. People made fun of you because of your appearance.

1 2 3 4 5

2. People made jokes about you being unattractive.

1 2 3 4 5

3. People laughed at you for trying out for sports because you were not athletic.

1 2 3 4 5

4. People called you names like “ugly”.

1 2 3 4 5

5. People pointed at you because of your appearance.

1 2 3 4 5

6. People sniggered about your appearance when you walked into a room alone.

1 2 3 4 5

Appendix 6: Assessment of specific/ general appearance teasing

If you identified any teasing experiences, was teasing aimed at specific aspects of your physical appearance?

Yes **No**

If yes, what was the primary aspect of your physical appearance that you were teased about?

(OPTIONS: General weight/ muscle build, feet, genitals, legs/knees/thighs/ankles, hips/buttocks, breasts/chest, stomach/waist, arms/hands/fingers, ethnic features, skin, neck/shoulders, ears, chin/jaw, mouth/lips/teeth, nose, eyes/eyebrows, forehead, face/head (general), hair)

Appendix 7: The Social Interaction Anxiety Scale (SIAS)

Instructions: For each item, please circle the number to indicate the degree to which you feel the statement is characteristic or true for you. The rating scale is as follows:

0 = **Not at all** characteristic or true of me, 1 = **Slightly** characteristic or true of me,
 2 = **Moderately** characteristic or true of me, 3 = **Very** characteristic or true of me,
 4 = **Extremely** characteristic or true of me.

- | | |
|--|-----------|
| 1. I get nervous if I have to speak with someone in authority (e.g. teacher, boss) | 0 1 2 3 4 |
| 2. I have difficulty making eye contact with others. | 0 1 2 3 4 |
| 3. I become tense if I have to talk about myself or my feelings. | 0 1 2 3 4 |
| 4. I find it difficult to mix comfortably with the people I work with. | 0 1 2 3 4 |
| 5. I find it easy to make friends my own age. | 0 1 2 3 4 |
| 6. I tense up if I meet an acquaintance in the street. | 0 1 2 3 4 |
| 7. When mixing socially, I am uncomfortable. | 0 1 2 3 4 |
| 8. I feel tense if I am alone with just one other person. | 0 1 2 3 4 |
| 9. I am at ease meeting people at parties, etc. | 0 1 2 3 4 |
| 10. I have difficulty talking with other people. | 0 1 2 3 4 |
| 11. I find it easy to think of things to talk about. | 0 1 2 3 4 |
| 12. I worry about expressing myself in case I appear awkward. | 0 1 2 3 4 |
| 13. I find it difficult to disagree with another's point of view. | 0 1 2 3 4 |
| 14. I have difficulty talking to attractive persons of the opposite sex. | 0 1 2 3 4 |
| 15. I find myself worrying that I won't know what to say in social situations. | 0 1 2 3 4 |
| 16. I am nervous mixing with people I don't know well. | 0 1 2 3 4 |
| 17. I feel I'll say something embarrassing when talking. | 0 1 2 3 4 |
| 18. When mixing in a group, I find myself worrying I will be ignored. | 0 1 2 3 4 |
| 19. I am tense mixing in a group. | 0 1 2 3 4 |
| 20. I am unsure whether to greet someone I know only slightly. | 0 1 2 3 4 |

Appendix 8: The Patient Health Questionnaire-9 (PHQ-9)

Using the following key:

- 0 Not at all
 1 Several days
 2 More than half the days
 3 Nearly every day

Over the *last 2 weeks*, how often have you been bothered by any of the following problems?

- | | | | | |
|--|--------------------------|--------------------------|---------|--------------------------|
| a. Little interest or pleasure in doing things | <input type="checkbox"/> | <input type="checkbox"/> | 0 1 2 3 | <input type="checkbox"/> |
| b. Feeling down, depressed, or hopeless. | <input type="checkbox"/> | <input type="checkbox"/> | 0 1 2 3 | <input type="checkbox"/> |
| c. Trouble falling/staying asleep, sleeping too much. | <input type="checkbox"/> | <input type="checkbox"/> | 0 1 2 3 | <input type="checkbox"/> |
| d. Feeling tired or having little energy. | <input type="checkbox"/> | <input type="checkbox"/> | 0 1 2 3 | <input type="checkbox"/> |
| e. Poor appetite or overeating. | <input type="checkbox"/> | <input type="checkbox"/> | 0 1 2 3 | <input type="checkbox"/> |
| f. Feeling bad about yourself – or that you are a failure or have let yourself or your family down. | <input type="checkbox"/> | <input type="checkbox"/> | 0 1 2 3 | <input type="checkbox"/> |
| g. Trouble concentrating on things, such as reading the newspaper or watching television. | <input type="checkbox"/> | <input type="checkbox"/> | 0 1 2 3 | <input type="checkbox"/> |
| h. 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. | <input type="checkbox"/> | <input type="checkbox"/> | 0 1 2 3 | <input type="checkbox"/> |
| i. Thoughts that you would be better off dead or of hurting yourself in some way. | <input type="checkbox"/> | <input type="checkbox"/> | 0 1 2 3 | <input type="checkbox"/> |

If you checked off any problem on this questionnaire so far, how difficult have these problems made it for you to do your work, take care of things at home, or get along with other people?

Not difficult at all Somewhat difficult Very difficult Extremely difficult

Appendix 9: The Rosenberg Self Esteem Scale (RSES)

Instructions: Below is a list of statements dealing with your general feelings about yourself. If you strongly agree, circle **1**. If you agree with the statement, circle **2**. If you disagree, circle **3**. If you strongly disagree, circle **4**.

1.	On the whole, I am satisfied with myself.	1	2	3	4
2.*	At times, I think I am no good at all.	1	2	3	4
3.	I feel that I have a number of good qualities.	1	2	3	4
4.	I am able to do things as well as most other people.	1	2	3	4
5.*	I feel I do not have much to be proud of.	1	2	3	4
6.*	I certainly feel useless at times.	1	2	3	4
7.	I feel that I'm a person of worth, at least on an equal plane with others.	1	2	3	4
8.*	I wish I could have more respect for myself.	1	2	3	4
9.*	All in all, I am inclined to feel that I am a failure.	1	2	3	4
10.	I take a positive attitude toward myself.	1	2	3	4

*= reverse score

Appendix 10: The Multi-Dimensional Perfectionism sub scales

Self-oriented (SO-P) and socially prescribed (SP-P) perfectionism subscales

Listed below are a number of statements concerning personal characteristics and traits. Read each item and decide whether you agree or disagree and to what extent. If you strongly agree, circle 7. If you strongly disagree, circle 1. If you feel somewhere in between, circle one of the numbers between 1 and 7. If you feel neutral or undecided, the midpoint is 4.

- (SO-P) When I am working on something, I cannot relax until it is perfect
- (SP-P) I find it difficult to meet others' expectations of me
- (SO-P) One of my goals is to be perfect in everything I do
- (SO-P) I never aim for perfection in my work
- (SP-P) Those around me readily accept that I can make mistakes too
- (SP-P) The better I do, the better I am expected to do
- (SO-P) I seldom feel the need to be perfect
- (SP-P) Anything I do that is less than excellent will be seen as poor work by those around me
- (SO-P) I strive to be as perfect as I can be
- (SO-P) It is very important that I am perfect in everything I attempt
- (SO-P) I strive to be the best at everything I do
- (SP-P) The people around me expect me to succeed at everything I do
- (SO-P) I demand nothing less than perfection of myself
- (SP-P) Others will like me even if I don't excel at everything
- (SO-P) It makes me uneasy to see an error in my work
- (SP-P) Success means that I must work even harder to please others
- (SO-P) I am perfectionistic in setting my goals
- (SP-P) Others think I am okay, even when I do not succeed
- (SP-P) I feel that people are too demanding of me
- (SO-P) I must work to my full potential at all times
- (SP-P) Although they may not show it, other people get very upset with me when I slip up
- (SO-P) I do not have to be the best at whatever I am doing
- (SP-P) My family expects me to be perfect
- (SO-P) I do not have very high goals for myself
- (SP-P) My parents rarely expected me to excel in all aspects of my life
- (SP-P) People expect nothing less than perfection from me
- (SO-P) I set very high standards for myself
- (SP-P) People expect more from me than I am capable of giving
- (SO-P) I must always be successful at school or work
- (SP-P) People around me think I am still competent even if I make a mistake

Appendix 11: The Dysmorphic Concern Questionnaire (DCQ)

Have you ever....

been very concerned about some aspect of your physical appearance

Not at all	Same as most People	More than most people	Much more than most people
------------	------------------------	--------------------------	-------------------------------

considered yourself misformed or misshapen in some way (e.g. nose/ hair/ skin/ sexual organs/ overall body build)

Not at all	Same as most People	More than most people	Much more than most people
------------	------------------------	--------------------------	-------------------------------

considered your body to be malfunctional in some way (e.g. excessive body odour, flatulence, sweating)

Not at all	Same as most People	More than most people	Much more than most people
------------	------------------------	--------------------------	-------------------------------

consulted or felt you needed to consult a plastic surgeon/ dermatologist/ physician about these concerns

Not at all	Same as most People	More than most people	Much more than most people
------------	------------------------	--------------------------	-------------------------------

been told by others that you are normal in spite of you strongly believing that something is wrong with your appearance or bodily functioning

Not at all	Same as most People	More than most people	Much more than most people
------------	------------------------	--------------------------	-------------------------------

spent a lot of time worrying about a defect in your appearance or bodily functioning

Not at all	Same as most People	More than most people	Much more than most people
------------	------------------------	--------------------------	-------------------------------

spent a lot of time covering up defects in your appearance/ bodily functioning

Not at all	Same as most People	More than most people	Much more than most people
------------	------------------------	--------------------------	-------------------------------

Appendix 12: Further information regarding body concerns

If you have identified body concerns in the above questions, please indicate your area of **primary** concern:

(OPTIONS: General weight/ muscle build, feet, genitals, legs/knees/thighs/ankles, hips/buttocks, breasts/chest, stomach/waist, arms/hands/fingers, ethnic features, skin, neck/shoulders, ears, chin/jaw, mouth/lips/teeth, nose, eyes/eyebrows, forehead, face/head (general), hair)

Please indicate any other prominent body concerns below:

Appendix 13: Participant Information Sheet



Participant Information Sheet

Childhood Experiences and Self-Image

You are invited to take part in an online questionnaire study. Please read the following information carefully before deciding if you would like to participate. If you would like more information or have any questions please contact us using the details provided below. The following information will briefly explain why the research is being done and what it will involve.

What is the purpose of the study?

Previous research has suggested there may be a link between negative experiences during childhood, and problems such as depression, social anxiety, and eating disorders.

This study aims to explore some specific childhood experiences, which may be involved in the development of positive and negative self-image. Some people who take part in this study may have a more or less positive self-image than others. Everyone's experiences are important.

Am I eligible to take part?

In order to participate we ask that you are over 18 and able to read written instruction in English.

To ensure that the results of this study can be generalised to a maximum number of people, we ask that individuals with a diagnosed eating disorder or anyone with current significant difficulties relating to eating or food do not take part in this research.

You do not need to assess this yourself, as you will be guided through a series of questions at the beginning of the study which will determine whether or not you should continue.

Please note, being excluded from the study on this basis does not mean that you have an eating disorder. This could only be determined by a mental health professional and your GP. However, if you wish to discuss any concerns raised by these questions, please refer to the guidance at the end of this Information Sheet for further advice and information.

Do I have to take part?

Your participation in this research is voluntary and you are free to withdraw from the study at any time without explanation or consequence.

What will happen if I take part?

You will be asked to complete a set of online questionnaires by selecting responses from a list, including some questions about your body image. You will also be asked about certain

experiences you may remember from your childhood. It is up to you how much information you provide.

The study should take between 20 – 30 minutes to complete.

When you have completed the survey, your data will be added to an anonymous database. You will not be contacted again and this will mark the end of your participation in the study.

Are there any risks in taking part?

There are no direct risks to taking part in the study. However, some of the questions ask about potentially emotional issues, such as negative experiences from childhood and current body confidence. If any of the questions upset or affect you in any way we refer you to several services which may be able to offer support. These are listed at the end of this information sheet, and are repeated at the end of the study.

Are there any benefits in taking part?

There will be no immediate direct benefits to you. However it is expected that increased knowledge about the development of self-image may benefit others in the future.

What if I am unhappy or if there is a problem?

Please contact Dr James Reilly on 0151 7945877 (jreilly@liverpool.ac.uk) or Nancy Black (nancy.black@liverpool.ac.uk) and we will try to help. Should you remain unhappy or wish to make a complaint which you feel cannot be made directly to us then please contact the Research Governance Officer for the University of Liverpool on 0151 794 8290 (ethics@liverpool.ac.uk) providing details of the name or description of the study, the researcher involved and the details of the complaint you wish to make.

Will my participation be kept confidential?

Any information you give will be made anonymous and will not be personally identifiable. You will be provided with a study participant number should you wish to withdraw from the study at a later date. Your responses will only be viewed by the researchers involved in the study. Any data you provide will be stored in accordance with the data protection act for seven years and will then be destroyed.

Will my taking part be covered by an insurance scheme?

Any participants who take part in the study which is approved by the University of Liverpool ethics committee will have cover.

What will happen to the results of the study?

The results from the study will be written up as part of a Doctoral Degree in Clinical Psychology. It is expected that the findings will be published in an academic journal at a later date.

What will happen if I want to stop taking part?

You can withdraw from the study at any time should you change your mind without giving a reason why. All you need to do is contact the researchers stating your 'study participant number' and that you wish to withdraw from the study, and your data will be deleted.

Who can I contact if I have further questions?

Dr James Reilly on 0151 7945877 (jreilly@liverpool.ac.uk)

Clinical Psychology Department
University of Liverpool
The Whelan Building
Brownlow Hill
Liverpool
L69 3GB
United Kingdom

If you would like to be entered into a prize lottery to win a £50 Amazon Voucher as a thank you for taking part, please enter your email address or contact telephone number when requested to do so.

If you have been upset or distressed by any of the questions asked and you feel you need to talk to someone about this, we advise that you either talk to someone you trust or you contact your GP.

If you need to speak to someone urgently, you could call:

NHS Direct: 0845 46 47 (24 hours)

Anxiety UK: 0844 4775774 (Mon – Fri)

Mind Infoline: 0300 1233393 (Mon – Fri)

Alternatively, you can access support through your University Counselling Service:

Liverpool University Students:

The University Counselling Service
14 Oxford Street
Liverpool
L69 7WX
0151 794 3304
counserv@liverpool.ac.uk

Manchester University Students:

University of Manchester Counselling Service
5th Floor, Crawford House
Precinct Centre
Booth Street East
Manchester
M13 9QS
0161 275 2864
counsel.service@manchester.ac.uk

Appendix 14: Participant consent form**Title of Research:** Childhood Experiences and Self-Image**Please complete this page if you wish to take part in the study**

1. I confirm that I have read and have understood the information page for the above study. I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily.
 Yes No

2. I understand that my participation is voluntary and that I am free to withdraw at any time without giving any reason, and without my rights being affected.
 Yes No

3. I understand that, under the Data Protection Act, I can at any time ask for access to the information I provide and I can also request the destruction of that information if I wish.
 Yes No

4. I agree to take part in the above study
 Yes No

Please make sure you have answered 'Yes' to all the questions above if you wish to take part. Any 'No' responses and your data will not be included in this research.

The contact details of Principal Investigator are:

James Reilly: 01517945483
jreilly@liverpool.ac.uk

The study will now begin on the following pages, thank you for consenting to take part

Appendix 15: Power calculations

A series of power analyses were conducted prior to data collection using G*Power3 (Faul, Erdfelder, Lang, & Buchner, 2007)

One-way ANOVA: based on an effect size of 0.25, α value of 0.05, 95% power and 3 groups, it was calculated that a sample of 252 was required.

Correlations: based on an effect size of 0.3, α value of 0.05 and 95% power it was calculated that a sample of 138 was required.

Hierarchical multiple regression: based on an effect size of 0.32 reported (Menzel et al., 2010), with a α value of 0.05 and 95% power, incorporating 1 tested predictor and 6 covariates, it was calculated that a sample of 43 was required.

Moderated multiple regression: In the absence of data regarding the possible moderating effects of specificity in the relationship between appearance teasing and dysmorphic concern, a power calculation was not possible. According to (Aiken & West, 1991), for statistical power of .80, to detect interaction in regression using $\alpha = 0.05$, based on the most conservative estimations of variance explained (where R^2 for main effects only = 0.05 and R^2 for main effects with an interaction = 0.10) the minimum sample size required is 143 (Aiken & West, 1991).

References

- Aiken, L. S., & West, S. G. (1991). *Multiple regression: Testing and interpreting interactions*. Sage.
- Faul, F., Erdfelder, E., Lang, A., & Buchner, A. (2007). G* power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior Research Methods, 39*(2), 175-191.
- Menzel, J. E., Schaefer, L. M., Burke, N. L., Mayhew, L. L., Brannick, M. T., & Thompson, J. K. (2010). Appearance-related teasing, body dissatisfaction, and disordered eating: A meta-analysis. *Body Image, 7*(4), 261-270.

Appendix 16: Normality data

Distribution data for study variables

Variables	Skewness	SE	Kurtosis	SE
1. DCQ	0.44	0.14	-0.62	0.27
2. RSES	0.04	0.14	-0.51	0.27
3. SIAS	0.39	0.14	-0.70	0.27
4. PHQ-9	1.01	0.14	0.66	0.27
5. SO-P	-0.27	0.14	-0.27	0.27
6. SP-P	0.32	0.14	-0.19	0.27
7. ATF	0.83	0.14	-0.04	0.27

Appendix 17: Assessing multicollinearity and bias

Multicollinearity was assessed in a number of ways. Initially, the correlation matrix for each model was inspected for correlations higher than $r < .90$ (Field, 2013). All variables across both models were significantly correlated. For Model 1, the strongest correlation was between social anxiety (SIAS) and self-esteem (RSES), $r = -0.63$, $N = 107$, $p < .0001$, and for Model 2, the strongest correlation was between current depressed mood (PHQ-9) and self-esteem (RSES), $r = -0.63$, $N = 171$, $p < .0001$.

Next, variance inflation factor (VIF) values were all checked, and were found to be below 10. The average (VIF) was calculated by summing the VIF value for each predictor and dividing by the total number of predictors in each model separately (Field, 2013). These values were calculated as 1.65 and 1.58 for Model 1 and Model 2 respectively, and this value was not substantially greater than 1 (Bowerman & O'Connell, 1990; Menard, 1995). Tolerance statistics were examined for values below 0.2 (Menard, 1995), confirming that collinearity was not a problem in either model.

Bias in the models was checked by examining case wise diagnostics for extreme cases. Outliers were defined as cases with a standardized residual greater than 3. In Model 1, 1 outlier was removed from the model, as it was shown to have an undue influence. No cases were removed from Model 2. Cases were further checked for a Cook's distance greater than 1 and Mahalanobis distance value greater than 20.52 based on 5 predictors and $p = .001$. No further cases were removed.

References

- Bowerman, B. L., & O'Connell, R. T. (1990). *Linear statistical models: An applied approach*
PWS-Kent Boston.
- Field, A. P. (2013). *Discovering statistics using IBM SPSS statistics : (and sex and drugs and
rock 'n' roll)* Los Angeles ; Sage, 2013; 4th ed.
- Menard, S. (1995). *Applied logistic regression analysis: Sage university series on quantitative
applications in the social sciences.*

Appendix 18: Body Image journal guidelines (*reduced description*)

DESCRIPTION

Body Image is an international, peer-reviewed journal that publishes high-quality, scientific articles on **body image** and human **physical appearance**. Body image is a multi-faceted concept that refers to persons' perceptions and attitudes about their own body, particularly but not exclusively its appearance. The journal invites contributions from a broad range of disciplines – psychological science, other social and behavioral sciences, and medical and health sciences. The journal publishes original research articles, brief research reports, theoretical and review papers, and science-based practitioner reports of interest.

GUIDE FOR AUTHORS

Types of Papers

The journal publishes original research articles, brief research reports, theoretical and review papers, and science-based practitioner reports of interest. Dissertation abstracts are also published online, and the journal gives an annual award for the best doctoral dissertation in this field.

While regular-length papers have no explicit limits in terms of numbers of words, tables/figures, and references, authors are encouraged to keep their length below 35 total pages. A paper's length must be justified by its empirical strength and the significance of its contribution to the literature.

Preparation

Submitted papers must comply with the stylistic requirements of the *Publication Manual of the American Psychological Association* (6th Ed). The paper should have 1-inch margins all around and be double-spaced throughout.

Article structure

Introduction

State the objectives of the work and provide an adequate background, avoiding a detailed literature survey or a summary of the results.

Material and methods

Provide sufficient detail to allow the work to be reproduced. Methods already published should be indicated by a reference: only relevant modifications should be described.

Results

Results should be clear and concise, describing the findings and their associated statistical basis. Consider the use of tables and figures for statistical details.

Discussion

This section should present the theoretical, empirical, and applied implications of the results, not simply repeat the findings. The study's limitations should be explicitly recognized. A combined Results and Discussion section may be appropriate.