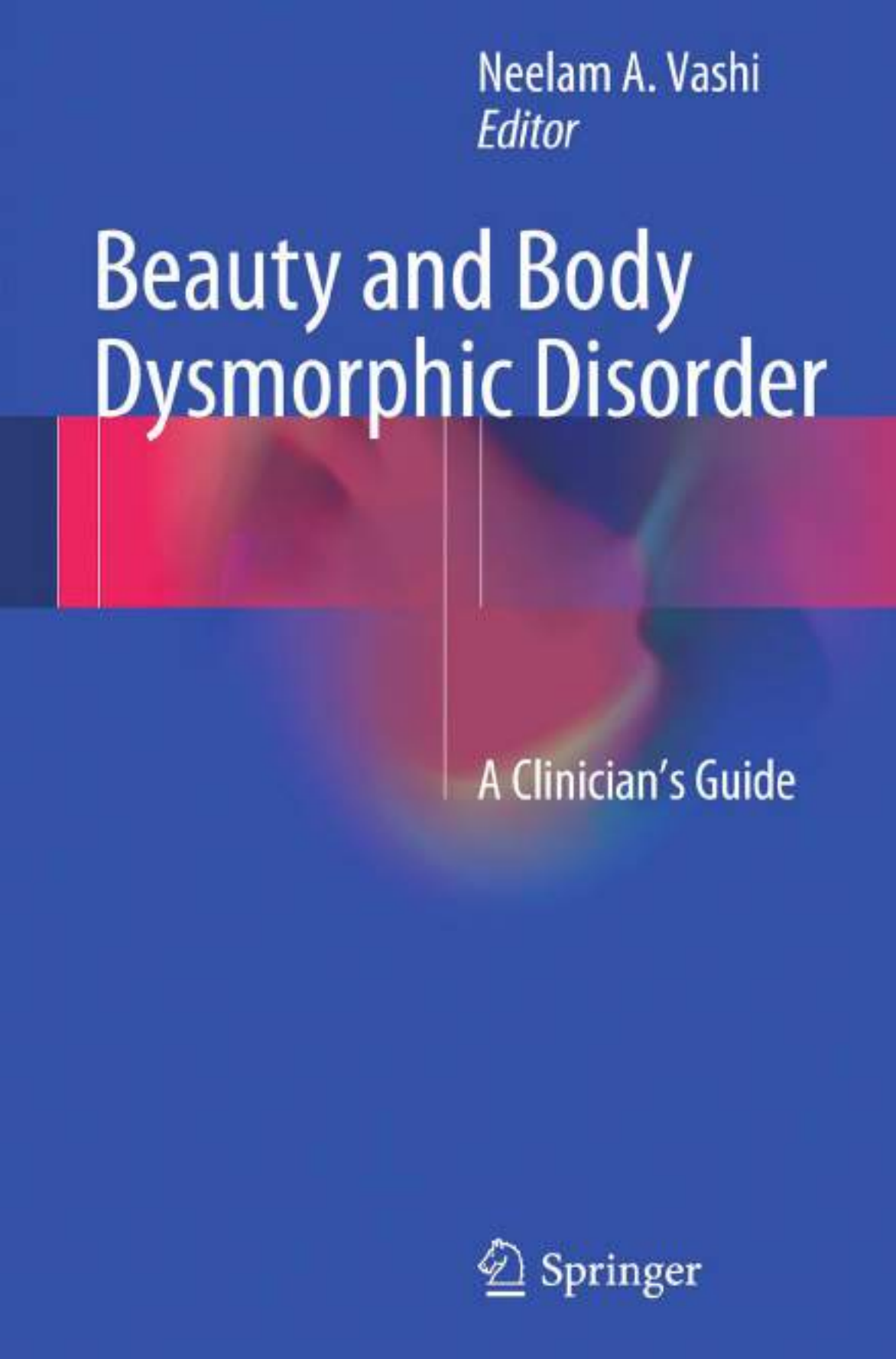
Neelam A. Vashi
Editor

Beauty and Body Dysmorphic Disorder

A Clinician's Guide



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To my wonderful parents, Ajit and Kaumudini, my two sisters and best friends, Roopal and Ronak, and especially to my loving husband, Eric, for supporting me each and every day. I love you all. And in loving memory of Ginnie Secemsky; my second mother, my confidant, my friend. I will miss you forever.

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Chapter 1
Historical Importance of Beauty

Neelam A. Vashi

The Beauty Background

We, as a society, have a deeply rooted obsession with beauty. From little girls trying on their mother's high heels to elderly women spending hours in salons dyeing and styling their hair, the indulgence to look and feel beautiful pervades all age groups and walks of society. This insurmountable fascination is illustrated by the 814,000,000 results on a Google search engine, where one can read about all the new advice, secrets, and tricks to look more beautiful. We even have whole magazine editions dedicated to show and exalt the most beautiful in society. Our fascination is not dumbfounded as it pays to be beautiful. Now a common household name and the highest paid supermodel in the world, Gisele Bundchen (Fig. 1.1) earned $ 42 million in 2013, even more than her equally famous football quarterback husband, Tom Brady, who made $ 38.3 million [1]. The ten highest paid supermodels in the world collectively brought home $ 82.8 million in 2013 [1]. In 2012, the median household income for the USA was $ 51,371, a pale comparison [2]. Although the average person makes far less than the most beautiful, the average will still pay to try and enhance his or her own attractiveness. Even during times of economic recession, when consumer spending typically declines, women's spending on beauty products—the so-called lipstick effect—appears to increase [3]. Interestingly, this is a phenomenon that occurs worldwide. The Kalahari Bushmen of Africa use animal fats as skin moisturizers even during times of famine [4, 5]. In modern day society, studies do show that faces with makeup are viewed as more attractive, feminine, and healthy [6]. The mass market has clearly picked up on our preoccupation with

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Fig. 1.1 Gisele Bundchen. Photograph courtesy of Tiago Chediak—Flickr. Licensed under CC BY 2.0 via wikimedia commons. (http://commons.wikimedia.org/wiki/File:Gisele_Bundchen2.jpg#mediaviewer/File:Gisele_Bundchen2.jpg)

looks and our willingness to spend on beauty enhancing products so that we are now constantly bombarded with images of physical perfection, magic potions for ageless skin, and instantaneous makeup tricks to potentially look gorgeous. Technology feeds into our hunger for beauty with the ability to morph average looks to beautiful (Fig. 1.2a), and enhance already innately gorgeous women (Fig. 1.2b). Studies show that the physical attractiveness of a human advertisement model is able to influence inanimate object evaluation, more so, if the product itself would serve the purpose of enhancing the customer's physical attractiveness [7, 8]. In 2012, the average American household spent $ 628 on personal care products and services [9]. In addition to money, we spend much time on beauty enhancing measures. The average American wife spends 44 min washing, dressing, and grooming, while the average American husband spends 32 min on a typical day [10]. Beauty endeavors hold steady over the ages, with single American women aged 70 and older spending 43 min grooming on a typical day [10]. The appeal of enhancing attraction appears to be quite commonplace; however, keeping it up clearly can be quite costly and time consuming.

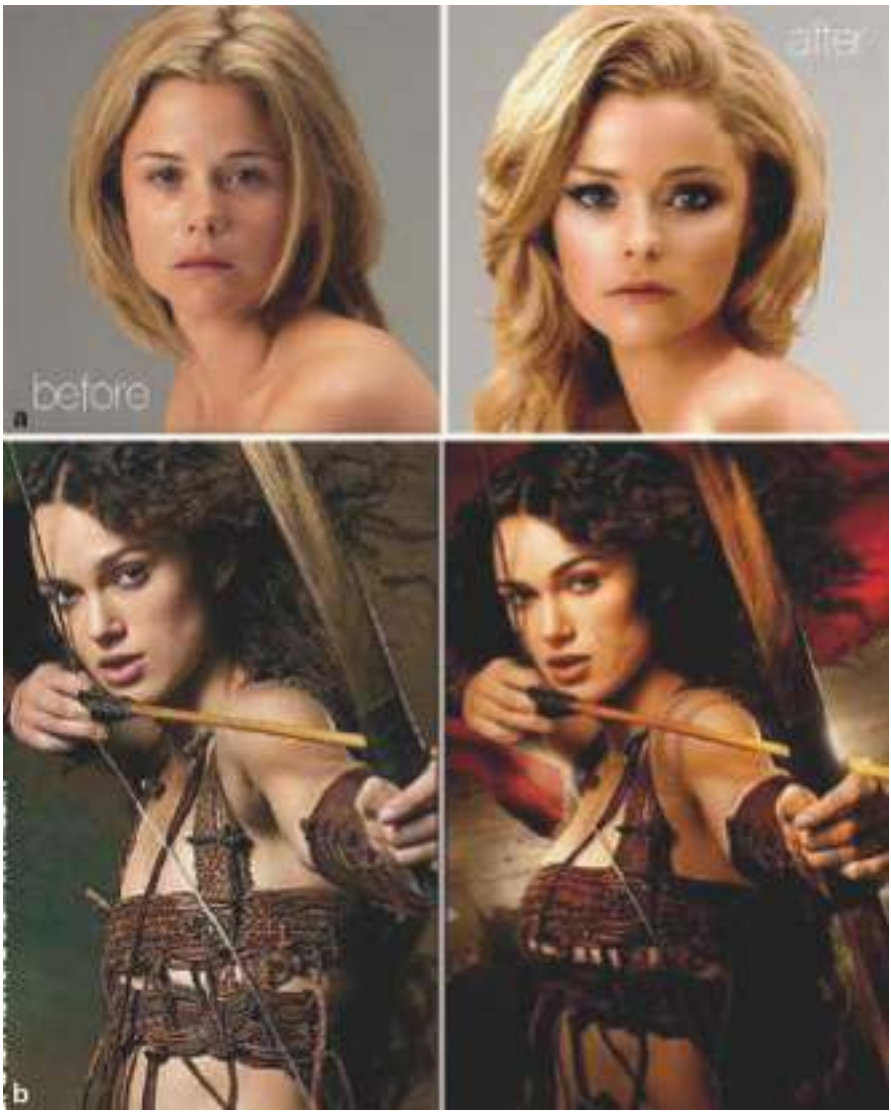

Fig. 1.2 **a** Body evolution—model before and after air brushing. **b** Keira Knightley before and after photoshop. (http://www.about-face.org/disclaimer-for-airbrushed-models-an-effective-solution/)

Kosmetikos

In the Greek myth of Narcissus, a very handsome hunter looks into the water and falls in love with his own reflection. He dies there alone, unable to look away from his own beauty. This was man's first mirror; the still water of a clear pool [11]. In Mesopotamia around 3500 BC came about the Bronze Age when polished metal

Fig. 1.3 Queen Nefertiti (1370–1330 BC) of ancient Egypt with thick black eye makeup. Photograph courtesy of "Nofretete Neues Museum" by Philip Pikart—Own work. Licensed under CC BY-SA 3.0 via wikimedia commons. (http://commons.wikimedia.org/wiki/File:Nofretete_Neues_Museum.jpg#mediaviewer/File:Nofretete_Neues_Museum.jpg)

became the preferred material for mirrors [11]. As soon as technology improved, silver was exchanged for bronze, with its more neutral color allowing for better reflection [11]. In today's age, we only have to turn a corner to see our own reflection in a smooth and unvarnished glass mirror. Seeing one's own reflection has spurred the desire to change, manipulate, conceal, and enhance our given looks; with American men and women spending billions of dollars every year on beauty enhancing measures.

The history of cosmetics spans almost every society on earth over a period of at least 6000 years of human life. The word cosmetics stems from the Greek *Kosmetikos*, meaning "skilled in decorating" [11]. Palettes for grinding and mixing face powder and eye paint, dating to 6000 BC, have been unearthed by archeologists, and by 4000 BC in ancient Egypt, the art of makeup application was widely practiced [11]. Eye makeup (Fig. 1.3) was an early development, with green being the preferred color. It was made from powdered malachite, a green copper ore, and applied to the upper and lower eyelids [11]. Kohl, a black paste, composed of powdered alimony, burnt almonds, black copper oxide, and brown clay ocher was added to make the eyeliner darker, and furthermore, ground beetle shells were added to produce glitter [12]. Another early development was skin creams, with the Romans using beeswax, olive oil, and rosewater to create a proper product [13]. Rouge and facial powder were also favorite types of makeup throughout history. Greek courtesans amplified rouge's redness by, first, coating their skin with white powder; these whitening powders contained large amounts of lead that would eventually result in premature deaths over the next 2000 years [11]. Queen Elizabeth I of England is well-known for her use of lead, creating a look known as the "Mask of Youth," wanting to be known as the "Virgin Queen." Arsenic complexion wafers were consumed in the eighteenth century in Europe, producing a white pallor through a state of induced anemia, again a poisonous way to whiten the skin [11].

Fig. 1.4 Silk beauty patches in different shapes. (http://fortieswardrobe.blogspot.com/2012/10/beauty-patches-anno-1948.html)

Studies, that are more recent, have shown that visible skin color distribution plays an important role in the perception of female attractiveness [14, 15]. Human beings are thought to have a preference for skin that conveys youth and health [16]. Recent research has demonstrated that males and females are sensitive to skin color variations, and such variations can affect the perception of attractiveness, age, and health; thus, promoting the design of makeup and cosmetic products able to provide more even skin color.

One of the earliest forms of cosmetics was actually beauty patches (Fig. 1.4), initially used to cover facial blemishes caused by smallpox scars in the 1600s [12]. These consisted of black silk or velvet pieces in shapes of hearts, stars, and/or moons to cover different parts of the face [12]. Patch boxes, considered the forerunner of the mirrored facial compact, were carried to hold replacements in case a patch were to fall off [11]. From these beauty patches came the advent of a theatrical product known as French White, which consisted of a dissolved white powder that was dried to produce a thin film to cover scars [17]. With the development of vaccinations, these facial ornaments moved from practicality to "cosmetic affection" [11], and soon we had the birth of modern day cosmetics.

Spearheaded by the French, the birth of the modern cosmetics industry came in the 1880s with the replacement of homemade cosmetics by store-bought, brand-name products: Guerlain, Chanel, Coty, Dior, Rubinstein, Arden, Revlon, Lauder, and Avon, to name a few [11]. Avon, an American company, first started in 1886 when a door-to-door salesman realized that there was more interest in the free introductory gift (a home-made perfume vial) than the books he was trying to sell [11]. He quickly abandoned books, and in 2014, Avon was again named as a top global beauty brand, ranking #2 in Brand Finance's "Top 50 Cosmetic Brands," second only to L'Oréal [18]. Today, cosmetics represent a vast category of innovative and complex formulations intended to cover, camouflage, and beautify. While cosmetics do not adhere to strict monographs governing their formulations nor do they

go through the Food and Drug Administration (FDA) approval process, there are regulations for the allowed preservative constituents and coloring agents, given the history of use of products tainted with caustic substances including mercury, lead, and arsenic [12]. With the Food, Drug, and Cosmetic Act of 1938 and the tremendous resources spent by large cosmetic manufacturers in searching, formulating, and designing products to maintain product safety and purity, today, cosmetics are safe [12]; and we as consumers purchase these products, spending billions of dollars each year in attempts to enhance our beauty.

What Is Beauty?

So what does this magnificent word *beauty* truly mean, and what are the implications for being beautiful? The Merriam-Webster dictionary defines beauty as "the quality or aggregate of qualities in a person or thing that gives pleasure to the senses or pleasurably exalts the mind or spirit" [19]. According to Wikipedia, a popular collaboratively edited free Internet encyclopedia, an "ideal beauty is an entity which is admired, or possesses features widely attributed to beauty in a particular culture, for perfection" [20]. Beauty has even been documented to transgress the physical, amounting to an experience, leading to emotional well-being and attraction [20]. Although there are personal preferences to beauty and standards that vary across cultures and time; within a society at any given point of time, there is substantial agreement to what constitutes human beauty [10]. As beauty is able to represent a standard of comparison, it can cause inequalities and dissatisfaction when not achieved. Our human fascination with beauty compounded with the inequalities it presents to society has caused multiple different disciplines to extensively study this topic. Economists, psychologists, sociologists, social psychologists, and anthropologists to name a few have spent years and made careers out of studying the concept of beauty and the ramifications it presents to society. To economists who study pulchronomics (the study of the economics of physical attractiveness), beauty is considered a scarce resource, with those deficient experiencing negative feelings and consequences [10].

Developed by researchers at the University of Michigan in 1971, the most widely used scale to study beauty uses a 5 to 1 rating scheme with special instructions on what rating choices mean [21].

5 Strikingly handsome or beautiful
4 Good-looking (above average for age and sex)
3 Average looks for age and sex
2 Quite plain (below average for age and sex)
1 Homely

Although individuals will always vary to some degree when rating others' attractiveness, there is a remarkable tendency to generally agree within categories with complete disagreement (e.g., the rating of someone as either a 5 or 1) about looks

Fig. 1.5 Beijing Olympic Games with girl on *left* lip-synching "Ode to the Motherland" to voice of girl on *top right*. (http://www.smh.com.au/news/off-the-field/silencing-the-star-in-red/2008/08/ 12/1218306898050.html)

being an extraordinarily rare event [10]. Even when accounting for different interactions and interviewers, there still remains the tendency to view interviewees' looks in, although not identical, quite similar ways [10]. With respect to ages, looks of younger people are overall generally rated more favorably than those of older people; however, photos taken of the same persons over time have been shown to get similar ratings, illustrating that a person's looks relative to those of others does not change greatly over the lifetime [10].

The importance of beauty holds true at all ages and also worldwide. Not deemed cute enough to sing on national television during the 2008 Summer Olympics, a cuter girl was ordered to lip-synch during the opening ceremony of the Beijing Olympic Games (Fig. 1.5) [10, 22, 23]. In other countries, not only matrimonial but also help-wanted advertisements mention a requirement for good looks and a nice appearance [10, 24]. Interestingly, although there is a worldwide importance of beauty and rating concurrence, there are overall cultural nuances. Americans in general (and men more so than woman) appear more able to give a "1" or "homely" rating, at least in studies compared to Canadians and the Chinese [10]. Regardless, there is overall worldwide agreement on the ability to stratify those into disparate categories of strikingly handsome or homely with subsequent societal implications.

The "Beauty Premium" and "Ugliness Penalty" [25]

The ability to categorize and quantify beauty has allowed research to show us that there are clear advantages to being physically attractive. In 1972, researchers first termed this phenomenon as "what is beautiful is good" to describe the human tendency to assume that attractive people possess positive attributes [26]. This phenomenon is robust with physically attractive people perceived as being happier and more successful than unattractive people. Desirable characteristics, such as social competence, intelligence, and likeability, have also been associated with beauty [27–30]. Good-looking people have been found to be less lonely, less socially anxious, more

popular, better and more persuasive communicators, and more sexually experienced than unattractive people [28, 31]. In the marriage market, although men's looks do not matter as much, women's looks are at a high premium. More attractive women are able to secure mates that are more intelligent, successful, and richer. In general, attractive people generally marry other attractive people, conferring beauty to the next generation [10, 32]. There is even an association between intelligence and attraction [33]. Buss speculates that if women generally prefer intelligent males because of presumably higher incomes and social status, and if most men prefer attractive women, then over time these two characteristics will tend to covary [34].

From a young age, a person's physical attractiveness is the most accessible attribute in social interactions and has the ability to create first impressions. It can even affect the attitudes that parents hold about their own infants; on measures of smartness, likeability, and "good baby," positive associations were related to ratings of attractiveness [35]. Mothers of more attractive infants were found to be more affectionate and playful compared to mothers of less attractive infants, these mothers being more attentive to other people rather than their own children [36]. Beautiful children have been rated as more intelligent with higher academic potentials compared to those who were less attractive [37]. In a large meta-analysis, physically attractive students were judged more favorably by teachers in a vast number of dimensions including intelligence, academic potential, grades, friendliness, and social skills [38]. Teachers even judge the parents of attractive children to care more about education and to set higher goals for their children [38]. This has ongoing implications with self-fulfilling prophecies as students may live up to the notions and expectations that others assume for them. When measured alone, increased physical attractiveness is positively correlated with a student's cumulative grade point average [39]. Students judge teachers in the same fashion; professors perceived as attractive receive higher student evaluations than do unattractive controls that are matched for department and gender, and students more likely want to be in the class of an attractive teacher, indicating that the good-looking teacher would be a more effective and nicer educator [40, 41]. Even preschoolers have been shown to often make judgments about unknown peers with the "beauty is good" stereotype, choosing attractive peers as potential friends [26, 42]. This transcends to older children as well, with attractiveness being positively correlated with popularity in adolescents [43]. This includes romantic popularity, with literature showing that physically attractive adolescents being more satisfied with their romantic life [44]. The shaping of future success in, both, the beginnings of family formation and the labor market appear to occur at a young age with beauty parameters being an important component with enduring effects.

In a simulated evaluation of job applicants, interviewers were found to prefer attractive over unattractive candidates [45]; and in a field experiment, attractive people received 36% more callbacks to submitted resumes compared to unattractive people along with quicker response times [46]. Attractive people are often employed in occupations with a high degree of public exposure like those in the television and film industry. Furthermore, in the movie industry, beauty is even further segregated; and on multiple dimensions, attractive characters are portrayed more favorably than unattractive characters [47].

Success at the workplace starts with acquiring jobs and progresses with subsequent salary accumulation and occupational prestige. Hamermesh and Biddle's seminal work show that while controlling for other variables, there lies a premium pay for good looks and even larger penalty to earnings for bad looks [25]. The bottom 15 % of women, by looks, received 4 % lower pay than average-looking women; the top one-third of women, by looks, received 8 % more than average-looking people [25]. Men can experience a similar fate with a 13 % penalty and 4 % premium. When placed into a framework looking at lifelong earnings, with an average 5–10 % gap, this leads to good-looking people earning about $ 230,000 more over the course of their life [10]. The most studied determinant of earnings in literature is education including years of schooling. Given that additional years of schooling raises income to different degrees, these numbers imply that men's good looks impact earnings with an equivalency to an increase of at least 1.5 years of education, and furthermore, potentially 5 years of work experience [10]. There are many reasons for this increase in pay. First, "good-looking" people tend to sort into jobs where appearance is more important to performance. Second, within occupations, there appears to be different salary potentials among attractive and unattractive persons. It has been shown that better-looking lawyers earned more after 5 years of practice, an effect that grew more with experience, and also gained earlier partnership, with a 1 standard deviation increase in attractiveness, thus, increasing the probability of early partnership by over 20 % [48]. In addition, it was found that attorneys in the private sector (where they have more customer contact) are generally better-looking than those in the public sector [48]. This impact of beauty on earnings appears independent of other factors like personality and self-esteem [10].

Studies have shown us that attractiveness, especially facial, does matter for both genders and its impact is stable over the entire employment history as individuals tend to maintain their relative position in the beauty distribution throughout their lifetime [49, 50]. Controlling for intelligence quotient (IQ), level of education, parent's education, and a range of other variables, facial attractiveness has been shown to be important in determining a person's occupational prestige at the beginning, in the middle, and at the end of his or her career [49]. In a large meta-analytic review, attractive individuals were found to fare better than unattractive individuals in terms of a number of job-related outcomes such as hiring, promotion, and performance evaluation [51]. Even after controlling for player performance, National Football League quarterbacks, who are more attractive are paid greater salaries through the conscious (or subconscious) recognition of these intangible traits [52]. It has even been shown that "exogenous increases" in attractiveness can raise electoral success for politicians [53]; and that good looks are preferred by voters in political elections [54].

The physical attractiveness phenomenon even generalizes to behavioral helping responses with attractive persons receiving more help than their unattractive counterparts [55]. Better-looking female solicitors are able to get more people to contribute to charitable causes [10]. In addition, service workers, with a high level of attractiveness opposed to low level, produce a higher level of customer satisfaction [56]. Moreover, attractiveness has been found to play an influential role in the persuasive impact of an explicit desire to influence others [57]. The practice already exists of managerial persons employing front-line persons with a high level of physical attractiveness [58]. Even in the market for loans, better-looking people

were more likely to get a loan with better terms even though they were as or more likely to default [59, 60].

Beauty is unequally distributed in society, and being unattractive can lead to adverse effects, such as lower self-esteem [61] and lower levels of satisfaction and intimacy in social interactions [62]. *Ugly Betty*, a television sitcom, depicts the hardships in the life of a girl judged to be unattractive. Being unattractive has been shown to increase the propensity to criminal behavior for a number of crimes, ranging from burglary to selling illicit drugs [59, 63]. Sparked by hearing a bank robber state that he was "too ugly to get a job," authors set out to see if a relationship existed between physical attractiveness and criminal propensities [59]. The authors attribute these effects to rational economic behaviors in that below average individuals face more obstacles in the labor market, having to resort to crimes for livelihood [63]. In addition, in both simulated and real judicial trials, the more attractive the defendant, the more likely to receive lenient punishment and less of an imposed sentence [64, 65].

Overwhelmingly, "beauty is good" is the most common finding in writings and texts; however, there is a small amount of literature that counters this theory with the "beauty is beastly" hypothesis [66]. Under certain circumstances, attractiveness may not be a positive attribute, and in some contexts, people respond negatively to attractive members of their own sex [67, 68]. For example, in a study of selection of scholarship applicants, participants advantaged highly attractive opposite-sex targets and discriminated against highly attractive same-sex targets, associating decisions with social opportunity and threat respectively [68]. Overall, however, there is little support for the "beauty is beastly" hypothesis, and "beauty is good" appears to be the dominating force. The beauty phenomenon is so prevalent than some economists have even suggested legal protection for the ugly, proposing affirmative action for the ugly and beauty taxes for the most attractive [10, 59].

Hamermesh's legendary work, creating the notion of the "beauty premium," has been thoroughly supported by subsequent research not only in labor economics but also in other aspects of life, with beauty being correlated with happiness, life satisfaction, group and family formation/dissolution, and social competence [69, 70]. One can clearly see that we as a society prefer to buy from better-looking sales people, listen to more handsome lawyers, be led by prettier politicians, and learn from more beautiful professors.

Importance to the Clinician

Society enables the most attractive to trade beauty to raise standards of living, improve interpersonal relations, and partake in more enjoyable workplaces [10]. The sad truth is that in our worldwide society, being beautiful makes other people like you more. Physically beautiful persons are consistently judged to be qualitatively superior, with associated traits of enhanced mental acuity, moral goodness, and interpersonal skills [4]. There is powerful evidence that attractiveness not only affects opinions of others but also permeates actions towards others [29]. An understanding

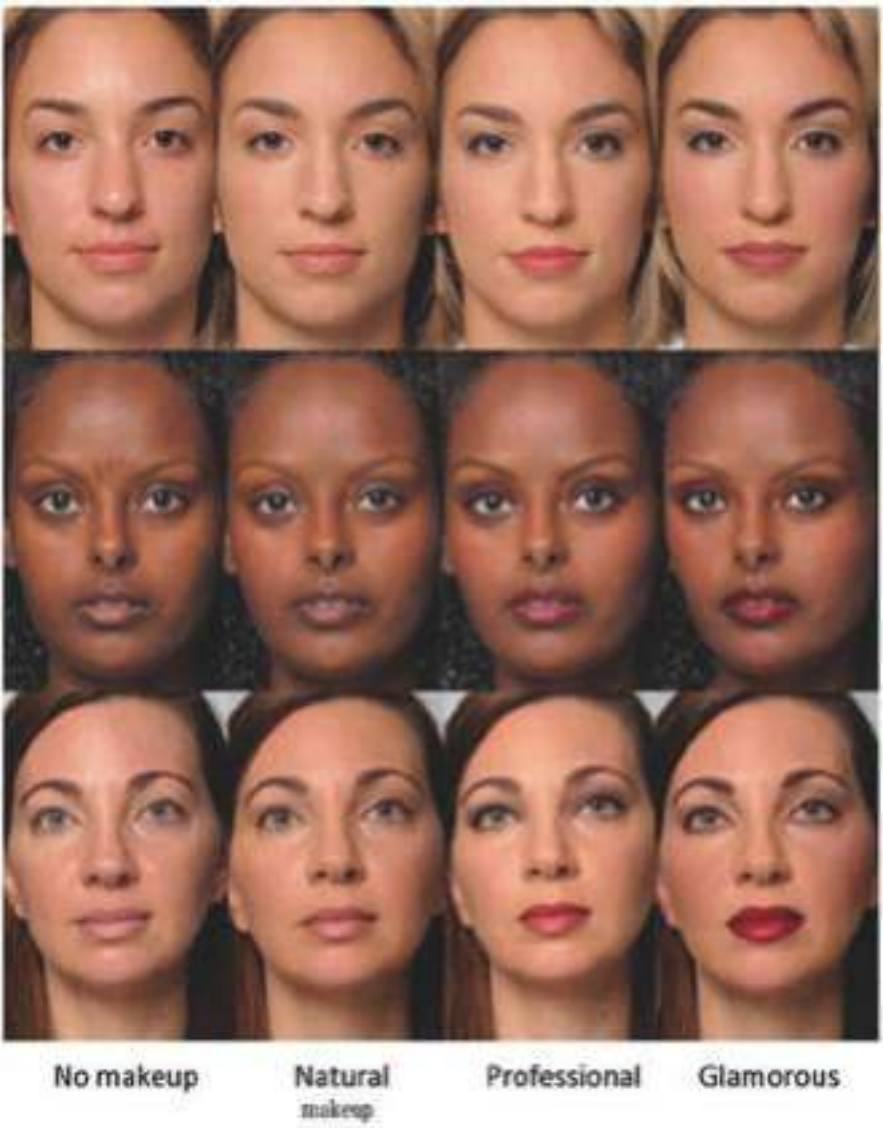

Fig. 1.6 Faces without and with different amounts of makeup. (http://fellowshipoftheminds.com/2013/07/07/looks-do-matter-7-ways-your-looks-affect-your-pay/)

of the historical aspects, science, and implications of beauty is quintessential for dermatologists, plastic surgeons, and others who practice aesthetic medicine. Humans are clearly hardwired to respond more favorably to attractive people, and many of our patients are driven to our clinics to enhance their looks and improve their quality of life.

Cosmetics, hairstyle, clothing, and even innate facial characteristics can be manipulated to enhance beauty (Fig. 1.6), and researchers show that there are several

Fig. 1.7 Young Korean woman before and after extreme plastic surgery. (http://memolition.com/2013/11/24/young-koreans-before-and-after-extreme-plastic-surgery-50-pictures/)

controllable aspects of appearance, such as grooming and makeup, that are related to overall ratings of physical attractiveness [61, 71]. In Korea, where big eyes, a high nasal bridge, and an oval-shaped face signify beauty, surgical procedures are quite popular and have been found to, statistically and significantly, improve an individual's facial attractiveness, the largest improvement seen for women and for those with a low initial level of beauty (Fig. 1.7) [72]. Researchers have further examined whether the improvement in attractiveness allowed for monetary benefits and ability to recoup the costs associated with plastic surgery due to the premiums that the labor and marriage markets place on beauty [72]. The answer is, yes. As attractive persons are more likely to earn higher annual income and also more likely to enjoy higher spousal income, those able to make exceptionally large improvements (moving from extreme positions of ugliest to prettiest) would be able to recoup the costs of surgery in just 1.3 years for men and 2.5 years for women [72]. This is a bit impractical, however, as the majority of persons cannot make this great jump, even with surgery. Realistically, the majority can expect a more modest beauty increase, on an average experiencing a 0.4 standard deviation increase in attractiveness scores, and may never be able to recoup the cost; men with mean beauty at onset were shown to be unable to recoup the surgical cost before retirement at age 65 [72]. Therefore, on average, the monetary benefit from plastic surgery is relatively small when compared to the surgical cost. This is comparable to findings looking at women's spending on cosmetics and clothing in Shanghai that show that although the additional money spent did marginally increase a woman's perceived beauty and pay, it overall generated little monetary benefit in the form of higher earnings [73].

Although we may not be able to directly recoup the spending costs on beauty enhancing products and procedures, there are clearly other societal gains for being more attractive. Beautiful people are more likely to go out on dates and are overall happier even when accounting for many other variables [69, 74]. Beauty's effect on life satisfaction is, both, indirect and direct. Direct effects impact women more, affecting happiness independent of its impact on income, marriage prospects, and other outcomes [69].

Each individual is clearly endowed with some innate level of physical attractiveness. History and research has shown us that there are clear advantages to be-

ing beautiful, which has prompted the response of the mass market as we are continuously met with new products, devices, and procedures that attempt to provide some form of beautification. People will go to great extent to try and increase their attraction. Data from The American Society for Aesthetic Plastic Surgery show that in 2013, over 11 million surgical and nonsurgical cosmetic procedures were performed in the USA with Americans spending over US$ 12 billion [75]. In that year alone, over 3.7 million injections of botulinum toxin were given, over 360,000 liposuction procedures were performed, and almost 150,000 received rhinoplasty procedures in the USA [75]. Although literature has shown us that looking good is correlated with happiness, it has also shown us that those who obsess about beauty are not happy [32]. Some of the most successful people have been of quite average attraction, the faces of Fortune 500 looking quite different than People's Most Beautiful list. Regardless, the importance of beauty is here to stay. Concern with beauty is not just an aberration of modern culture and western society. There is a scientific and evolutionary basis to theories of why the human mind finds certain attributes aesthetically pleasing, of why we stare longer at pretty faces, and of why we seek the friendship, companionship, and leadership from more beautiful people.

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Chapter 2
Objective Aspects of Beauty

Neelam A. Vashi

Scientific Basis

In most categories of life deemed to be important, beautiful people achieve more desirable outcomes. Human beings prefer to associate with the most beautiful as these people are considered to be more successful, intelligent, and interesting than their unattractive counterparts. The sight of a beautiful face has even been found to activate certain reward centers in the brain [1, 2]. Given the ubiquitous role of facial attractiveness, what are the characteristics that human beings find beautiful? For much of history, it has been assumed that preferences for beauty are gradually learned through cultural transmission and exposure to contemporary media. Charles Darwin, in 1871, became one of the first persons, if not the first, to think and write extensively about human beauty from a biological point of view, concluding that there is no universal standard of beauty with respect to the human body and attempts to determine underlying dimensions of beauty are futile [3]. However, in 1985, contrary to Darwin's beliefs, Samuels and Ewy showed that both 3-month-old and 6-month-old infants looked longer at male and female faces previously rated as attractive by adults, suggesting that infants have the cognitive ability to discriminate attractiveness [4]. These findings have been further supported, and it has even been shown that young infants show preferences for attractive faces, measured by looking time, that transcends gender, race, and age [5]. From this, we can see that facial cues that yield judgments of beauty seem invariant across different types of faces, and even young infants have the ability to perceive them [5]. In addition, cross-cultural investigations have demonstrated high interrater reliabilities in attractiveness judgments [5–9]. The Shiwiar of Equador and Ache of Paraguay have been shown to have reliable standards of attractiveness [10, 11]. In a study from an international

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sample, raters agreed about the attractiveness of female faces, and although the sample possessed ethnically distinct features, there was considerable similarity in facial features associated with beauty, including neonate features of large eyes, small nose, and small chin and maturity features of prominent cheekbones and narrow cheeks [7]. These cross-cultural and infant studies support the notion of the universality of beauty with some standards set by nature and not our social heritage. Rather than being the outcome of slow acculturation, beauty preferences seem to be a result of a basic cognitive process that appears quite early in life [12]. Underlying selection pressures and innate rules on how we construct beauty ideals have converging universalities across cultures [3]. In fact, agreement between individuals is one of the most robust findings in facial attractiveness research since the 1970s, suggesting that people everywhere are using similar criteria in their judgments [13]. It should be noted though that throughout the world and in many different cultures, men have consistently been found to place greater importance on women's physical attractiveness than vice versa [14–16].

Although the body has also been studied, the face, in particular, is a source of much curiosity to scientists and researchers because of the particularly well-developed ability of humans to process information from other's faces [13]. The body of literature examining facial attractiveness, mainly based on static images and recently validated by assessing video-clips [17], is quite robust. This validity likely stems from our tendency to make extremely rapid judgments on beauty. Humans have a nearly automatic tendency to categorize a person as attractive or unattractive, with the ability to differentiate within 100 ms [18]. Beauty can be assessed quite rapidly and from just small amounts of visual information. In one study, although participants reported that they could not accurately see the faces, they were surprisingly accurate in their ability to guess the attractiveness of the shown image [19]. Perceived attractiveness has also been shown to activate certain brain regions, circuitry, and reward centers [1, 20].

The universal appreciation of beauty grants many benefits to those awarded with features of attractiveness. Although one can often articulate that a face is beautiful, it is sometimes difficult to decipher the exact reasons as there are no absolute terms of what constitutes attractiveness. Research suggests that the main attributes that humans find universally attractive in others include facial averageness, symmetry, sexual dimorphism, and skin homogeneity. In this chapter, these characteristics are defined and supported with research and evidence from the scientific community.

Averageness

Sir Francis Galton's 1878 claim that photos of superimposed faces are more attractive than those of individual constituent faces has been repeatedly supported by experimental evidence [21, 22]. Interested in finding commonalities among criminals, Galton exposed portraits of several individuals consecutively onto the same photographic plate, creating an average of the individual faces and noting the extreme and surprising beauty of the average, superimposed images [21]. Averageness refers

to how closely a face resembles the majority of other faces within a population, e.g., a prototypical face [13]. It has been proposed to be the most important factor in determining facial beauty and even extreme departures from average on other traits deemed attractive (e.g., sexually dimorphic traits as discussed below) are not considered beautiful. The term average denotes the technical definition of a mathematical mean [23]. In 1990, Langlois et al. reproduced facial images of averaged faces by digitizing and mathematically averaging matrices of image intensity values [24]. Both male and female computer generated facial images from 32 faces were judged as significantly more attractive than the individual faces that had yielded the composite images [24]. These novel findings were originally met with skepticism as beauty is thought to be extraordinary. However, average is not a synonym for undistinguished nor does it mean typical in the sense of common or frequently occurring in the population [23]. The term average refers to a configuration, and mathematically averaging a sample of whole faces produces a facial configuration that is close to the population mean configuration [23]. The creation of an average face involves scanning the individual faces, converting each face to a set of numerical values, adding and dividing these sets to produce mean values, and regenerating the facial image [23]. Although composed of many rows and columns of small pixels that vary in intensity or shades of gray, the images are perceived as unified wholes [23]. In general, the more images added to a composite, the more attractive it is found (Fig. 2.1); averaged faces are not average in attractiveness, rather they are rated as more attractive than digitized images of the individual faces [5, 13, 24]. Interestingly, an averaged face does not communicate about a particular physical feature or size of that feature, and extensive evidence shows that this may not be important as perception involves visual processing of whole configurations [23]. Supporting this is the evidence that studies of individual facial features often yield inconsistent results [24]. A single feature of large eyes or tiny nose is, therefore, not the key to beauty.

In essence, attractive persons are more prototypical of, more representative of, and better examples of a population of faces, even though not common or frequently occurring [23]. Faces near the prototype or average may be processed more fluently, with greater speed and efficiency, and consequently preferred. In two experiments, participants categorized and rated the attractiveness of random-dot patterns or common geometric patterns, with results showing that being prototypical was a predictor of both fluency (categorization speed) and attractiveness [25]. In further support, when comparing neurocognitive and behavioral responses to attractive, unattractive, and averaged human faces, participants categorized averaged and high-attractive faces more rapidly and with a reduced amount and need for neural activity, as tested by event-related potentials [26]. A strong relationship has even been found between averageness and attractiveness for dogs, wristwatches, and birds, supporting a prototype theory [27].

The attractiveness of averageness has been found using both real and computer-manipulated faces with large effect size and cross-cultural agreement (Fig. 2.2) [22]. Evidence shows that young infants prefer to look at average, prototypical faces that adults find attractive [12, 24]. Preferences for averageness have not only

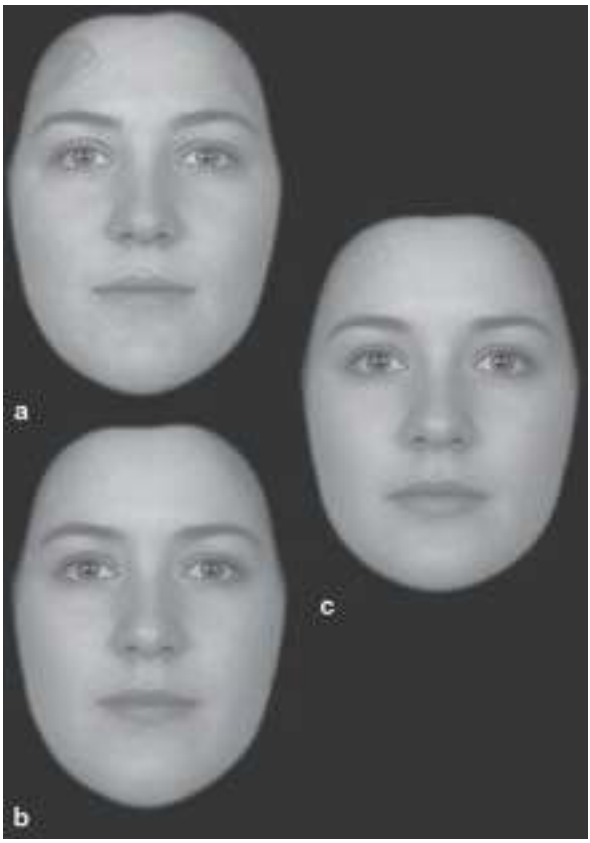

Fig. 2.1 Averageness. A composite image made from three images (**a**), the same image given the color of nine images (**b**), and a shape and color composite made from nine images (**c**). Image (**c**) is typically considered more attractive as it is the most averaged of all the images [13]

been found in westernized societies but have also been found in an isolated hunter-gatherer society, the Hadza of Northern Tanzania (Fig. 2.3) [28]. Given that the Hadza have little exposure to the outside world, they provide very strong support to the argument that the preference for averageness is universal, rooted in biology, and not dependent on media socialization [28]. It has also been found that averaged faces are attractive in both Chinese and Japanese cultures [29].

It has been suggested that mental representations of what is average are constantly updated by accumulated experience, and it is this experience that determines our internal prototypes and influences what faces we find most attractive [22, 28, 30]. Newborns prefer to look at averaged composites of faces they have seen compared to composites that they have not seen [31]. In a comparison study with 5-year-olds, 9-year-olds, and adults, all groups rated the more average faces of different ages as more attractive, with the association becoming stronger as age increased [32]. It has been suggested that developmental changes may reflect the refinement of an average face prototype as visual perception develops and children are exposed to more faces [32]. Interestingly, viewing contorted faces can adjust one's perception of a prototype, averageness, and attractiveness. Brief exposure to consistent facial dis-

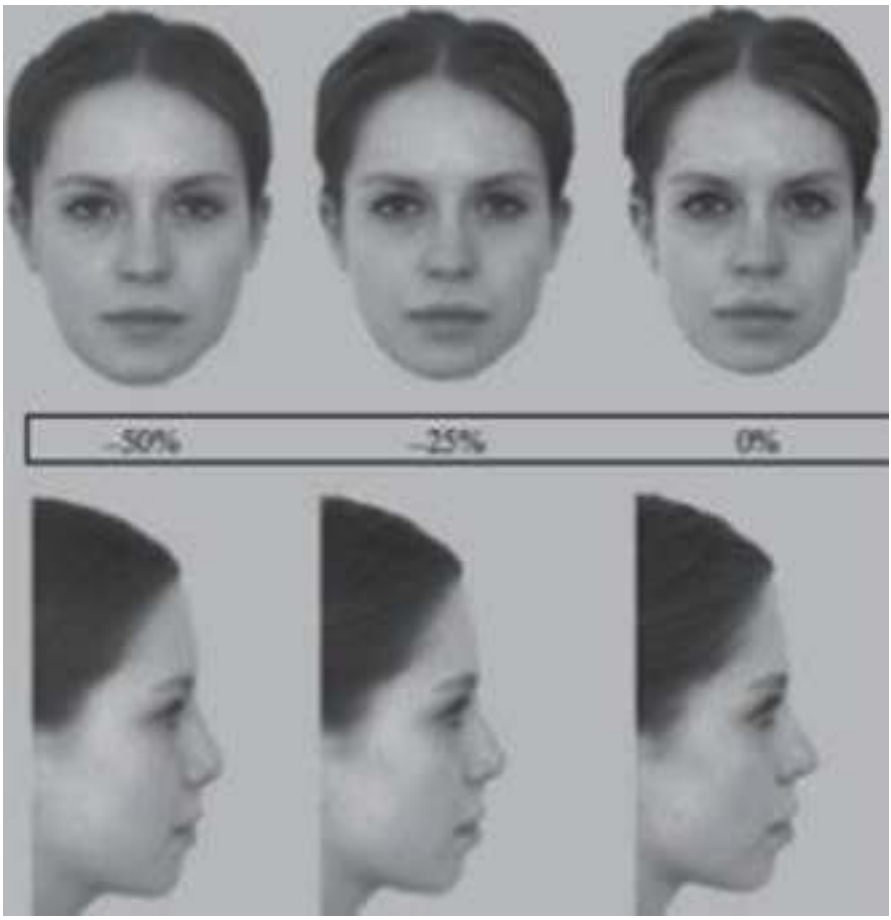

Fig. 2.2 An example of stimuli used in averageness research. In this figure, −25% and −50% denote 25% and 50% morph toward the average from the baseline image of 0% [42]

tortions shifts what looks most normal and attractive toward that distortion [33–35]. Young children shown storybooks with distorted (contracted or expanded) faces lead to shifts in judgments of attractiveness, with a higher likelihood of choosing a distorted face as "prettier" after viewing the storybook than prior [36]. This provides evidence that attractiveness judgments are malleable and can be influenced by our surroundings and a continuously updated face prototype. Analogous visual after-effects have been observed following exposure to faces varying in ethnicity, gender, and expression [37]. These findings demonstrate that perceptual adaptation can reconstruct preferences and is thought to reflect changes in the responses of neural mechanisms underlying face processing [13, 38].

Critics have suggested that other factors might explain the appeal of composite, superimposed images [39]. In particular, symmetry is highly associated with averageness and attractiveness. However, averageness independently contributes to

Fig. 2.3 Female and male Hadza 5-face composites (*top*) and 20-face composites (*bottom*) [28]

attractiveness when symmetry is statistically controlled [29, 40, 41]. In addition, faces photographed in profile, where direct cues to bilateral symmetry are absent, are also judged to be more attractive after being transformed toward the group average [42]. The appeal of averageness cannot be explained by a youthful appearance as it remains attractive when this factor is statistically controlled [43]. It has also been found that forming composite images smoothens skin texture as imperfections and blemishes are averaged. This has been accounted for in multiple studies and even when skin color and texture are controlled for, averageness has been found to independently influence attractiveness judgments [13, 28, 41, 44]. Studies using computerized caricatures and line drawings, which remove the influence of skin tone and texture, have found attractiveness to increase with averageness and negatively correlate with distinctiveness [45]. The importance of averageness to attractiveness judgments is quite robust, and multiple studies have shown that adult preferences for averaged faces cannot be explained by symmetry, blur, youthfulness, or other artifacts that also contribute to beauty which are discussed below [23].

Symmetry

Symmetry refers to the extent to which one half of a figure is the same as the other half around a medial axis. Fluctuating asymmetry (FA) is believed to reflect developmental instability and is described as the random deviation from perfect bilateral symmetry in morphological traits that is produced by genetic or environmental stressors during embryonic development [46, 47]. Fluctuating asymmetries are randomly distributed across individuals so that there is no consistent left or right bias in the population. Directional asymmetries, on the other hand, have a consistent left or right bias across a population (e.g., location of the heart), are not produced by stresses during development, and are not thought to impact attractiveness judgments [48]. Although there are some reports of right-sided facial dominance [48] and enhanced left-sided expressiveness [49], these asymmetries are subtle and do not affect attractiveness. Rather, deviations around them, the fluctuating asymmetries, do affect beauty judgments in that there is a negative correlation between FA and facial attractiveness [50–52].

The preference for facial symmetry spans species and cultures. Macaque monkeys gaze longer at symmetrical than at asymmetrical conspecifics [53]. Researchers have demonstrated that hens repeatedly exposed to asymmetrical stimuli around a symmetrical mean come to prefer symmetrical stimuli to which they have not been previously exposed [54]. Symmetry has long been a fascination in both scientific literature and media. Brad Pitt is considered to have one of the most symmetrical faces in Hollywood (Fig. 2.4). There is even an online tool, Symmeter, that offers a web-based system to measure the symmetry of any person from a digital image [55]. A score is provided on a scale of 100, with the typical human face averaging a 92 [55, 56].

Symmetry has been commented on and studied extensively, and the true importance of symmetry has actually been under great debate. In fact, many early studies suggested that symmetrical faces were not preferred to perfectly symmetric versions [23, 57–59]. However, later and more recent studies found that perfectly symmetric faces were more attractive than the original, less symmetric faces [60, 61]. This discrepancy reflects differences in how the perfectly symmetric faces were made [22]. Early studies reflected hemifaces around a vertical midline to create two symmetric chimeras, with slight deviations from frontal views resulting in abnormally wide or narrow chimeras with abnormal eye spacing [22, 57, 58]. Such faces are perfectly symmetrical; however, these images display structural abnormalities in ratios and sizes of the midline features, appearing quite unattractive (Fig. 2.5). The more recent studies made images by using landmarks and blending normal and mirror-reversed images and show that attractiveness can be altered by manipulation of the symmetry level [40, 61]. A meta-analysis confirmed that symmetry is considered attractive when blends are used but not when using chimeras [22].

Symmetry has been correlated with rated attractiveness from natural, real facial images in both females and males [62–66]. Even in a study of monozygotic twins, the more symmetric twin of the pair was consistently rated as more attractive

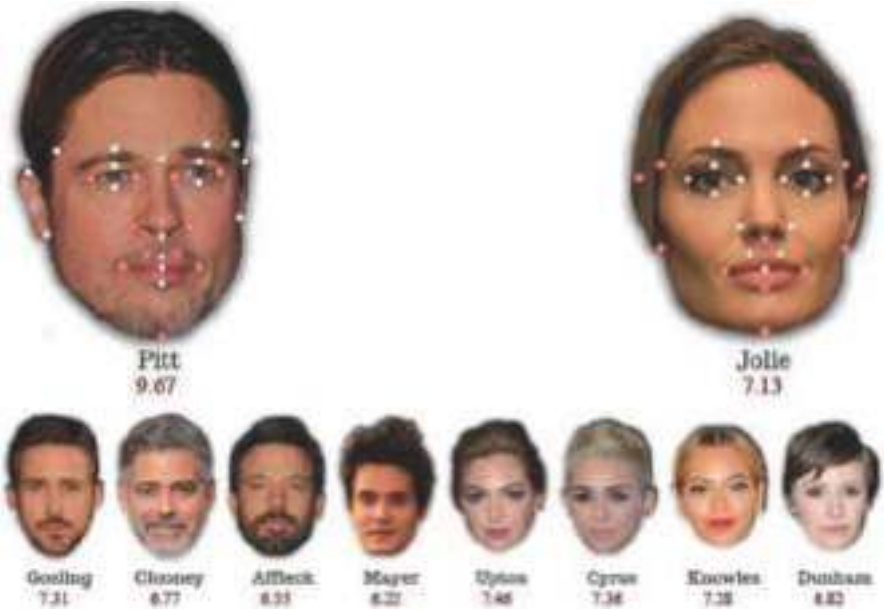

Fig. 2.4 Using a formula based on symmetry and proportions of 29 different points, Dr. Kendra Schmid calculates a score between 1 and 10. Most ordinary people score between 4 and 5 based on this formulation, while celebrities typically score above 6. http://www.huffingtonpost.com/2013/02/26/scientifically-beautiful_n_2741136.html. Graphic by Chris Spurlock. (Source: Kendra K. Schmid, PhD, Assistant Professor, Department of Biostatistics, Director, College of Public Health Masters Programs, Nebraska Medical Center)

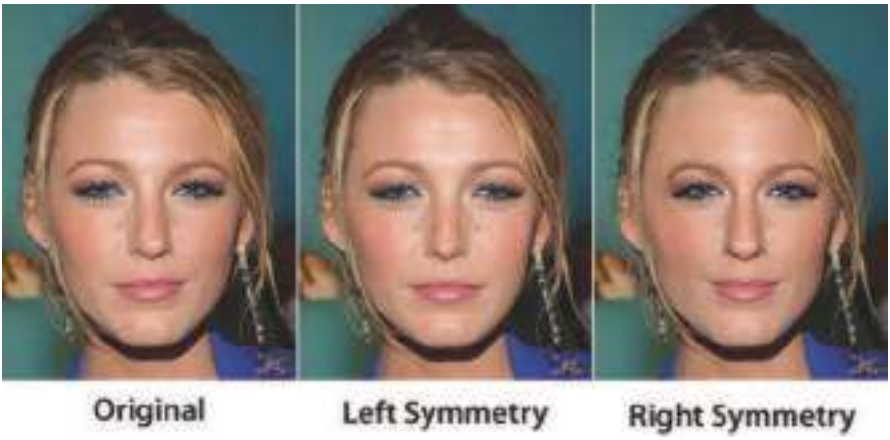

Fig. 2.5 Blake Lively made more symmetrical from *left* and *right* chimeras. http://forums.soompi.com/en/discussion/2013148/face-symmetry

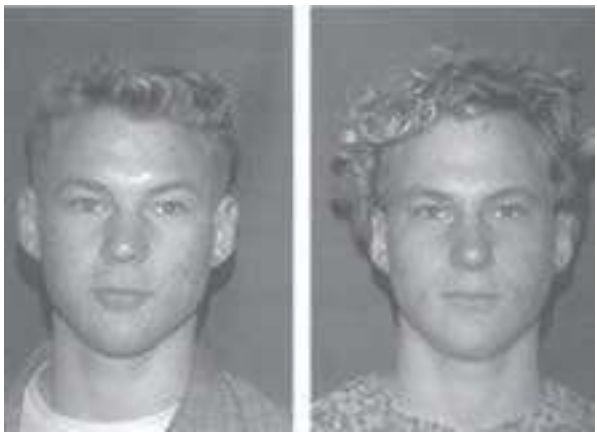

Fig. 2.6 When shown pairs of monozygotic twins, the twin with more symmetric measurements (*right*) is seen as more attractive [67]

(Fig. 2.6), and the magnitude of the difference was directly related to the magnitude of the difference in symmetry [67]. Paralleling the findings of naturally occurring symmetry, studies of manipulated faces using sophisticated graphic software with blended images have demonstrated that producing more symmetrical photographs influences attractiveness [60–62]. When averageness and symmetry were independently manipulated, multiple studies have found that these attributes both positively and independently contribute to attractiveness [40, 41]. Faces morphed toward the average were perceived as more attractive, but the effect was significantly stronger with a full-face verse profile view, supporting the independent influence of symmetry [42]. Controlling and accounting for skin texture has also shown an independent influence of symmetry on attractiveness judgments [60, 62]. There is also cross-cultural preference for symmetry. In a study examining the preferences for symmetry in both the UK and Hadza, a hunter-gatherer society of Tanzania, symmetry was more attractive than asymmetry across both cultures and more strongly preferred by the Hadza [68]. In addition, Japanese raters preferred perfectly symmetric versions of facial photographs [29].

Extrapolated from extensive research, we can conclude that although some degree of symmetry is important to attractiveness, symmetry does not solely determine perceived attractiveness in a range of normal faces with no craniofacial deformities [23]. In fact, perfectly symmetrical faces may not be considered attractive at all. Take Cindy Crawford for example, well known for her asymmetric mole (Fig. 2.7). Imagine moving the mole directly to the center of her face. Although this produces a more symmetrical image, the majority would deem this to be less attractive than the original. Ascertaining the exact contribution of symmetry to attractiveness is difficult, and disparate studies using different methodologies have produced somewhat conflicting results and gender differences; however, the overall consensus leans toward a greater impact of averageness than symmetry [22, 69, 70]. In summary, symmetry is clearly associated with beauty; however, we do not know the extent to which this drives attractiveness judgments.

Fig. 2.7 Cindy Crawford. (Photograph courtesy of "Cindy Crawford Cannes 2013" by Georges Biard. Licensed under CC BY-SA 3.0 via Wikimedia Commons—http://commons.wikimedia.org/wiki/File:Cindy_Crawford_Cannes_2013.jpg#mediaviewer/File:Cindy_Crawford_Cannes_2013.jpg

Sexual Dimorphism

Sexual dimorphism refers to the phenotypic difference in adult human faces that reflect the masculinization or feminization of secondary sexual characteristics. During adolescence, sexual dimorphism is ontogenetically enabled by ratios of testosterone to estrogen. In men, a high ratio influences facial growth until the early 20s, facilitating the forward growth of the bones of the eyebrow ridges; the lateral growth of the cheekbones, mandibles, and chin; and lengthening of the lower facial bone [71]. Male typical traits include broader and longer chins, deeper and narrower eyes due to brow ridge development, facial hair, and thinner lips. The influence of estrogen inhibits the growth of these traits and leads to typically female features of smaller jaw, higher eyebrows, fuller lips, and smaller lower to upper face ratio [50]. Hormonal profile and face shape has been linked [13]. Studies show that women with higher circulating estrogen have more feminine faces and men with high testosterone have more masculine features [72, 73].

Evidence that facial sexual dimorphism is attractive is much clearer for female femininity than for male masculinity (Fig. 2.8). Although preferences for masculinity in male faces vary across studies, feminine female faces are consistently found more attractive than masculine female faces [7, 11, 22, 30, 74–77]. This has held true for studies conducted on both naturally occurring and manipulated composite faces [7, 11, 22, 74] and also cross-culturally [73, 74, 78]. In fact, exaggeration of feminine features further increases attractiveness [74, 75, 78]. When subjects were asked to generate beautiful female faces using a computer, they produced faces with more feminine traits than the average [75]. Positively correlated with attractiveness ratings were the feminine neonate features of large eyes, small nose, and small chin; feminine maturity features of prominent cheekbones and narrow cheeks; and expressive features of high eyebrows and large smile [7]. Certain features are considered feminine as they are sensitive to the rise in estrogen levels that accompanies

Fig. 2.8 Female composite picture made more masculine (*left*) and more feminine (*right*) [13]

puberty. As women age and approach menopause, androgens increase relative to estrogen levels, causing facial and body features to take a more masculine form. In a study searching for a link between beauty and fertility, faces corresponding to a decreasing level of attractiveness, number of children, and number of pregnancies had thinner lips, flatter noses, broader eyebrows, and more angular jaws than the consensus [50]. More attractive faces had fuller lips, smaller and more tapered noses, higher arched eyebrows, larger pupils, and less angular jaws [50]. The relative contributions of average and nonaverage, sexually dimorphic facial traits to attractiveness judgments in women remain to be investigated.

The link between male masculinity and attractiveness is less clear and, contrary to predictions, studies of women's preferences for male faces have reported variable preferences [22, 79]. Studies have shown female preferences for masculine faces [65, 79–81], for feminine faces [44, 74, 78], and no effect of masculinity–femininity on male facial beauty [82]. One study showed no evidence of directional selection for increased or decreased testosterone in terms of attractiveness to the male sex [82]. Some groups have found a female preference for feminized male face shapes [74, 78]. These face shapes were also given the positive attributions of cooperativeness, warmth, and honesty opposed to masculinized faces, which were given negative attributions of coldness and dishonesty [74]. A meta-analysis concluded that masculinity is attractive when normal male faces are used but unattractive in manipulated, sex-continua obtained male faces [22]. Although it is still under debate whether women's masculinity preferences reflect individual differences versus differences in the methods used to construct the stimuli, a study comparing methodology has shown that it is more likely secondary to individual differences as predicted by evolutionary theories discussed in the following chapter [79]. It has been suggested that the preference for feminized male faces may reflect the perception of more positive personality traits (less dominant, more honest, warmer, and more likely to be a good parent) in less masculinized faces [74]. There is evidence that women's preferences for masculine male face traits change across the menstrual cycle, indicating that women have greater preferences of masculinized male faces during fertile phases [81, 83]. Skin color is sexually dimorphic within all races,

with men generally having darker skin than women [83, 84]. Women in the fertile phase have shown preferences for darker complexions in male but not female faces [85]. Preferences for masculine traits in male faces have also been found to interact with the specific context of the judgment (short- or long-term relationship) and life-history variables (presence or absence of a partner) [86]. Women prefer masculine men in short-term partners and more so when there is a presence of a partner in extra-pair copulations [86]. Overall, there is insufficient data to determine whether masculinity is attractive in male faces and is likely dependent on multiple motives and contextual variables.

Body Fat Distribution

Body fat distribution is a sexually dimorphic trait. Sex hormones affect specific regional adiposity and regulate utilization and accumulation of fat [87–89]. The most striking gender-specific difference in the physiology of fat accumulation and utilization are observed in the abdominal and gluteofemoral regions. Testosterone stimulates fat deposits in the abdominal region and inhibits fat deposits in the gluteofemoral region. Estrogen inhibits fat deposits in the abdominal region and maximally stimulates fat deposits in the gluteofemoral region more than in any other region of the body. This produces an android (male) or gynoid (female) body fat distribution. The gynoid and android fat distribution can be ascertained by measuring the waist (narrowest portion between ribs and the iliac crest) and hip (at the level of the greatest protrusion of the buttocks circumference) to compute a waist-to-hip ratio (WHR) [88]. Before puberty, both sexes have similar WHRs; however, after puberty, females deposit more fat on the hips. Therefore, WHR becomes significantly lower in females than in males. WHR has a bimodal distribution, with relatively little overlap between genders [90]. The typical range of WHR in healthy premenopausal women is 0.67–0.80, indicating a more curvaceous body shape with low abdominal adiposity, and is 0.85–0.95 in healthy men [88, 91]. Women typically maintain a lower WHR than men except during menopause when female WHR becomes similar to that of males [88, 92]. Studies show that men judge women with a low WHR as attractive [88, 93–98]. The most preferred WHR in women is 0.7, compared to a mean in most populations of 0.75–0.8 [88]. Studies have also shown a curvilinear relationship between attractiveness and WHR, with 0.7 the most preferred and 0.5 and 1.2 the least [95].

The British model, Twiggy, who embodied slenderness ideals of fashion models in the early 1960s, had a bodily measurement of 31-24-33 (bust-waist-hips), giving her a low female WHR (0.73). In England, one of the earliest cosmetic surgeries consisted of removing two lower ribs to enhance the narrowness of the waist [94, 99]. The popularity of the corset, in spite of the internal injury it caused, and fashionable clothing that stressed tiny waists and exaggerated hips are endorsements for the relationship of waist to hip as a symbol of beauty. In Western societies, a narrow waist set against full hips has been a consistent feature for female attractive-

ness. Women try to achieve this through body sculpting (e.g., liposuction) and use of various undergarments that work to give the appearance of a slender waist and low WHR. In Hollywood, Kim Kardashian has a WHR of 0.66 and Victoria Secret model, Adriana Lima, has a WHR of 0.68.

Whereas other body features have been given various amounts of importance over the years (such as bust size and overall body weight), the narrow waistline emerges as one of the most enduring bodily features throughout changing ideals of female attractiveness [88]. In the 1980s, Garner et al. studied Miss America contestants [88, 100, 101]. Although contestants were found to become overall significantly thinner, the WHR remained relatively constant, with the average body measurement (bust-waist-hips) of Miss America contestants in 1940 being 34-24.5-35 (WHR = 0.70) and in 1987 being 35-23.5-34.5 (WHR = 0.68). To establish that WHR represents an important feature that men find attractive, further studies have demonstrated that male ratings of female attractiveness are significantly correlated with WHR. The lowest studied WHR of 0.7 in a normal weighted woman was located closer to attractiveness, sexiness, and good health as well as desire and capability for having children than any other figure (Fig. 2.9) [88]. Young children do not show a preference for the waist-to-hip ratio that is found attractive by adults, demonstrating differences in ratings that may reflect pubertal development [102].

Since the landmark studies by Singh et al., there has been much debate as to the true effect of WHR on female attractiveness [88, 93, 103–105]. Both anthropometric indices of body mass index (BMI) and WHR explain a high percentage of variance in judgments of attractiveness and tend to positively correlate in both synthesized and natural stimulus sets used in attractiveness research [103]. Multiple studies supporting the role of WHR in attractiveness have manipulated WHR by altering the width of the waist in line drawings or photographic images which also changes BMI [10, 88, 94, 106, 107]. In a recent attempt to address this, observers were asked to rate pre-and postoperative photos of women who had plastic surgery to redistribute fat from around the waist to the hip and buttocks regions, therefore, manipulating WHR but not BMI. Postoperative photographs were judged as more attractive, leading to the conclusion that WHR was the key determinant to female attractiveness [93]. However, other studies, made from Western observers, claim that BMI explains the majority of the variance in attractiveness, with a BMI between 20 kg/m^2 and 24 kg/m^2 being optimal [103, 105]. It may be the case that WHR acts as a predictor of attractiveness but only that component of it that is directly attributable to overall body fat [103]. Although BMI and WHR are positively correlated and associated with bodily attractiveness measures, to the degree that each contribute and covary with one another is under debate.

In regards to the male physique, minimal research has addressed body fat distribution and female preferences for male body features. The waist-to-shoulder ratio (WSR) is generally considered to be sexually dimorphic, and women have been found to prefer men with a “V-shaped” torso, having broad shoulders relative to the waist or hip size [108–110]. In one study, a WHR of 0.8–0.9 and WSR of 0.6 was rated as most attractive in males [108]. An overall predominant theme in male body attractiveness is the presence of high muscularity and low fatness [70]. However, studies are overall limited and have been studied in few cultures.

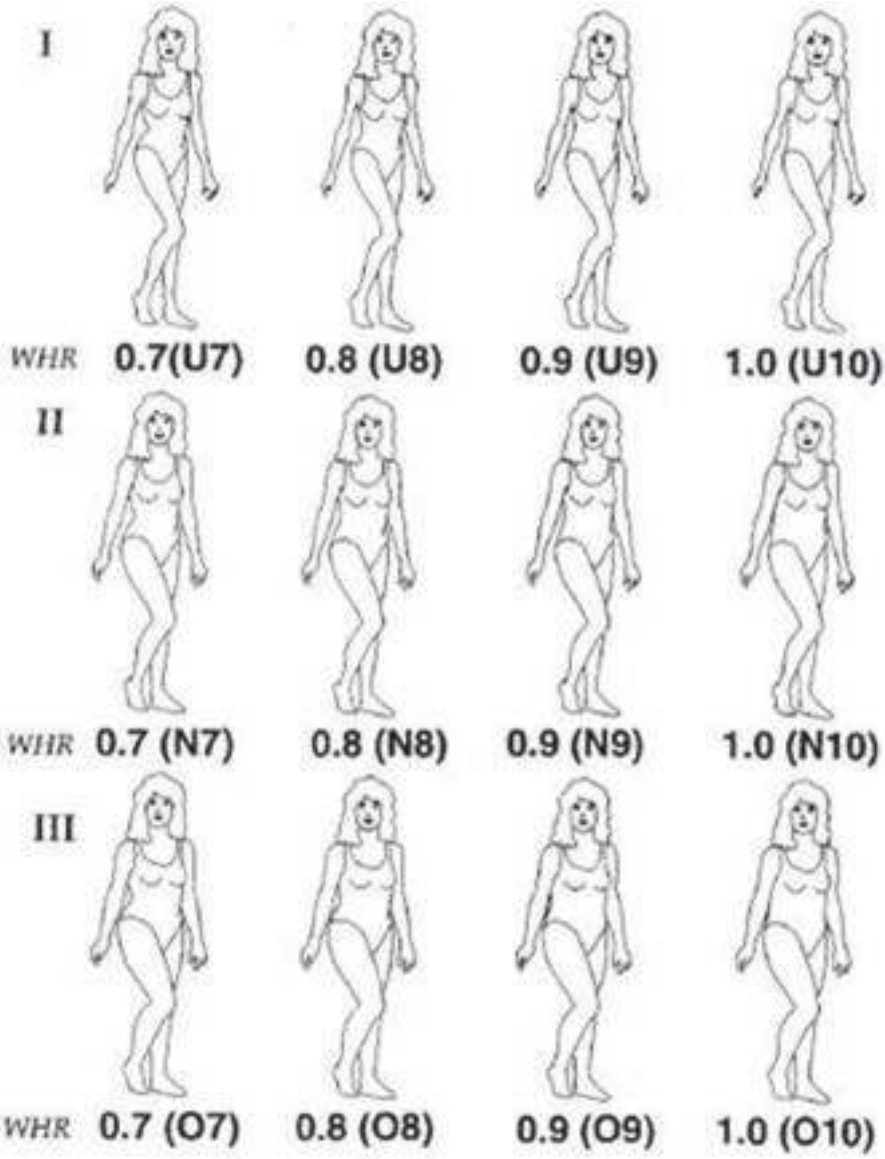

Fig. 2.9 Stimuli of 12 line drawings of female figures, representing 4 levels of WHR (0.7, 0.8, 0.9, and 1.0) and 3 levels of body weight (normal, under-, and overweight) [88]

Skin Homogeneity

Skin homogeneity refers to the even distribution of skin color and texture. Flawless skin is thought to be a universally desired human trait. This concept is supported by the vast use of cosmetics to refine and create a homogeneous skin surface. Research

supports theories that visible skin condition, skin surface topography, and coloration can independently signal attractiveness, youth, and health [111]. In averageness research, it has been shown that the more images that are blended together, the smoother the skin texture becomes, as imperfections such as lines or blemishes are averaged. Skin homogeneity has been considered a confounding factor given the positive effects that averaging skin texture has on beauty [39]. However, averaging in both shape and texture have been found to increase attractiveness independently, showing that increased attractiveness of composites is due to the combined action of both manipulations [44]. Being able to view the world through edges of contrast, even very subtle differences in skin quality can have pronounced effects on facial attractiveness judgments [44, 112]. In an eye tracking study, female facial stimuli with even skin tones attracted more visual attention, and this higher attention was associated with more positive judgments in regards to health and beauty [113]. Many studies have reported a link between texture and color surface cues with both male [44, 85, 114–116] and female [112, 113, 117, 118] facial attractiveness.

Female faces with smooth, homogeneous skin color distribution are typically perceived as younger and receive significantly higher ratings for attractiveness than those rich in contrast [117]. On further manipulation with standardized female stimulus faces and removal of information related to skin surface topography (e.g., facial furrows, folds, wrinkles), visible skin color distribution alone was found to influence attractiveness [118]. Manipulating color and texture information along a continuum influenced female judgments of both the attractiveness and visible skin condition of male faces that was independent of face shape [114]. Utilizing cropped skin cheek images rather than whole face images, skin color homogeneity influenced perceptions of age, attractiveness, and health in male and female faces [112, 116]. Images of skin cropped from younger faces were judged as healthier and more attractive. Perception was strongly related to melanin and hemoglobin distribution, such that more even and synchronous distributions (e.g., homogeneity) led to greater perceived attractiveness [112, 116]. Photoaging is clearly contributory by its production of localized concentrations and subsequent heterogeneous distribution of melanin along with vascular damage and hemoglobin-related chromophore changes [112]. Digitally isolated cheek skin of male faces have shown similar results and the ability to even predict overall attractiveness [115]. Skin health may be a particularly useful marker of current health condition [119] and predict attractiveness as it is more changeable than aspects such as symmetry or averageness. In summary, many studies have shown us the importance of skin homogeneity and independent of facial form and skin surface topography, skin color distribution, evenness, and texture influence the perception of health and beauty.

Other Traits

Averageness, symmetry, sexual dimorphism, and now skin color and texture appear to be the most consistently linked traits to human attractiveness judgments. Other important attributes that have also received much attention include proportions and

youthfulness; however, these have more conflicting evidence and are under debate as to their true importance. It is generally believed that the face is more important for judgments of attractiveness than body components. However, other specific bodily traits related to bodily attractiveness including body mass index, muscularity, breast size, and leg length have been the focus of recent empirical research [120–122]. In addition, taller men are considered more attractive and are preferred by women than those of average height [70, 123], and symmetrical bodies are considered to be more attractive [124]. In the final section of this chapter, we further discuss proportions and youthfulness and how they are associated with beauty.

Proportions

It is thought that our brain is also programmed to recognize certain proportions as more pleasing. For centuries, enthusiasts of beauty as a measurable and objective attribute have communicated ideal proportions, or beauty canons, in a variety of ways. According to Vitruvius, in a well-proportioned face, the distance from chin to nostrils, from nostrils to eyebrows, and from eyebrows to hairline are all equal. The Vitruvian thirds is a concept that is still used today in facial reconstructive sur-

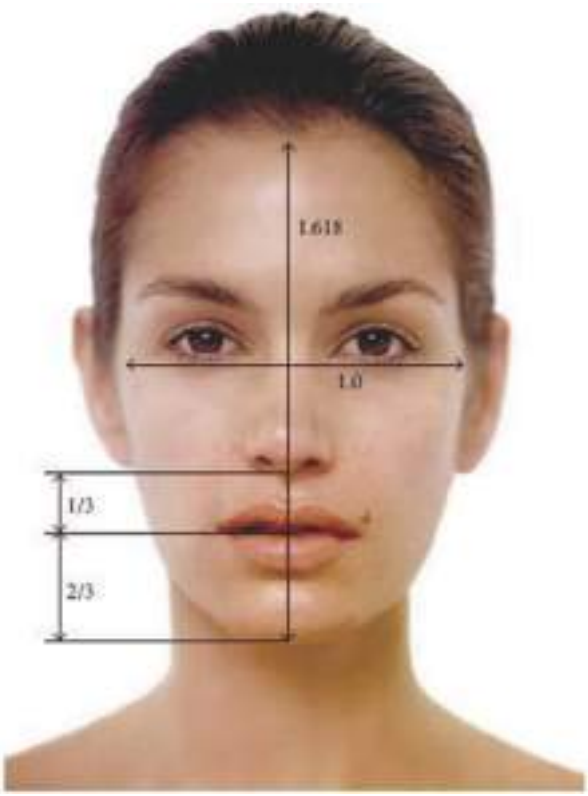

Fig. 2.10 Example of measurements that are consistent with the divine proportions [137]

gery [125]. The idea of divine proportions, or the golden ratio, stems from ancient times. It was first mentioned in 300 BC by the Greek mathematician Euclid in his book, *Elements* [126]. The golden ratio refers to a ratio of 1.618:1. Two quantities are in the golden ratio if the ratio of the smaller section to the larger one equals that of the larger section to the whole [127]. The point at which the line is divided is represented by the symbol ϕ (phi), derived from the Greek sculptor Phidias who is thought to have used it in his design of the Parthenon [125, 128]. This mathematical relationship has been repeatedly reported to occur in beautiful things (Fig. 2.10). The divine proportions have been recognized in numerous natural phenomena, architectural constructions, and art. The Notre Dame (Fig. 2.11) in Paris and Leonardo Da Vinci's *The Last Supper* and *Mona Lisa* (Fig. 2.12) have been thought to illustrate the golden proportions. In India, it is thought to be used in the construction of the Taj Mahal, which was completed in 1648.

There is much supporting literature that attempts to describe the ideal facial proportions in terms of the golden ratio and attractiveness [127, 129–137]. For example, ideal upper to lower lip and width of nose to mouth are purportedly 1:1.618. However, the true importance of this concept is under debate as much literature has also shown limited to no relationship between the golden ratio and facial attractiveness [138–143]. Much of our knowledge of the golden ratio in facial aesthetics comes from the orthodontics literature. In 1982, Ricketts advocated the use of the golden proportions, claiming that the analyses of beautiful faces can be approached mathematically [131]. In 2010, Pancherz et al. analyzed frontal view facial photos.

Fig. 2.11 Notre Dame

Fig. 2.12 Leonardo Da Vinci's *Mona Lisa*

Five transverse and seven vertical facial reference distances were measured and compared with the corresponding calculated divine distances (1.618:1). They found that attractive individuals had facial proportions closer to the divine values than nonattractive ones [132]. Stephen Marquardt's Phi mask (Fig. 2.13) or alternatively termed the facial golden mask, being derived from the golden ratio, has been favorably reviewed by many authors as a suitable tool for facial analytics [144–146]. However, this too has been challenged and placed under scrutiny as it is thought to represent a nonideal masculinized woman and also found to be ill-suited for non-European populations [147]. Other contradictory studies have shown an association with different ratios and beauty parameters [139, 148]. It has been argued that given the tremendous number of potential proportions in the human face, some of them are bound to approximate certain ratios, including the golden ratio, by mere chance [147]. Many plastic, cosmetic, and dermatologic surgeons use the golden ratio when deciding upon surgical treatments. Calipers (Fig. 2.14) that are made to the golden ratio can be used to assist in these measurements. As many believe and support the concept of the golden ratio, more research, including cross-cultural studies, is needed to fully understand ideal proportions in relation to beauty parameters.

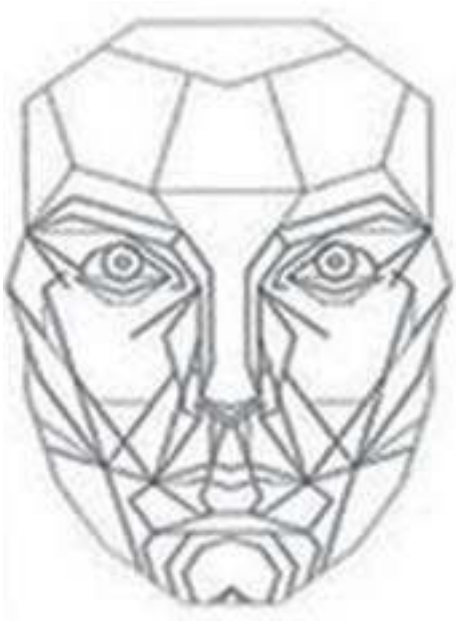

Fig. 2.13 Marquardt's Phi Mask. http://www.beautyanalysis.com/beauty-and-you/making-beauty/

Fig. 2.14 Calipers

Youthfulness

The association of youth and beauty is well accepted in modern day society. The human desire for homogeneous skin color and texture, lustrous hair, and absence of wrinkles and sagginess has fueled the cosmetic and surgical industry to provide ways to improve these attributes. To some extent, a more youthful appearance can be obtained through the use of makeup; however, cosmetic surgeries which offer more long-lasting solutions are on the rise. Botulinum toxin, blepharoplasty, and soft-tissue fillers are all popular cosmetic treatments that enable the improvement in wrinkles, eyelid sagginess, and volume loss respectively. Color, volume, and luster of hair also indicate age with the hair of younger women and men judged to be of higher quality [14, 149]. Strategic combing, toupees, wigs, hair dyes, hair growth tonics, dietary supplements, laser follicular stimulation, prescription medications, hair implants, and hair transplants have all been successfully marketed and used by those with concerns regarding hair loss. Although literature has focused on facial attractiveness, a youthful look also includes a slim, hairless body that is often obtained by dieting, exercising, weight loss surgeries, liposuction, and a variety of hair removal methods [150].

A youthful or neotenous face is one that combines a high ratio of neurocranial to lower-facial features including large eyes, small nose and ears, and full lips, along with a paler skin tone [151, 152]. Women who possess these features and look relatively young are consistently rated as more attractive than older appearing women [151, 153, 154]. Most studies find that neotenous facial proportions and features contribute to female attractiveness, while results for males are overall equivocal [7, 11, 43, 75, 151, 155, 156]. In a cross-cultural study, across five populations, women were perceived as more attractive to the extent that their predicted ages, calculated from facial proportions, were less than their actual ages [151]. Even when interviewers are explicitly instructed to adjust for age and sex of participants, looks of younger people are rated on average more favorably than those of older people [157]. Studies on skin color and texture have demonstrated that humans have a preference for younger appearing skin that is viewed as both healthier and more attractive [112, 115, 116, 118]. Skin texture studies have shown that the effects of skin color distribution can account for up to 20 years of perceived age [118]. However, the true importance of youthfulness is under debate as other authors argue that a neotenous appearance is not a requirement for attractiveness [23, 151].

Summary

Various morphological features, including the many discussed in this chapter, likely make independent but additive contributions to attractiveness judgments. Averageness, symmetry, sexual dimorphism, and, more recently, skin color, texture, and topography have received the most attention and support for the link to attractiveness.

The relative contribution of each is still under debate. Evolutionary psychologists argue that it is these attractive features that matter most when it comes to the assessment of an individual's quality. The following chapter will discuss theories as to why these particular qualities have come to have such importance and value on beauty assessments.

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Chapter 3
Evolutionary Basis of Attraction

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Infant Preferences for Attractive Faces

The long-held belief that extensive socialization accounts for our preferences for attractiveness was debunked in the 1980s when researchers studied infant preferences for attractive faces. In 1987, Langlois studied infants 2–3-months old and 6–8-months old, and showed that both the older and younger infants spent more time looking at previously rated attractive faces when these photographs were shown paired with less attractive faces of adult women (Fig. 3.1; [1]). This attractiveness phenomenon has further been found for stimulus faces that are male, of different races (African American or Caucasian), and/or even infant faces [2]. To better understand the formation of facial preferences, newborn infants (age range 14–151 h from birth) were studied and were also found to look longer at photographs of faces that adults rated as attractive than those photos rated as unattractive [3].

One interpretation of these findings is that there is an innate perceptual mechanism that detects and responds specifically to faces, and that newborns give more visual attention to attractive faces because they internally are trying to match an innately provided face template [3, 4]. A more commonly accepted interpretation of these findings is the prototype theory. This theory proposes that attractive faces are preferred because they represent the central tendency or average of the population of facial configurations and are thus prototypical [4, 5]. This is supported by other research and prior definitions of prototypes representing the central tendency of a category and also the preferred member of the category [6, 7]. The representative facial prototype then may be the comparison by which other faces are evaluated against, just as other prototypes (such as dots, sounds, even furniture) are used to judge other members of a certain category [5]. In computer modeling research, an

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Fig. 3.1 Prototyped female faces of high (*left*) and low (*right*) attractiveness used in infant attractiveness research [1, 2]

attractive prototype emerges when between 16 and 32 faces are averaged, and, furthermore, an average face of 32 faces looks very similar to any other 32 averaged faces even when created from completely different constituent faces [4, 5, 8]. It can then be theorized that an infant needs to merely look at 32 faces to form a prototype and representation of attractiveness in facial structure and appearance. Data suggest that infants have the cognitive ability to average across complex, naturalistic faces, form facial prototypes that appear familiar to them, and show preferences for these prototypical, attractive faces [5]. The ability of infants, some even less than a week from birth, to discriminate attractive from unattractive challenges the assumptions that beauty standards are a learned process through gradual exposure of cultural standards.

The Adaptive Function of Perception

The study of beauty has many facets with research clearly showing us what biological indicators account for the perception of attractiveness and the subsequent societal implications. But why does beauty matter? Why do our brains infer that attractive people are more valuable social resources than less attractive people [9]? This chapter focuses on why these preferences have come to be so prevalent in modern day society. Conventional thinking asserts that standards of beauty are a gradually learned subjective process that is a product of the media; however, research conducted over the past decades contradicts these widely held beliefs [5]. Theoretical

and empirical work has attempted to understand physical attractiveness through evolutionary models of signaling.

The evolutionary view assumes that preferences serve adaptive functions and that the external world provides information to guide biologically and socially functional behaviors [10]. If information was present about a person's value in our evolutionary past, an advantage would accrue to those who used that information, and those who used signs and signals would be able to leave more genes behind in the following generation [10]. Preferences for certain traits guide individuals to choose mates who will provide the best chance of their own genes surviving [10].

This adaptationist approach identifies adaptations and explicates the selection pressures that formed them in the evolutionary past of an organism [11]. Individuals, viewed as both signalers and perceivers, have traits leading them to respectively display or identify features that are more attractive than others, evolved as a result of having benefits [11]. Evolutionary theorists believe that these traits have been constructed through a process of phenotypic modification by natural selection for gene-propagating effects [11]. From the perceiver's aspect, physical attributes that individuals are selected to find attractive can be thought of as signs or signals of underlying qualities [11]. In essence, the signalers display signs and the receivers use cognitive and motivational capacities to recognize and act upon those signals [11]. According to this sexual selection and signaling theory, acting upon these signals equate to being attracted to another person. It has been hypothesized that certain salient features have evolved to be attractive because of the benefits, which may be material and/or genetic, that accrue to those who choose mates based upon these criteria [12]. Benefits can be both direct, whereby the perceivers directly gain for themselves and offsprings (e.g., choosing a parasite-free mate who can provide material support), and indirect, whereby the perceivers gain genetic benefits [10].

Theorists have proposed that our shared preferences for attractive facial traits are indicative of genetic fitness and stability and are adaptations to the issues that revolve around mate choice [13]. It is the fundamental assumption of evolutionary-based theories that physical attractiveness is largely a reflection of reliable cues to reproduction, health, and quality. We have evolved to not only pay attention to beautiful people but also seek them out as partners and mates.

The Animal Kingdom

Signaling and the potential for exchanges in the mating world is nothing unique to *Homo sapiens* [14]. Most nonhuman species rely on external traits, such as size, shape, and color of adornments to attract mates [10, 15]. Both avian and mammalian species show preferences for exaggerated male characteristics [15]. Male dung beetles grow large horns, the display of which attracts females and functions to defend tunnels where the females lay their eggs [14, 16]. Presumably, the female dung beetles that appear healthiest attract the males with the largest horns, maximizing the chances of reproductive success [14, 16]. Experimental plastic surgery has

shown that increasing the length of a widowbird's tail by adding feathers produces super-tailed males who enjoy more reproductive opportunities than their average-tailed competitors [17, 18]. Under evolutionary pressures of competition and selection, certain traits may grow to large sizes that need increased amounts of energy to maintain. These signaling traits are sometimes viewed as handicaps (features that impose cost to the individual) and often are more pronounced in male species given that female reproducibility is of a limited resource. A now extinct species, the Irish Elk (Fig. 3.2) had antlers that spanned 12 ft and weighed 80 lbs [16]. On initial inspection, the iridescent blue to green-colored plumage of the large peacock tail appears to have no functional significance other than attractiveness to the opposite sex [9]. It has been thought that these large ornaments and displays have been

Fig. 3.2 Irish Elk. (Photograph courtesy of "Überseemuseum Bremen 2009 250" by Sterilgutassistentin—Own work. Licensed under GPL via Wikimedia Commons—http://commons.wikimedia.org/wiki/File:%C3%9Cberseemuseum_Bremen_2009_250.JPG#mediaviewer/File:%C3%9Cberseemuseum_Bremen_2009_250.JPG)

driven by the struggle to demonstrate valuable heritable characteristics, those that are prized in males by females [16]. In a more obvious way, the cost of developing the ornaments is outweighed by the greater access of females to a prized possession, like a tunnel where females can lay eggs in the example of the dung beetle. In a more subtle way, these obvious handicaps may actually, in fact, demonstrate greater genetic fitness as the ability to overcome the handicap shows that those males must be more viable than others who are not able to essentially "waste" excess viability [11]. It is the "honesty" of advertisement that prevails, because a given increment of display costs the truly fit and healthy relatively less than their less fit sexual competitors [9]. Although not universal, across many species, more ornamented males compared with less ornamented males, have stronger immunity, reduced parasitism, and increased adult survival [19–21]. In addition, feather and skin coloration is known to influence sexual attraction in a variety of animal species, and studies on bird pigmentation have suggested that certain colors may signal immunocompetence and health [15, 22].

It is proposed that perceptions of attractiveness are species-wide, sexually selected adaptations for finding good mates [23, 24]. Features that are considered beautiful and irresistible have evolved in the animal kingdom due to sexual selection, and these preferences provide evidence for claims that human beauty mirrors these tendencies [25]. Just as large antlers, tails, and horns may reflect superior genetic fitness, certain features of humans may also have undergone selection pressures due to particular benefits and be signs of underlying quality. However, in species like humans where there is generally more equivalent expenditure of time and investment for offspring, mutual mate choices have evolved. Human cultures are characterized by mutual mate choice in which both men and women discriminate the desirability of potential mates [11]. Evolutionary psychologists have studied both the animal kingdom and humans and suggest that those human traits that are considered attractive function as markers of biologic condition, health, and reproductive potential.

The "Good Genes" Theory—Survival of Our Own Progeny

Current theoretical and empirical findings suggest that mate preferences are based on certain cues that reveal underlying quality [25]. According to the good genes theory, individuals should be attracted to one another in such a way that they are likely to pass on their own genes. The good genes explanation posits that mate preferences favor good-quality individuals due to direct and indirect benefits associated with the selection of healthy partners [26]. Ideally, individuals gain aspects of quality for their offspring by mating with attractive individuals, either by obtaining good genes or obtaining a partner that will be a good parent, or both [15, 27]. Evolutionary biologists account for infant preferences for attractive faces as a tendency to favor anatomical population averages while opposing extremes because those close to the mean are less likely to carry harmful genetic mutations [28]. Aspects of certain

physical traits, such as averageness in infant preferences, have been hypothesized to be considered attractive because in effect they are associated with individuals' health, age, and hormonal status throughout the evolutionary history. For example, in our evolutionary past, individuals may have been selected to choose mates who possessed features of physical appearance associated with pathogen resistance [29]. In support of this, human data from 29 cultures indicate that persons from geographical regions carrying greater prevalence of pathogens value a mate's physical attractiveness more than those living in areas of little pathogen incidence [29]. The authors argue that physical attractiveness cues may provide more information about the health of a prospective mate when it is more relevant, for example, in areas of higher pathogen prevalence [29]. For example, attractiveness, as assessed by symmetry, was found to be more strongly preferred by the Hadza than those in the UK, suggesting that this trait may be more important in a hunter-gatherer group given that they have much higher mortality rates from birth onward [30]. The cues that have received the most attention include sexually dimorphic characteristics, symmetry, and averageness.

Alternative theories do exist for the evolution of adaptations of attractiveness and attraction. The Fisherian sexual selection view suggests that favorable features do not correlate with fitness except in terms of attractiveness to the opposite sex [9]. Another theory, termed sensory bias, suggests that mate preference arises as an incidental effect of another preference adaptation unrelated to mating that then causes evolution in the opposite sex [9]; see Gangestad et al. for full review [11]. Although the notion that attractive features are cues to "good genes" remains somewhat controversial, most endorse this particular theory.

In most animals and humans, differential parental investment leads to different mating strategies by males and females [23]. Females have greater investment to offspring, whereas males can increase reproductive success by mating with several females; therefore, it would be expected that attractive males have more short-term mating success and attractive females have more long-term mating success than their less attractive peers [23]. This was found to be true with facial attractiveness scores correlating with the number of short-term (but not long-term) sexual partners for males and with the number of long-term (but not short-term) sexual partners for females [23]. Male body attractiveness also correlated with the number of short-term (but not long-term) sexual partners [23].

Overall, and cross-culturally, males and females place differential weight on the value of physical attractiveness, with men typically paying more attention to looks than women [9, 31–33]. In a study of 37 cultures, men valued physical attractiveness and relative youth in potential mates more so than women, whereas women were found to value cues of resource acquisition and financial capacity more so than men [32]. Males are attracted to certain traits that may be indicators of underlying health and fecundity in regards to both reproductive value (measure of future reproductive potential) and current fertility [34]. In regards to attractive traits (e.g., averageness, symmetry, sexual dimorphism), sexually dimorphic characteristics have shown the clearest associations with sexual behaviors [23]. In accordance with this, feminine female faces are consistently found to be more attractive than masculin-

ized female faces. In one study, women with more feminine faces were found to have more long-term sexual partners and also became sexually active earlier than their peers [23]. Recent research has indicated that face and body may make independent contributions to overall attractiveness [34, 35]. Although face ratings consistently are found to be the best predictor for overall ratings, this does suggest that faces and bodies may be signaling different information about potential mates [35]. It has been hypothesized that faces provide more information regarding overall reproductive value, while a woman's body conveys stronger cues to her current fertility [34]. In support of this and the good genes theory, men prioritized facial cues in long-term mating contexts, but somewhat shifted their priorities to bodily cues for short-term mates [34]. Consistent with prior research, although conditional shifts gave more focus to the body, the face was still a better predictor of overall attractiveness [34, 35].

Although preferences for female femininity have been a consistent feature of attractiveness research, preferences for masculinity in male faces vary across studies. Male face shape may provide information about hormonal status as testosterone is linked to the amount of growth of male secondary sexual characteristics like brow ridge and lower facial structures. It has been proposed that testosterone may be linked to the suppression of the immune system [36, 37], so such features considered to be attractive in males may honestly advertise quality through the ability to overcome the immunocompetence handicap. Only those in superior health condition can bear the cost of high testosterone levels and associated exaggerated secondary sexual characteristics [38]. Females are not only concerned with choosing healthy mates but also concerned with mates who will be able to provide sufficient resources to help progeny survive [12]. Therefore, preferences for certain attractive traits may have evolved because of enhanced reproductive success, either because those having these traits provide better parental care and/or they confer genetic benefits to their offspring with regards to disease resistance [39]. Interestingly and contrary to some predictions, certain groups have found a female preference for feminized male face shapes [40]. These face shapes, however, were also given the positive attributions of cooperativeness, honesty, and good parent [40]. Enhancing masculine facial characteristics increased perceived dominance with associated negative attributions, such as coldness and dishonesty, relevant to relationships and paternal investment [40]. Researchers found a greater female preference for masculinity in men's faces in Jamaica than in the UK, arguing that male facial attractiveness reflects assessment of paternal qualities as well as genetic quality. Authors argued that increased parasite load and less medical care in Jamaica led to the preference for masculinity of Jamaican women compared to British women, while also arguing that when there is more importance placed on investment, feminine male faces may be preferred [41]. In addition, analyses suggest that the extent to which women rate masculine men to be more attractive (than feminized men) is significantly greater when judging men labeled as faithful than unfaithful (Fig. 3.3) [42].

The benefits from human investment from two parents may have led to these differences and certain changes in preferences. There is evidence that women's preferences for masculine male face traits change across the menstrual cycle, indicating

Fig. 3.3 Masculinized (*left*) and feminized (*right*) male face images used in attractiveness research [42]

conditional mating strategies and that women may be more attentive to phenotypic markers of good genes during fertile phases [38]. Female respondents who were in the follicular phase (day 6–14) of the menstrual cycle were significantly more likely to prefer a masculine face than those in other parts of the cycle, providing evidence that women prefer testosterone-related facial characteristics that may indicate immunocompetence when more likely to conceive [38]. Skin coloring is also a sexually dimorphic trait, and females have been found to prefer darker photographs of male faces around ovulation [43]. Clearly a trade-off exists and shifting preferences for male faces may reflect context-specific mate choice strategies for women with a higher preference for masculine facial traits during times of high conception risk when heritable genetic benefits in offspring may be obtainable [38]. Women's preference for masculinity near ovulation has been supported by four studies in four different countries [38, 44, 45]. Supporting the notion that masculinity in male faces is an important trait relevant to reproductive mating decisions, women's preferences for masculinity in male faces were found to be highest during the reproductively active age range and lowest around puberty and postmenopause [46]. In addition, studies have shown that women prefer masculinized male faces when judging for short-term relationships than for long-term relationships and also in regards to extra-pair copulations (when women already have a partner), suggesting that these preferences are adaptations that function to obtain superior genetic quality to offspring [19, 45, 47]. These preferences are adaptive as they serve to maximize parental investment and cooperation in long-term relationships (by preferring feminine-faced males) and also maximize heritable benefits of short-term or extra-pair partners (by preferring masculinized male faces) [47]. These strategies likely fall on a continuum, the best choice reflecting a combination of maximizing heritable benefits and also parental investment.

Although complexities clearly exist in preference choice, the fundamental idea of the good genes theory is the prediction that beauty has meaning within interactions because it accurately advertises underlying quality, reproductive abilities, and health, and perceivers have evolved to prefer certain individuals for their healthy status.

Cues to Health and Fertility

The Perception of Health

Evolutionary psychology suggests that certain features including facial and body attractiveness may provide information regarding underlying health and fertility. Research has shown that facially attractive people are perceived to be healthier [26, 48]. Men were found to judge women with more beautiful faces as more fertile and less likely to experience medical problems [49, 50]. In an investigation looking at high school yearbook photographs from the 1920s, facial attractiveness was found to predict future longevity, with males' ratings of attractiveness more predictive than females' [12]. Interestingly, although attractiveness and health were significantly correlated with each other, judges' ratings of perceived health were unrelated to the photographed subjects' actual health [12]. In one of the most comprehensive studies using lifetime health records, although adolescent facial attractiveness was found to be unrelated to adolescent health for either males or females and not predictive of health at any stage of life, more attractive persons were perceived and rated as healthier by their peers [51].

Health perception also appears to be related to particular facial traits, including facial color and texture. One study examined the relationship between ratings of health from small skin patches to overall attractiveness of whole face images and found that apparent health of facial skin is positively related to male facial attractiveness [52]. Skin health as measured by color and texture may be a particularly useful marker of current health as it is more changeable than other aspects of attractiveness [10]. Investigations studying the particular attractive facial traits of averageness and symmetry have shown associations with perceived health [39, 53]. Increases in both averageness and symmetry were associated with an increase in perceived health; in addition, facial distinctiveness (a converse measure of averageness) was associated with poor childhood health in males and poor current and adolescent health in females [39]. A study showed that increasing symmetry improved ratings of apparent health and attractiveness (Fig. 3.4), while further suggesting that facial symmetry and attractiveness is mediated by judgments of apparent health [26].

Other bodily traits have also been studied, such as the waist-to-hip (WHR) ratio. In one study, college-age men were found to rate female figures with low WHR

Fig. 3.4 Normal (*left*) and more symmetrical version (*right*) of a face used in attractiveness research [26]

as more attractive, healthier, and of greater reproductive value than figures with a higher WHR [54].

Actual Health

Facial attractiveness, averageness, symmetry, and male face masculinity have been found to provide cues to actual health, especially for those in the lower distributions of these facial qualities [39, 55, 56]. Facial attractiveness in women and body attractiveness in men have also been associated with physical fitness [57, 58]. The link does appear to be quite complex as studies using the same set of images have found no correlation between adolescent facial attractiveness and health [51]; positive association between male facial masculinity, but not female femininity, and health [56]; and positive association between female, but not male, facial averageness and health [39].

As shown in the previous chapter, symmetry is highly associated with attractiveness. The ability to develop successfully and symmetrically through environmental pressures is one proposed indicators of genetic quality [10]. Fluctuating asymmetry (FA) is believed to index developmental instability and thus, is thought to serve as a marker of biologic quality and underlying genetic, hormonal, and developmental health of individuals. FA is described as the random deviation from perfect bilateral symmetry in morphological traits that is produced by genetic or environmental stressors during embryonic development [13, 59]. This is distinguished from directional asymmetry, which refers to population-wide but directionally constant asymmetry (e.g., left-sided position of the heart), and antisymmetry, which refers to population-wide directionally varied asymmetry (e.g., direction of the human hair whorl spin) [60]. In a large meta-analysis, a significant negative relationship was found between FA and mating success and attractiveness [61]. FA increases with exposure to genetic perturbations such as inbreeding, deleterious recessive alleles, homozygosity, hybridization of genetically distinct populations, and chromosomal abnormalities [62]. Increases in body FA have also been associated with parasite load, poor nutrition, pollution, premature birth, and mental retardation [63–65]. Measured male facial masculinity was found to correlate positively with developmental stability as measured by facial asymmetry and body FA [66]. Another study has illustrated that facial FA, or better put lack thereof, may also signal psychological, emotional, and physiological well-being [59]. Men whose faces were horizontally asymmetrical were more depressed and emotionally labile [59]; however, these results have been debated, suggesting that the findings may have resulted from type 1 statistical errors [67]. Another study showed that for both facial asymmetry and body FA, significant possible associations were seen in the number and duration of respiratory infections [19]. Although FA is hypothesized to be a biomarker of an individual's health and fitness, several investigations searching for a sound relationship have produced mixed results [68, 69]. Overall, however, the consensus is that attractiveness is positively related to the degree to which humans

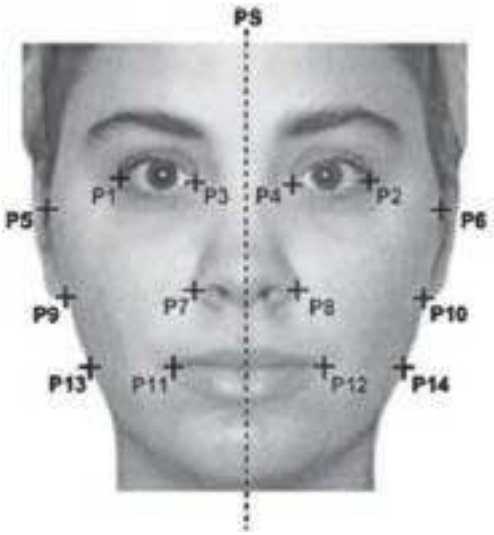

Fig. 3.5 Example of landmarks used for measurement of facial traits. *Vertical dotted line* shows the plane of symmetry [27]

are able to cope with developmental stressors as assessed by FA (Fig. 3.5) [27]. In fact, facial asymmetries and marked deviations from averageness occur in several chromosomal disorders and provide further support for the implications of the more subtle deviations encountered in the general population [62]. Recent studies support the link between averageness, attractiveness, and genetic diversity in terms of heterozygosity in the major histocompatibility complex (MHC) genes that code for proteins involved in immune response, supporting the hypothesis that those with more average features have genotypes that are less likely to be homozygous for deleterious alleles and less likely to carry harmful genetic mutations [70, 71]. Other authors reported that patches of skin from cheeks of men who were heterozygous at three loci in the MHC positively correlated with health and attractiveness measures [70]. Mixed-ethnicity face shapes, indicating genetic diversity, have been found to be more attractive than single-ethnicity face shape among Europeans, Africans, and Asian backgrounds [72–74]. Heterozygosity can signal an outbred individual with greater genetic diversity, greater resistance to parasites, and fewer harmful mutations.

In regards to sexually dimorphic characteristics, masculine male faces were found to honestly advertise rated and actual health during adolescence [39, 56]. Another study found that men's facial masculinity correlated negatively and women's positively with respiratory disease number and duration (but not intestinal infections), supporting the notion that this facial cue correlates with actual health [19]. In a more detailed study of specific measures of health, attractive participants displayed greater cardiovascular health and complained less often of a headache or runny nose over a 1-month study period [49]. In addition, two large meta-analyses have found a weak link between mental health and facial attractiveness [39, 75, 76].

In summary, facial attractiveness and some of its components, the most widely studied being averageness, symmetry, and sexual dimorphism, may have modest associations with health. Meta-analyses suggest a weak association of attractiveness with mental health and a moderate association with physical health [77]. The best lifetime health data showed no significant relationship; however, a reanalysis of this data found a moderate association between attractiveness at 17 years of age and later health for faces below the median in attractiveness [51, 55]. In addition, attractiveness in a mate appears to be more valued in societies with high parasitism and poor health [29]. The link may be the strongest when stress is the greatest, with unattractive deviations associated with chromosomal disorders and associations often limited to faces below the median of attractiveness [77]. Overall, these studies are quite limited as health has not been measured well and subjective and unvalidated self-report measures are often used [77].

Beauty, Hormonal Status, and Reproductive Success

The association between female beauty and reproductive success has been greatly studied. It has even been shown that facial attractiveness correlates with the number of children in a hunter and gatherer society [78]. Positive correlations have been observed between circulating gonadal hormones (late follicular estrogen) and ratings of femininity, health, and attractiveness [79]. Although more difficult to study in modern industrialized society where family planning and hormonal contraception are widespread, there is evidence that physical attractiveness may be associated with reproductive success; however, one study showed nonlinearity in these findings and another failed to show an association between attractiveness and number of offspring in a modern European society [80, 81]. In a more recent study, evaluating women and reproductive success, among those who had never used hormonal contraceptives, attractive women were found to have more biological offspring than less attractive women, which was not affected by sociodemographic variables including age, years of marriage, and income [82]. Postmenopausal faces corresponding to high reproductive success showed more feminine features, supporting the notion that facial attractiveness predicts reproductive success [82]. These sexually dimorphic proportions, considered to be hormone markers, not only affect attractiveness judgments but also act as honest cues to fertility and health [83]. In regards to other traits, FA as assessed in different body parts has also been associated with health and fertility. Women who were more symmetrical, as assessed by the degree of inequality in the fourth-digit length of the right and left hands, were found to have healthier reproductive physiology, having 13 % higher average levels of estradiol over the menstrual cycle than less symmetric women, which is associated with a higher probability of conception [68]. In addition, one study found that more symmetrical men, as assessed by digit FA, had higher sperm number per ejaculate and greater sperm speed [84]. In regards to males, in one study, facial attractiveness ratings of men's faces were found to significantly and positively correlate with the

basic sperm parameters of motility and morphology but not concentration [85]. This supports the good genes theory with highly attractive faces corresponding to higher quality sperm samples [85]. Overall, these studies suggest that fertility behavior of modern humans may still be somewhat under the influence of evolved psychological adaptations even with modern society availability of family planning, contraception, and makeup products to enhance looks [80].

The most convincing evidence comes from the analyses of the low, attractive WHR being correlated with youthfulness, reproductive endocrine status, and long-term health risk in women. As assessed by precise measurements of daily levels of 17-beta-estradiol and progesterone, those with relatively low WHR were found to have higher fecundity [86]. Nonobese women of reproductive age who suffer from polycystic ovarian syndrome and have an elevated testosterone level, have male-like higher WHR and decreased fertility [54, 87]. Women with unusually high WHRs have greater difficulty conceiving than women with sex-typical WHRs [34, 54]. In two large studies of in vitro fertilization, WHR was found to be the best predictor of pregnancy rate among tested variables, including BMI and age, with lower WHR women having about double the pregnancy rate as higher WHR women [88, 89]. During pregnancy, a woman's WHR increases progressively, exceeding 1, clearly indicating that she is incapable of a new conception. Body attractiveness is clearly important, and attractively rated WHR is not only perceived as healthier but is in fact healthier and more fertile.

Boundaries of Beauty

Human beauty standards reflect our distant and recent evolutionary past and emphasize the role of health assessment in mate choice. Evolutionary theories have proved to be powerful tools in exploring the fundamentals of beauty ideals. Ingrained in our biology appears to lie tenets of beauty that are associated with evolutionary relevant advantages for choosing mates. Results are overall somewhat mixed; however, they do suggest a general association of attractiveness with physical health, mental health, and reproductive success [75, 76].

Beauty is also vulnerable to deception, and humans have found innumerable ways of modifying their faces and bodies [11]. With the development of cosmetics and plastic surgery, human beauty can be acquired in both a temporary and permanent state [25]. From diet, clothing, and makeup to invasive surgery, men and women alike report using various techniques of appearance enhancement for attracting and retaining mates [11]. Even more purposeful, commercializing the sale of ova to generate better-looking children was attempted through the Internet in the early 2000s by creating an auction of ova from a set of photographed models [14].

A fourth-century B.C. Greek historian, Xenophon, wrote about the cosmetic deception of a new bride, and another Greek theologian introduced legislation to prevent women from misleading husbands into marriage by means of cosmetics [90]. More recently, a Chinese man divorced and sued his ex-wife for giving birth to what

Fig. 3.6 Man sues wife over ugly children. Before (*left*) and after (*right*) plastic surgery photographs. (http://www.yahalavoice.com/man-sues-wife-over-ugly-children/)

he deemed to be an "extremely ugly" baby girl. Before the couple met, the ex-wife had undergone approximately $ 100,000 worth of cosmetic surgery in South Korea (Fig. 3.6). The accuser sued his ex-wife on the grounds of false pretenses for not informing him about the nonheritable surgery, tricking him to think that she was beautiful. A judge agreed and ordered the ex-wife to pay $ 120,000 to the plaintiff [91].

Beauty is clearly not a simple construct and attractiveness appears to be ingrained in our current biology through our evolutionary past. Although many aspects of perception appear innate, other aspects appear to be influenced by context, experience, and individualized differences.

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Chapter 4
Subjective Aspects of Beauty

Neelam A. Vashi and Ellinor R. Quay

"Beauty is in the Eye of the Beholder"

Much of the attractiveness research assumes that attractiveness is judged on the basis of physical characteristics that are independent of surrounding information. However, except in certain applications that are by their nature limited, such as print media, people typically have much more information about those whom they may or may not find beautiful [1]. Moreover, although scientific research suggests that these physical cues can serve as universal criteria for beauty, the perception of what is beautiful remains, at least in part, particular to the perceiver. Although we may view general categories or ranks of attractiveness similarly, individual differences do exist as not all people find the exact same face to be the most beautiful. Writer Margaret Wolfe Hungerford's famous phrase that "beauty is in the eye of the beholder" is a testament to this notion that attractiveness is subjective [2–4]. The famous philosopher David Hume agreed, noting that "beauty is no quality in things themselves: it exists merely in the mind which contemplates them; and each mind contemplates a different beauty" [2, 5]. Many factors can influence a person's aesthetic judgments, including his or her emotional state, appeal to social status or financial interest, and educational, cultural, or economic background [6]. These individual differences and preferences are generally consistent with evolutionary theory [2]. As evidenced by the prior chapter, evolutionary theory has proved to be a powerful tool in exploring human facial attractiveness. The concept of beauty appears to be ingrained in our biology with evolutionarily relevant advantages for

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choosing individuals perceived as attractive. In this chapter, we will explore how human beauty can vary as a function of personality and context, fluctuate with the tastes of society and culture, and shift with the bias of historical periods or the mass media.

"What Is Good Is Beautiful"

Beauty is as much a product of non-static physical features, such as body position and facial expression, as the static physical features that have traditionally been used to define it. These attributes can indicate the underlying qualities of a person. Personality traits, such as kindness, sense of humor, and intelligence, may impact the way we gauge attractiveness while interacting with others. The influence of personality, facial expression, and gaze elicits a new way to interpret the phrase and stereotype "what is beautiful is good" as discussed in Chap. 1 [7]. Physical attractiveness is usually thought of as a function of static physical features such as facial symmetry and sexually dimorphic characteristics. Dynamic features also have important effects, and information garnered from repeated interaction can favorably or unfavorably change perceptions of individuals' physical attractiveness [8, 9]. Studies have shown that explicit knowledge about a person's personality and character can influence attraction [10, 11]. In one study, undergraduates read favorable, average, or unfavorable personality descriptions attached to a pre-rated attractive, average, or unattractive photograph of a female. More favorably described persons were rated as more physically attractive, with this trend evident for each of the three levels of pre-rated attractiveness [12]. In another study, a desire for some personality traits influenced judgments of facial attractiveness. Individuals valuing particular personality traits (i.e., warmth, easy-goingness, assertiveness) found faces appearing to display these traits attractive [13]. Recently, Jonason et al. demonstrated that women valued sincerity, ambitiousness, and kindness in long-term mates [14]. In fact, personality traits are reported to be among the most important factors in choosing a partner by both sexes cross-culturally [15, 16].

Among faces with equivalent features at rest, those with more positive expressions are judged to be more attractive [17–20]. These findings have even been found when rating infants for cuteness. Results from these infant studies indicated that although general facial configuration was more important than expression, photographs depicting more positive facial expressions received higher cuteness ratings [21]. Those who smile more are often perceived as more attractive. Smiling has been found to enhance attractiveness ratings independent of its form (closed smile, upper smile, or broad smile) [22]. In one study, undergraduate students were shown photographs of individuals with a neutral facial expression and with a smile [19]. The students rated the attractiveness of smiling individuals higher and perceived in them greater capacities for sincerity, sociability, and competence. In another study, over 200 undergraduate students were asked to assess the attractiveness of 15 subjects, each posing with three different facial expressions of neutral, happy, and sad.

The experiment found that individuals appeared less physically attractive when their facial expressions were sad than when happy or neutral [18].

In addition to smiling, direction of gaze can influence attractiveness ranking. Faces with a direct gaze are preferred over faces with averted gazes [23–25]. Indeed, individuals with direct gazes are associated with the quality of "openness" [23]. One study found that expression differentially qualifies the strength of attractiveness for faces with direct and averted gaze [24]. In the study, 269 men and women were asked to rank pairs of female prototypes that represented four different conditions: (a) a neutral expression with a direct gaze; (b) a neutral expression with an averted gaze; (c) a smiling expression with a direct gaze; and (d) a smiling expression with an averted gaze. For faces with a direct gaze, attractiveness rankings were higher for smiling expressions over neutral expressions. In contrast, for faces with an averted gaze, neutral expressions were judged as more attractive than smiling expressions. Another study demonstrated a similar phenomenon [25]. Participants in that study demonstrated preferences for front views of faces over three-quarter views of faces when judging the attractiveness of happy, relatively physically attractive individuals, but they demonstrated no such preference when judging the attractiveness of relatively unattractive individuals or those with disgusted expressions. Thus, the interplay between these non-static physical cues of gaze and expression influence attractiveness rankings. Facial cues of physical attractiveness are stronger when the depicted individuals appear to be interested in the viewer than when relatively disinterested.

Neuroimaging studies of the brain corroborate these findings. The perception of attractiveness has been correlated with activity in the ventral striatum, a brain area associated with reward function and circuitry [26]. Studies have found that certain activity in the brain is increased when an individual has received direct eye contact or a smile as compared to an averted gaze or neutral expression [23, 27]. Researchers used event-related functional magnetic resonance imaging (fMRI) to investigate brain regions that respond to attractive faces that manifested either a neutral or mildly happy face expression [27]. Attractive faces produced activation of the medial orbitofrontal cortex (OFC), a region involved in stimulus-reward value. Responses in this region were further enhanced by a smiling facial expression, suggesting that the reward value of an attractive face as signified by medial OFC activity is modified by a smile directed at the perceiver. This suggests that the reward value of an attractive face is greater when this face demonstrates positive social interest in the viewer. Preferences for attractive individuals who appear willing to reciprocate in social interaction may promote efficient allocation of effort.

Moderating Effects of Contextual and Conditional Factors

Much of the effort of the scientific community to delineate universal criteria for beauty relies on the assumption that attractiveness is judged by physical characteristics alone. However, an evaluator of beauty will often have much more informa-

tion about a target than appearance and can take that information into account when assessing beauty [1]. This information may come in the form of social context such as reputation, relationship histories, and family background. Characteristics of the perceiver, such as gender, age, or self-perception, can also influence judgment. Finally, the length of the relationship sought or temporal context can modulate what is perceived as attractive. In the next section, we will discuss how social context, perceiver-related traits, and temporal context contribute to variation in individual standards of beauty.

Social Context

Information regarding another person can alter attractiveness judgments. One study showed that socio-economic status was the best predictor of male facial attractiveness, even when effects of symmetry were removed [28]. A woman's knowledge of a man's behavior, good or bad, influences the perceived cost of preferring masculinity. A study found that women reported a significantly stronger attraction to masculine men over feminine men when judging men with reputations for fidelity as opposed to infidelity on a hypothetical date [11]. Thus, masculinity was found to be more attractive if linked to fidelity, implying that a man's social reputation can influence attraction. In addition, images of men labeled as married were found to be more attractive than those labeled as single [29]. Women also preferred images of men who had previously been paired with smiling women [30]. This modification of preference by the attitudes of other women illustrates the importance of social transmission on the judgment of beauty [31].

The notion that characteristics indicating valuable mate potential can underlie perceptions of attractiveness is supported by studies that examine judgments of beauty made by men and women in established romantic relationships. For example, research has found that men and women involved in heterosexual romantic relationships tend to rate the attractiveness of the opposite sex lower than single men and women [32–34]. Another study showed that romantically involved participants demonstrated a less attractive memory for a previously encountered mate's face as compared to single (or romantically uninvolved) individuals [35]. Furthermore, an individual's perceptions of their partner's attractiveness was found to be more positive than their partner's self-perception of physical attractiveness in one study [36]. It may be possible, then, that individuals involved in romantic relationships reflexively devalue and overvalue attractiveness to guard against temptation and to preserve the relationship with an established mate. Studies have also suggested that attractiveness judgments serve as natural backstops against inbreeding while promoting prosocial behavior towards own-sex relatives [37]. Participants in one study judged self-resemblance to be more attractive in the context of same-sex faces but not in the context of opposite-sex faces, supporting the notion that

self-resemblance is attractive in a prosocial context and less attractive in a mating context [37].

Perceptions of beauty may also vary from person to person within a culture based on local upbringing and family influence. One study found that agreement between pairs of spouses, siblings, or close friends upon ratings of facial attractiveness was significantly greater than between pairs of strangers drawn from the same race and culture [38]. This finding suggests that such preferences may be socially organized rather than purely objective or even cultural. This existence of a social influence on the perception of beauty is buttressed by evidence that familiarity with a face is correlated with increased perception of attractiveness. Considerable research demonstrates that people do prefer familiarity, which can be considered as a form of classic conditioning [39–42]. Researchers showed that both general familiarity and episodic familiarity, or increased exposure to faces, increased ratings of attractiveness among students and staff at Trinity College in Dublin, Ireland [43]. In another study, subjects preferred their own mirror images while close friends preferred the true image, reflecting preference for the image that was most familiar to each group respectively [44].

Perceiver-Related Traits

Characteristics of the perceiver can be influential in judgments of beauty. The gender of the perceiver [45] and a similarity of attitudes between the perceiver and target [46] can influence attractiveness judgments. The age of the perceiver has also been shown to influence perceptions of attractiveness. In a recent study, young and middle-aged adults ranked younger faces as more attractive than older faces, while older aged adults rated all faces equally [47]. One biological explanation for this shift is that older adults are no longer evaluating others as possible mates for procreation, so the perceived youthfulness of a face does not sway their judgment. In another study, children of older parents were less influenced by youth in a potential partner than were offspring of younger parents [48].

Women's perception of their own beauty influences their preference for attractiveness of their male counterparts. In one study, women who regarded themselves as attractive showed a greater preference for masculinity and symmetry in male faces than women who rated themselves as less attractive [49]. Women with low and average self-rated attractiveness did not have significant preferences for masculinity and facial symmetry. A possible explanation for this phenomenon may be that women of high mate value are more attracted to signals of good genes as they are better able to extract investment from high quality mates or, more specifically, to reduce the likelihood of infidelity and lower paternal investment that may be associated with such mates. In a laboratory setting, women who viewed a slideshow of highly attractive women reported lower self-rated attractiveness and had weaker

preferences for masculine characteristics in male faces than did women who viewed a slideshow of unattractive women [50]. These findings suggest that women go through a series of recalibrations of their own attractiveness and mate preferences after viewing certain stimuli to incorporate new impressions of their own value in terms of attractiveness [31].

By a similar measure, men's perception of female attractiveness can be influenced by their own self-rated attractiveness. For example, one study showed that men who rated themselves as lower in desirability were less discriminatory in their ratings of female attractiveness [51]. Analogous to findings that women who think that they are attractive are choosier, Hadza men who were perceived as better hunters and as more attractive in a hunter-gather society showed the strongest preferences for symmetry in female faces [52].

Women's hormonal cycle has also been found to influence their judgment of male attractiveness. Women in the most fertile phase of their menstrual cycle have been found to prefer a masculinized face [53, 54]. The studies suggest that women are more attentive to masculinity, a signal of good genes, when conception is most likely.

Temporal Contexts

Numerous studies have found that women situationally change their desire for masculinity in male faces depending on the anticipated length of the relationship. Studies have shown that the time span of a relationship (i.e., short-term versus long-term) that a woman seeks can influence her attraction to varying degrees of masculinity [55, 56]. In one study, women found men with more masculine features to be more attractive when contemplating a short-term relationship [55]. Masculine features have been linked to perceptions of immunocompetence and the accompanying "good genes" to pass to offspring. However, women have also been shown to associate men with more masculine features with negative attributes such as dishonesty and tendency towards infidelity, qualities incongruent with monogamous relationships and paternal investment [57]. The results of this study suggest that the prospect of a relationship with a more masculine man becomes more palatable for a woman if the relationship is intended to be short-term, and she is able to acquire "good genes" for offspring.

Historical Influences

The concept of human beauty has fluctuated drastically over time. In ancient times, eyebrows that met above the nose were ideal. Egyptians and Greeks used kohl pencils to connect the brows when a naturally occurring unibrow had not formed

Fig. 4.1 Ancient Egyptians used kohl pencil to enhance their eyebrows. (Ancient Egyptian women wearing kohl, 1420−1375 BC. Mural in a tomb in Thebes. Image courtesy of 10,000 Meisterwerke der Malerei, a compilation by The Yorck Project provided by Directmedia; available at https://en.wikipedia.org/wiki/Kohl_(cosmetics))

(Fig. 4.1) [58]. In fifteenth century Northern Europe, upper-class women attempted to make their foreheads appear higher by manual removal of the hairline (Fig. 4.2). During this same time, blond hair was considered to be a sign of beauty, with both men and women attempting to make their hair lighter by using bleach, dyes, or crownless hats under the sun. In sixteenth century England, women tried to copy Queen Elizabeth's pale complexion (Fig. 4.3). The attempt to create this pallor was often with the use of ceruse or white lead, which was later discovered to be poisonous [59]. Peter Paul Rubens' *Venus at the mirror*, painted in the seventeenth century, illustrates the appeal of a voluptuous woman during a time when larger women were considered goddesses (Fig. 4.4).

A review of popular images of the female body in Western culture over the course of the twentieth century provides an excellent example of evolution of popular norms of beauty [60]. Beginning in 1890 and into the early 1900s, the Gibson girl, created by illustrator Charles Dana Gibson, personified the ideal of feminine

Fig. 4.2 European upper-class women in the fifteenth century attempted to make their foreheads appear higher by manual removal of the hairline. (Rogier van der Weyden, Portrait of a Lady, 1460. Oil on panel, 34×25.5 cm. Image courtesy of National Gallery of Art, Washington, D.C.; available at https://en.wikipedia.org/wiki/Portrait_of_a_Lady_(van_der_Weyden))

beauty [60]. The Gibson girl was slender and tall, with a voluptuous bust and wide hips accentuated by a cinched waistline and corseted torso (Fig. 4.5). After World War I, at the onset of the "roaring" 1920's, the flapper silhouette became popular—a flat-busted, curveless, and boylike figure (Fig. 4.6). The flapper phenomenon ended with the Great Depression, when the desire for more feminine sexual characteristics, such as bustiness, returned, and big-breasted cinema stars, such as Mae West and Greta Garbo, became sex symbols. During the World War II, as the hemlines of skirts continued to shorten and high heels came into fashion, the legs joined the breasts as symbols of beauty and eroticism. Popular pinups in World War II depicted models with hemmed stockings, garters, and high heels capping seemingly endless legs. Post-World War II, the 1950's Hollywood and fashion industry perpetuated this voluptuous ideal of beauty with the assiduously produced hourglass look of big-studio starlets like Marilyn Monroe. During the "sexual revolution" of the 1960s, this voluptuous look gave way to a thin and androgynous figure that closely resembled the ideal of the 1920s. A 97-pound English model nicknamed "Twiggy," with a minimal chest and short hair, embodied this newly evolved ideal body shape.

Fig. 4.3 Women in sixteenth century England covered their faces with ceruse to recreate Queen Elizabeth's pallor. Ceruse was later discovered to be poisonous. (Unknown painter, Coronation portrait of Queen Elizabeth I of England, 1600–1610. Oil on panel, 127.3 × 99.7 cm. Image courtesy of the National Portrait Gallery, London; available at https://en.wikipedia.org/wiki/Venetian_ceruse)

Svelte became à la mode: studies of Miss America pageant contestants and Playboy centerfolds from 1960 to 1978 depict a significant downward trend in average body weight over the 2 decades [61]. Although physically fit "hard-bodies" were briefly idealized in the 1980s, the waif look in the 1990s became popular again, especially in the world of high fashion typified by models such as Kate Moss. This thin trend continued and persists today in fashion and in much of Hollywood.

Cultural Influences

Although beauty has an evolutionary basis, the importance of local conditions and cultural transmission can affect its perception. Ethnic groups differ on many innate morphological features such as the shape of the nose and eyes. They also differ based on acquired and culturally determined features such as ornamentation, hairstyle, and face alteration [62]. Although certain acquired features may be quite

Fig. 4.4 In the seventeenth century, larger women were considered goddesses. (Peter Paul Rubens, Venus at a mirror, 1615. Oil on canvas, 124.5 × 105.5 cm. Image courtesy of the Liechtenstein, The Princely Collections, Vaduz-Vienna; available at http://en.wikipedia.org/wiki/Venus_with_a_Mirror)

Fig. 4.5 At the turn of the twentieth century, the illustrator, Charles Dana Gibson, personified the ideals of feminine beauty in his drawings. The Gibson girl was slender and tall with a voluptuous bust and wide hips accentuated by a cinched waistline and corseted torso. (Charles Dana Gibson, "Gibson Girls," circa 1900. Engraving after original drawing, titled Picturesque America, Anywhere Along the Coast, original drawing dated 1898. Image available at http://en.wikipedia.org/wiki/Gibson_Girl)

Fig. 4.6 In the 1920's, the flat-busted, curveless, and boylike figure of the flapper became popular. (Actress Alice Joyce, February 1, 1926. Press photograph from the George Grantham Bain collection. Image courtesy of United States Library of Congress; available at http://en.wikipedia.org/wiki/Flapper)

unappealing to an outsider, these culturally determined attributes often play an important role in group membership and status within a given society [62]. Body ornamentation is culture specific. In African tribes, a lower lip plate can be seen combined with the removal of the two lower front teeth (Fig. 4.7). When a tribal chief was once asked the reason for them, he answered: "For beauty! They are the only beautiful things women have; men have beards, women have none. What kind of person would she be without this? She would not be a woman at all." [63]. In the Kayan Tribe in Thailand, the elongation of a woman's neck is considered beautiful (Fig. 4.8).

In 1874, Charles Darwin performed a rudimentary cross-cultural study and found that men use widely varying criteria to judge attractiveness in women. His conclusion was that there was no single standard of beauty with respect to the human body [63]. While research since the time of Darwin strongly suggests that there are universal standards to beauty, as outlined in the previous chapters, there may still

Fig. 4.7 Beauty ideals fluctuate across cultures. Body ornamentation is culture specific. In the Mursi tribe in Ethiopia, women place a plate in their lower lip and excise their two lower front teeth. (Mursi woman and her baby in Mago National Park, Ethiopia, November 12, 2012. Photograph courtesy of Bernard Gagnon; available at http://en.wikipedia.org/wiki/Lip_plate)

be some truth to Darwin's initial assertion. Perceptions of human beauty do vary slightly from culture to culture. Studies have shown that male preferences for female body fat, female preferences for male facial masculinity, and even the relative importance of pleasing facial features over bodily features differ across cultures. In a recent study, computerized images of a model's face were generated with the ability to alter certain characteristics, namely nose shape and the projection of the lips and chin [64]. These modifiable images were sent to more than 13,000 plastic surgeons and laypeople in 50 different countries who were then able to virtually create a face that they felt to be the aesthetic ideal. Ideal facial configurations were found to be highly dependent on the individual's cultural and ethnic background, providing evidence that ethnic, demographic, and occupational factors significantly impact a person's perception of beauty [64].

Historically, studies have perpetuated the notion that low waist-to-hip ratio (WHR) is a reliable marker of beauty and indicator of mate preference [62]. However, these studies draw their data largely from subjects in industrialized nations. Certain foraging societies have been shown to disregard low WHR in preference for heavier set women. Men of the Matsigenka of Peru and the Hadza of Tanzania, cultures that practice swidden agriculture (a physically demanding form of subsistence

Fig. 4.8 In the Kayan tribe in Thailand, women wear neck rings. The elongation of the woman's neck is considered beautiful. (A Kayan woman in Thailand displaying her neck rings. Photograph courtesy of Steve Evans; available at http://en.wikipedia.org/wiki/Neck_ring)

farming) and that are largely isolated from Western culture, give overall consideration to general size rather than ratio, preferring heavier women when expressing preference for mates [65, 66]. The Shiwiar forager-horticulturalist men of Ecuadorian Amazonia use both WHR and body weight in assessments of female attractiveness, also preferring higher body fat women [67]. In fact, the majority of the world's cultures have perpetuated ideals of feminine beauty that include plumper women [68]. This is in contrast to Western societies where thinness is valued. Although a low WHR is a better predictor of women's attractiveness, in a US sample, thinness was so highly valued that 24 % of women and 17 % of men reported to be willing to give up 3 years of their lives to be thinner [69]. In the USA, women and men seek out ways beyond weight loss to decrease fat and cellulite including liposuction, cryolipolysis, ultrasound, laser-assisted lipolysis, radiofrequency, and topical herbs [70]. An explanation for this discrepancy between foraging societies and more industrialized western societies is that body fat is attractive in societies in which food resources are limited and not storable [71].

Female preference for masculine facial features also differs across cultures. In Jamaica, where infectious disease is prevalent and male parental investment is often less pronounced than in other countries, researchers found a greater female pref-

erence for masculine facial features than in the UK [72]. In this study, Jamaican and British participants were presented with masculinized and feminized digital representations of male and female faces. In contrary to the British counterparts, Jamaican women consistently preferred more masculine faces.

The relative importance placed on the maintenance and presentation of the face and the body varies significantly across cultures. In one study, researchers compared advertisements for beauty products in Taiwan, Singapore, and the USA, and they found that advertisements directed at the improvement of women's hair, skin, and face occupied the greatest proportion of ad space in Singapore (40 %) and Taiwan (49 %), while clothing advertisements occupied the largest proportion of ad space in the USA (54 %) [73]. The study also found more frequent instances of sexualized beauty present in US advertisements than in those of the East Asian countries. Even within the USA, Asian American culture may be more focused on the face than body. The various types of cosmetic surgery sought in the USA appear to be racially and ethnically focused [74]: Asian American women more often request "double eyelid surgery" whereas European American women comparatively prefer body-sculpting surgery such as breast augmentation and liposuction. Clearly, cultures will evolve differently and preferences may become selected for based on conscious and unconscious strategies [72].

Impact of the Mass Media and Globalization

Perceptions of attractiveness may also reflect societal ideals dictated by the apparent preferences of the mass media and fashion industry [75]. Englis et al. argue that advertising agencies and fashion and beauty editors act as cultural "gatekeepers" who, by virtue of their influence over product promotion, clothing design, and casting, shape the ideals of beauty that will be adopted by the society that serves as their audience [76]. Carefully staged images of men and women, often airbrushed or even computer generated, become icons of beauty which in turn act as powerful ideals for consumers. In this way, the media creates false and adjusted beauty standards. When men were exposed to extremely attractive stimuli (television show with three strikingly attractive females) in both a field study and laboratory setting, they later rated an average female as significantly less attractive than did a comparable control group [77]. In western societies, the continuing presentation of ultra-thin models can lead to the adoption of this beauty ideal. In a study investigating how perceptual experience modulates body aesthetic appreciation, although thin bodies received higher "liking" judgments than round bodies overall, a very brief exposure to rounder bodies lessened this strongly polarized preference [78].

Unachievable ideals of beauty are at least becoming more diverse. Although it may be possible to choose a woman who personified beauty during a point when Western society was dominated by certain ideals—Marilyn Monroe in the 1950s or Twiggy in the 1960s (refer to Historical influences)—Western society today is more inclusive and mass media has become more fragmented as it targets a wider

range of ethnicities and cultures. In the music industry, enormously popular pop and rhythm and blues artists, such as Beyonce Knowles, Taylor Swift, and Shakira, whose music is synonymous with their sex appeal, demonstrate this phenomenon. Barbie® dolls, paragons of beauty for generations of young girls and historically dominated by purely Caucasian ideals, are now sold in variations of skin, hair color, and facial features.

However, while fractionation and the increasing reach of the mass media may have expanded our notion of beauty, its broad reach and influence may have also imposed more uniform standards of beauty than previously existed. Western influence on the ideal Japanese woman's eye shape provides an apt example. A study examining Bijin-ga portraits, or Japanese portraits of beautiful women, compared differences in the eye shapes and sizes of women in the Meiji Period (1868–1912) and modern day Japan (after World War II) to find significant differences in the eyes that trend toward Western ideals [79]. This may, in part, explain the beauty ideals in today's Asian American culture; the cosmetic surgery most often requested by Asian Americans is "double eyelid surgery" [74].

Beauty as a Complex Construct

The concept of beauty is complex. The perception of what is beautiful changes depending on the individual, society, or historical period. Personality, relationships, culture, and media shape beauty standards to create individualized ideals. Although physical characteristics of beauty may be innate, other aspects are influenced by particular conditions, experiences, and surroundings. According to one author, any person can increase his or her attractiveness by maintaining good eye contact, acting upbeat, and dressing well [80]. Despite the breadth of scientific research that has sought to standardize beauty, we acknowledge that Darwin was right as much as he was wrong; there is no precise recipe for beauty [63, 81]. The judgment for what is beautiful is, at least in part, subjective. Hungerford's famous phrase "beauty is in the eye of the beholder" continues to ring true. However, what happens to the evaluation of beauty when the beholder is also the target? This is, in effect, the paradigm for body image. The factors that influence our body image and promote body image dissatisfaction are the subjects of the next chapter.

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Chapter 5
Body Image and Body Image Dissatisfaction

Elizabeth M. Damstetter and Neelam A. Vashi

Introduction: Conceptualizing Self and Body Image

The concept of self and body image has been explored to great depths in the psychological and medical literature. It is broadly defined as "an internal mental representation of the bodily self [1]." That is to say, the body image is formulated by one's collective cognitive and emotional experiences relating to the perceptive awareness of one's body in relation to its physical environment, and it is ever changing in the face of new sensory inputs. The body image is, therefore, a phenomenon of a lifetime of ongoing subjective experiences, including memories and emotions that combine with tangible sensory data that are unique to the individual within a broader social and cultural context [2, 3].

It is proposed that the hypothetical body image is demonstrably influenced by the prejudices, expectations, and beliefs of the individual in addition to societal and cultural standards of desirable body features. Indeed, a multitude of external influences and information—including family, peers, and the media—may combine and become internalized into an individual's measurement of the ideal body form. Body image is manifestly linked to an individual's emotional state, and such emotions are often evoked by one's self-judgment of his or her image in comparison to this ideal. In this way, one's body image functions as a component of the broader self-image. Any degree of dissonance between one's self-image and his or her ideal may lead

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to body image dissatisfaction. As such, we may conceptualize the body image as a dynamic cognitive process of self-appraisal that incorporates an individual's current summative percept of his or her own physical form.

Remarkable in its complexity, body image and body image dissatisfaction are believed to motivate and influence human behavior in innumerable, and often, striking ways. The desire to alter one's physical appearance is widely acknowledged and commonplace in society today: cosmetics, hairstyles, wardrobe, and exercise are all examples of everyday attempts to effect change of one's own body image. The majority of research examining the construct of bodily self-image examines its relationship to body weight and size, yet there are innumerable facets of our physical appearance that comprise our internal representation. Dermatologists are fundamentally tasked with correcting undesired and highly visible physical features by methods ranging from medical treatment of clinical skin diseases to cosmetic enhancement and reconstruction, often in an effort to restore or advance an individual's body image closer to his or her ideal. The extent to which individuals pursue such methods varies widely and exemplifies the variability in one's perception and prioritization of visible bodily features. Physicians who evaluate and treat patients who desire cosmetic enhancement or reconstruction will reasonably encounter a diverse range of body image concerns and dissatisfaction; consequently, they must remain vigilant for individuals who exhibit extreme degrees of body image distortion and dissatisfaction.

External Influences on Body Image

Fundamental to the development of body image are innumerable external sources of information that continuously enter an individual's conscious and subconscious awareness. Visual representations of body forms and features; peer and expert opinions on the worthiness of certain physical attributes and appearance; and established societal and cultural norms exemplify these pervasive sources of internalized ideals. The impact of this myriad of external influences is profound and forges an inerasable foundation in the ongoing construction of our bodily self-image.

Media and Advertising It is impossible to discuss body image in the present day without acknowledging the impact of various forms of media on body image. Extensive research links consumption of the media body ideals—that is, ultra-attractive and ultrathin or muscular images—with body dissatisfaction, negative self-esteem, and disordered eating beginning as early as preadolescence [4]. Even brief periods of viewing photographs of thin and round body images demonstrated an impact on viewers' judgments of body shapes. Specifically, viewing images of thin bodies subsequently decreased viewers' quality ratings of rounder bodies, whereas viewing images of fuller figures relatively increased ratings of round body shapes [5]. In men, for whom the media promotes a muscular body ideal, continuous exposure to images of ideal muscular bodies in advertisements is linked to increased body dis-

satisfaction [6]. In a more practical sense, women of average attractiveness are rated less beautiful when viewed after an attractive female in print media, and women underrate their own attractiveness immediately after viewing images of highly attractive women [7, 8]. Viewing frequency of reality television programs depicting cosmetic surgery not only correlates with body dissatisfaction but also increases willingness and perceived pressure to undergo cosmetic procedures [9]. Notwithstanding these potentially negative psychological effects to consumers induced by the depiction of unattainable body ideals, it is nevertheless naive to expect that a cultural vehicle as pervasive as the mass media impact will change considerably in the near future [10].

From another perspective, one might request cosmetic enhancement with the specific aim to reproduce the physical features of a particular celebrity. Familiarity is posited to correlate with a more positive or favorable body image ideal. In one study, subjects rated the mirror image of his or her self as superior to the true image as one would appear in a photograph [11]. As most individuals viewed their reflection with far greater frequency than photographs of oneself at the time of the study, this suggests that visual familiarity may more closely equate physical features with a favorable body image. When extended to friends and lovers, the individual's true image is more often preferred over the mirror, lending authenticity to the concept of familiarity as desirable beyond that of one's self-image. It is plausible that physical features from frequently viewed celebrities may be internalized into the ideal body image in a similar manner.

In addition, research reveals that we find composite facial photographs that merge the features of several different people more attractive than individual photographs [12]. This suggests that the cognitive "averaging" of facial features contributes more heavily to the framework of an ideal face than any one face alone. When considering that the frequencies of ideal facial features and body types are inarguably higher among celebrities and models across many forms of media than the general population, we begin to appreciate the extent to which mass media contributes to the individual's body image and internalization of ideals.

Family and Peers Parents may contribute to the development of body image in various ways. Direct parental comments about their child's body size or appearance in clothing, for example, may heighten a child's awareness of physical features from an early age. Males may be less affected by parental comments than their female counterparts [13]. Children may also learn to be dissatisfied about their bodies and looks by modeling parental concerns perceived through comments or weight-loss behaviors [14].

Peer influence on body image begins in childhood when young girls appear to be impacted at an earlier age and develop more dissatisfaction as a result of peer comments compared to boys [14]. This extends to adolescence and young adulthood, when females routinely outnumber males in body dissatisfaction. Further, peer evaluations of a third party's physical attractiveness can subsequently influence an individual's own judgment of beauty and may thus become internalized into one's own self-image ideal [7]. While verbal communication is clearly influential,

it is worth noting that congenitally blind individuals report significantly less body dissatisfaction than individuals blinded later in life, and all visually impaired individuals are more satisfied than their full-sighted peers [15].

Conventional Variances in Body Image

Gender To remark that men and women internalize markedly different body ideals would be an understatement. Relative to women, men internalize a larger and more muscular ideal and are generally more satisfied with body size and weight, although men are more likely to feel dissatisfied by being too thin than women [16]. Along the similar vein, women associate a lower facial adiposity with higher attractiveness than do their male counterparts, and the degree of facial adiposity deemed ideal for attractiveness by women is lower than that considered ideal for health [17]. Women are also more likely than men to be dissatisfied with skin tone and color, and this is illustrative of a recurring theme of greater overall body dissatisfaction in females [18]. Perhaps due to this relatively lower prevalence of body image dissatisfaction, men may bear more of a stigma when it comes to seeking out cosmetic procedures, and historically are considered a more psychologically disturbed subset of patients. However, more contemporary views highlight that the majority of men pursuing cosmetic plastic surgery endorse no more global self-image dissatisfaction or attention to appearance than their peers, and rate significantly lower than that of females of the same age [19].

Age The awareness of one's body begins early in childhood, and body dissatisfaction (particularly pertaining to weight) is well documented in girls and boys with prevalence increasing through the elementary years [14]. There exists an important link between the physical changes of puberty, body dissatisfaction, and clinical depression; and adolescent females with a negative body image are particularly at risk for future struggles with depression [20].

Body dissatisfaction intuitively increases with the transformative forces of time [21]. Physical signs of aging can have a significant impact on one's body image and, for many people, may provoke more general feelings of insecurity about advancing age. Longstanding deformities or chronic dermatologic conditions (e.g., vitiligo, psoriasis) may eventually become incorporated into the body image with subsequent acceptance as being part of the self. However, self-image concerns related to aging skin may contribute to social isolation, anxiety, and extreme or ill-advised pursuits of a youthful appearance [22, 23]. In contrast, body image concerns related to weight might, at least temporarily, diminish in women as they progress further into adulthood. Men, however, demonstrate nearly the opposite; the majority report higher dissatisfaction and dieting frequency later in adulthood [24].

Cultural and Ethnic Groups A great deal of research has examined the physical features most closely aligned with beauty, resulting in "ideal" ratios, shapes, and even

favorable personality characteristics [25]. However, much of this early research included predominantly Caucasian subjects, and such facial features or proportions deemed attractive in Caucasians may not naturally exist or correlate with average features in non-white individuals. Culture and ethnicity are formative to the body image, and so one's ideal image and future cosmetic enhancement will naturally fit within these parameters [26].

Body dissatisfaction is also variable among different ethnic groups. During formative childhood and teenage years, black females generally report less weight-related body dissatisfaction than their white counterparts. This is attributed, in part, to the overall tendency for black females to weigh more than white females and communal acceptance of larger body proportions [20]. Hair concerns are a significant source of body dissatisfaction in nearly half of African-American females. Hair loss and breakage are the predominant clinical concerns, and these have far-reaching impacts on self-esteem, physical activity, and even doctor–patient rapport [27]. Skin color is also an important feature of one's self-image and degree of attractiveness. Darker-skinned individuals tend to find darker skin more attractive and likewise among fair-skinned counterparts, but both groups favor an intermediate brown tone over darker brown [18, 28]. We can presume then that skin color may have more of an impact on self-image for individuals at both ends of the skin color spectrum, and dissatisfaction may motivate behaviors intended to bring skin tone closer to the ideal.

Though not a distinct cultural group in the traditional sense, tattooed individuals are of great interest when considering the body image and behaviors effecting change on one's appearance. Tattoo art in the present day is no longer strictly aligned with the male gender, criminal behavior, or social outliers and is seen by many as a form of artistic self-expression. Early research on body image in tattooed individuals revealed them to have stronger positive feelings about their bodies than nontattooed peers [29], and contemporary research reports improvement in body image after obtaining one's first tattoo [30].

Defining "Normal" vs. "Abnormal" Body Dissatisfaction

Essentially, every person experiences a time when one's beliefs about his or her current physical state do not perfectly match with the internally constructed body ideal. The conscious acknowledgement of this discrepancy may, thereby, induce a highly variable degree of emotional distress broadly termed "body dissatisfaction." The degree of dissonance does not simply correlate with the degree of stress in a similar manner for every person. Likewise, the motivations to undergo procedures that effect change in one's appearance are unique to each individual and often unpredictable, though modern views of beauty and aesthetic medicine posit that routine, appropriately selected cosmetic interventions "may be no more psychologically deviant than the resolution to brush one's teeth [31]."

By report, body dissatisfaction is common and perhaps normal among adults in developed countries. In general, more women than men report body dissatisfaction, particularly as it pertains to body weight and the feeling that one is too heavy. The point prevalence of body dissatisfaction was reported in one study to be around 11 % in men to 21 % in women across all ages; this increased by an additional 5–10 %, respectively, when including the avoidance of wearing one's bathing suit in public [16]. However, baseline estimates of body dissatisfaction range widely—from 11 to 72 % for women, and 8–61 % for men—given the tendency for ideals and dissatisfaction to vary across lifespan, gender, and cultural backgrounds [32]. Weight-specific body dissatisfaction exists in the majority of young adults in the USA [24]; and in one study, 75 % of women reported an ideal body image as smaller than one's own [33]. More broadly, both men and women tend to rate themselves significantly less attractive than their own romantic partners do [34], implying that internal representations of bodily ideals and interpretation of disparities differ for oneself compared to others, but a measurable deviation from the ideal exists at baseline.

Body size and weight are a common source of body dissatisfaction, especially among women. Regardless of actual weight, an individual who believes that her body is larger than her internal ideal is more likely to experience such dissatisfaction and be more concerned with how others view her body size. This internal dissatisfaction and concern with public perception may serve to motivate chronic dieting behaviors [33], and the cognitive act of self-comparison to others' physical features and physiques is believed to play a prominent role in the development of body dissatisfaction [35]. While not a universal phenomenon, mere exposure to images of thin, below-normal weight bodies has been shown to correlate with body dissatisfaction in young adult females [36]. However, sources of highest body image dissatisfaction among women presenting for plastic surgery include the breasts and facial structures with far greater frequency than areas prone to fat deposition, such as the thighs and buttocks [37], indicating that a substantial portion of procedure-seeking patients have self-image concerns that lie well beyond the scale.

So how does this phenomenon of body dissatisfaction develop? While seemingly complex beyond measure, body image dissatisfaction in young adult females can be predicted by certain cognitive acts. Internalizing a thin body ideal and making frequent social comparison of one's self and body against others both correlate with greater body dissatisfaction; such comparisons may strengthen the incorporation of an ideal, thereby compounding dissatisfaction. Close friends of the same gender are an important social source of body comparison and are often perceived as being closer to the self-ideal [38]. Interestingly, females reporting a stronger, more stable sense of self do not experience the same dissatisfaction, suggesting that young women may seek to solidify their sense of identity by making social comparisons [35]. Body image dissatisfaction may then initially develop as an unfortunate consequence of the normal process of self-discovery when specific body features become integrated into one's identity. We can theorize that such initial comparisons of weight and body shape in one's younger years may naturally expand to incorporate broader features of beauty and eventually turn to social comparisons of aging.

Dissatisfaction with the bodily self-image is a requisite motivator of appearance manipulation and self-beautification, though the emotional impact of such dissatisfaction is less predictable. Despite frequently experiencing concurrent psychological stressors, studies reveal that women presenting for plastic surgery report a normative degree of body dissatisfaction and investment in physical appearance [39]. It is also worth noting that individuals with facial deformities demonstrate a wide variance in body dissatisfaction and emotional distress that does not correlate with objective severity, and the individuals who do seek corrective medical procedures tend to be of mild to moderate severity [40]. This implies then that body image concern, while essential, need not be of extreme severity to motivate cosmetic intervention. A number of other factors (procedure availability, financial resources, societal practices, major life events) may in combination provide the impetus to undergo cosmetic surgery.

Clinical Impact of Body Dissatisfaction

Body image achieves clinical relevance in many medical settings, and health care providers in appearance-related medical specialties, particularly dermatology and plastic surgery, are often called upon to improve a patient's outward appearance through medical therapies and cosmetic procedures. Interestingly, baseline surveys of male and female cosmetic surgery patients reveal that they do not demonstrate greater dissatisfaction with their overall appearance compared to non-surgery seeking peers. Patients do, however, report significantly greater dissatisfaction with the particular physical feature they seek to correct (e.g., nose, breasts) relative to a normative sample, and such concern is generally corroborated on examination by the consulting surgeon [19, 39]. A certain degree of body dissatisfaction attributable to dermatologic disease is to be expected in patients presenting with common conditions, such as acne, psoriasis, and alopecia, as well as less common conditions like cutaneous lupus erythematosus and scleroderma [41–45]. Such dissatisfaction may be more pronounced in adolescence and young adulthood, and it stands to potentially impact social development and peer relations [46].

A validated measure of the cutaneous body image (CBI) revealed that higher dissatisfaction exists among patients presenting with common dermatologic complaints when compared to the general population, but the baseline "average" score for a population varies between different cultural groups [47, 48]. The Cutaneous Body Image Scale (CBIS), while mainly employed as a research tool, may prove a useful bedside metric to assess baseline dissatisfaction and confirm improvement with treatment. Inquiring about a patient's body image and feelings of dissatisfaction may open a therapeutic dialog that validates the individual's concerns and provides the practitioner with valuable information about the extent of the psychological impact from body dissatisfaction and the patient's treatment expectations [46].

As cosmetic procedures continue to increase in popularity, recent research on the impact of all interventions on quality of life, self-esteem, and body image has

demonstrated generally positive outcomes across a range of surgical and cosmetic procedures on the face [49]. In well-selected adults, significant postoperative impacts on body image and overall satisfaction are noted within 3 months of surgery, with sustained improvements demonstrated after 2 years [37]. Similarly, chemodenervation with botulinum toxin type A for facial wrinkles has been reported to demonstrably improve patient body image using quality of life and appearance-related self-esteem scales as surrogate markers [50]. Prospective assessment of hyaluronic acid soft-tissue fillers for facial rejuvenation in clinically aged skin revealed both immediate and sustained improvements in patient appearance-related self-esteem [51]. It is therefore reasonable to assume that the "average" patient undergoing a cosmetic procedure will be satisfied with the result and subsequently experience more positive feelings surrounding his or her body image. Some even argue that the medical community largely underestimates the psychological benefits of cosmetic interventions, particularly in the aging population [22], and it may be unethical to minimize the potential impact on quality of life that a corrective procedure may bring to individuals with visible deformities [10].

While a certain degree of body image dissatisfaction is normal and expected in patients presenting for treatment of dermatologic conditions or cosmetic procedures, extreme dissatisfaction or psychological impact frequently heralds an underlying psychiatric disorder. Body dysmorphic disorder (BDD), as discussed in later chapters, is manifested by the extreme distortion of perceived flaws in body parts or appearance with a psychological impact that is out of proportion to any objective disfigurement. These patients have a problem with how they *view* their physical appearance and not how they actually look. Patients generally lack insight into how disproportional these concerns seem to an objective practitioner. The treatment of cosmetic complaints in a patient with BDD is discouraged, and referral to a mental health specialist is imperative [52]. Unfortunately, the boundaries between normal and abnormal can be hard to ascertain, with the differences between BDD and normal appearance concerns sometimes just being a matter of degree, similar to other diseases and diagnostic nomenclature, such as borderline hypertension and prediabetes. A multitude of additional psychiatric conditions—including major depression, eating disorders, posttraumatic stress disorder, psychotic disorders, and others—may present concurrently with dermatologic complaints. Comorbid psychiatric conditions are not uncommon and have the potential to warp one's body image, compound feelings of dissatisfaction, and complicate treatment decisions. For these reasons, all patients who report or demonstrate features of a psychiatric illness are best referred to a mental health provider and treated appropriately in tandem. Practitioners must remember that mental illness is pervasive in society and develops along a continuum, and thus, practice vigilance when evaluating and treating patients with body dissatisfaction.

Conclusion

"Nothing has so marked influence on the direction of a man's mind as his appearance, and not his appearance itself so much as his conviction that it is attractive or unattractive [53]." Indeed it is one's body image, particularly the perceived deviation from one's internal ideal and the subjective import this carries, that is ultimately what drives many individuals to seek cosmetic enhancement. However, the relative extent of deviation from one's internal ideal predicts neither the degree of cognitive and emotional dissonance an individual experiences nor the motivation that one may feel to physically alter one's appearance. It is important to acknowledge that body image dissatisfaction is not synonymous with body dysmorphic disorder, but rather is its own distinct entity. In the former, treatment of externally visible medical conditions or addressing cosmetic concerns can significantly allay baseline feelings of body dissatisfaction for the majority of individuals. Occasionally, the extent of a patient's perceived deformity, and corresponding desire for cosmetic correction, fall widely outside of the expected range. These individuals are often afflicted by an underlying psychiatric disorder and may suffer from BDD. Such patients may in fact be considered to have too much body image dissatisfaction to be suitable for treatment as this emotional disquiet is unlikely to resolve with cosmetic procedures.

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Chapter 6
Body Dysmorphic Disorder: Historical Aspects

Sarah H. Hsu and Neelam A. Vashi

Obsession with Perfection

"I hate my juicy lips. People, they stare at me, especially on the train, making fun of my hideous, juicy lips." Steven's story led him to spend hundreds of dollars a month on beauty products to improve the look of his supposed juicy lips and miss work due to the inability to bear the "disgusted stares" on the train. We met him in the dermatology clinic while he was asking for a "potion" that would cure his "diseased lips." Meeting Steven makes us to rethink the initial possibility that these feelings could merely apply to anyone and are representative of society's quest for beauty, supported by the multibillionaire dollar cosmetic industry. All people, in fact, do spend time and resources on beauty enhancing measures, and at times, have been unhappy with some aspect of their appearance. The scientific literature gives us evidence of our innate ability to easily extrapolate information from a person's face to make an evaluative assessment. However, it also shows that many different aspects of culture, history, and personality can reshape our biologic perceptions, revealing to us a dynamic process of aesthetic appreciation that can range from normal appearance concerns to abnormal disorders of self-perception. Body dysmorphic disorder (BDD) is a disorder of self-perception; it is the impairing preoccupation with a nonexistent or minimal flaw in appearance. It is the obsession with perfection. These patients complain of misshapen, disfigured, and grotesque body parts, supposed

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deformities that make them feel intolerably ugly. BDD is a relatively common yet under-recognized disorder. People with BDD compare themselves to others, hide body parts, and have impaired functioning in society. When severe, this disorder can destroy a person's life. Although it has been described for centuries, it has only more recently come to the attention of the medical community.

History of Body Dysmorphic Disorder

BDD is not just a reflection of modern society's preoccupation with appearance. A description of this disorder was initially documented in 1891 by the Italian psychiatrist Enrico Morselli. He named it dysmorphophobia, derived from the Greek word dysmorphia, meaning ugliness, specifically of the face [1]. Jerome [2] translated Morselli's classic article describing dysmorphophobia, in which he wrote:

> As the result of some observations I have made in recent years, I propose to add two new and previously undescribed varieties to the various forms of insanity with fixed ideas, whose underlying phenomenology is essentially phobic. The two new terms I would like to put forth, following the nomenclature currently accepted by leading clinicians, are dysmorphophobia and taphephobia.
>
> The first condition consists of the sudden appearance and fixation in the consciousness of the idea of one's own deformity; the individual fears that he has become deformed (dysmorphos) or might become deformed, and experiences at this thought a feeling of an inexpressible disaster… The ideas of being ugly are not, in themselves, morbid; in fact, they occur to many people in perfect mental health, awakening however only the emotions normally felt when this possibility is contemplated.
>
> But, when one of these ideas occupies someone's attention repeatedly on the same day, and aggressively and persistently returns to monopolise his attention, refusing to remit by any conscious effort; and when in particular the emotion accompanying it becomes one of fear, distress, anxiety, and anguish, compelling the individual to modify his behaviour and to act in a pre-determined and fixed way, then the psychological phenomena has gone beyond the bounds of normal, and may validly be considered to have entered the realm of psychopathology.
>
> The dysmorphophobic, indeed, is a veritably unhappy individual, who in the midst of his daily affairs, in conversations, while reading, at table, in fact anywhere and at any hour of the day, is suddenly overcome by the fear of some deformity that might have developed in his body without his noticing it. He fears having or developing a compressed, flattened forehead, a ridiculous nose, crooked legs, etc., so that he constantly peers in the mirror, feels his forehead, measures the length of his nose, examines the tiniest defects in his skin, or measures the proportions of his trunk and the straightness of his limbs, and only after a certain period of time, having convinced himself that this has not happened, is able to free himself from the state of pain and anguish the attack put him in.
>
> But should no mirror be at hand, or should he be prevented from quieting his doubts in some way or other with rituals or movements of the most outlandish kinds, the way a rhypophobic who cannot get water to wash himself might, the attack does not end very quickly, but may reach a very painful intensity, even to the point of weeping and desperation.

In this excerpt, Morselli's description of dysmorphophobia is not simply characterized by one's fear of having a physical defect, as the suffix "phobia" might suggest. Rather, it describes an individual who displays polarization of attention, charged

with an emotion that focuses on a particular aspect of the body [3]. It is the development of obsessive thoughts about one's appearance and engagement in compulsive behaviors, such as excessive mirror checking, to the extent that it interferes with daily functioning.

Years later, in 1903, the next major historical reference to dysmorphophobia was made by the French psychiatrist Pierre Janet [4]. He described a married woman who was housebound for five years due to the preoccupation with the belief that she had a moustache. She avoided engaging with her neighbors out of fear that she would be ridiculed for her "hairy face" and imagined them shouting at her, "Hairy, hairy!" This obviously caused her severe distress and significantly impaired her social functioning. In this same account, Janet also described the first possible use of behavioral therapy in treating these patients. He noted "[she underwent] treatment dictated by her husband under our instruction" that "consisted of motivational and attention exercises to combat her shyness" [5].

Like Morselli, Janet classified dysmorphophobia to belong to a large class of syndromes similar to obsessive-compulsive disorder, and he called it l'obsession de la hontu du corps or obsession with shame of the body. He regarded this disorder to be "common, invariably overlooked" and one that "evoked extreme shame," as individuals feared being viewed as ugly and ridiculed. His sentiments remain valid today in that BDD is prevalent but continues to be an under-recognized condition [6].

Another notable historical figure who is credited with describing dysmorphophobia is Emil Kraepelin. Kraepelin, a German psychiatrist and regarded by many as the founder of modern psychiatry, believed that biological and genetic disorders were the primary causes of mental illnesses. He recognized dysmorphophobia as a psychiatric disorder and included it in the eighth edition of his textbook, published in four volumes between 1909 and 1915. Kraepelin [7] stated, "some patients cannot rid themselves of the thought of having something conspicuous or ridiculous on their bodies, arousing the attention or ridicule of passers-by with the strangely shaped nose, crooked legs or a repellent odor." Though Kraepelin used Morselli's term dysmorphophobia in naming this disorder, he did not mention Morselli himself. Therefore, some references [8] actually acknowledge Kraepelin for recognizing this disorder. Regardless, similar to Morselli and Janet, Kraepelin classified dysmorphophobia to be an obsessive neurosis [9], describing it as one of the obsessive-compulsive neuroses in his textbook.

Perhaps one of the best-known cases in the history of BDD and psychoanalysis is a patient of Sigmund Freud, who went by the pseudonym "Wolf Man." He was later known to be Sergei Pankejeff, a wealthy Russian aristocrat who acquired his name "Wolf Man" from a dream he had as a child. In his later life, Pankejeff began showing symptoms of BDD [10]. He became fixated with his nose, which led him to repeatedly seek out the opinions and treatments of physicians for "blackheads, swellings, wounds from picking pimples, and imaginary scars" [11]. At one point, he complained that his nose had been injured due to a dermatologist's ill-advised use of electrolysis, leaving him with a scar or a hole in his nose. According to Ruth Mack Brunswick, his psychoanalyst at the time, "nothing whatsoever was visible on the small, snub, typically Russian nose of the patient." Pankejeff realized that

though the injury was all too noticeable to him, his reaction to it was abnormal. Therefore, having exhausted all his dermatological resources, he reconsidered help through psychoanalyses. By the time that Pankejeff came to Brunswick for evaluation, he was significantly distraught. Gardiner [12] published Brunswick's report in *The Wolf Man,* and in it she explained:

> Having been told that nothing could be done for his nose because nothing was wrong with it, he felt unable to go on living in what he considered his irreparably mutilated state…He neglected his daily life and work because he was so engrossed, to the exclusion of all else, in the state of his nose. On the street he looked at himself in every shop-window; he carried a pocket mirror which he took out to look at every few minutes. First he would powder his nose; a moment later he would inspect it and remove the powder. He would then examine the pores to see if they were enlarging to catch the hole, as it were, in its moment of growth and development. Then he would again powder his nose, put away the mirror and a moment later bring the process anew…
>
> The maid who opened the door in my apartment was afraid of him because as she said, he always rushed past her like a lunatic to the long mirror in the poorly lighted reception hall. He would not sit down and wait, like the other patients, to be admitted to my office; he walked incessantly up and down the small hall, taking out his mirror and examining his nose in this light and that. It was in this condition that he began his analysis with me.

Again, a patient is described as being painfully obsessed with a particular body part, as he engages in compulsive behaviors of repetitive mirror checking and examination to the exclusion of his daily life. In order to overcome this obsession, Pankejeff described making his own behavioral program. In his autobiography, he wrote [13], "I gathered all my strength, stopped looking in the mirror, and somehow overcame these ideas in a few days…I took a stand against psychoanalysis and made a decision of my own. Stop thinking about your nose! It was much greater success than with Freud because I rejected transference." Although the treatment of BDD is not always as simple and successful as Pankejeff's account, it demonstrates the importance of the patient's participation and commitment in developing a successful therapeutic program.

Historical Ideas on the Etiology of Body Dysmorphic Disorder

Regarding the etiology of BDD, there are various theories throughout history, which can be broadly divided into three categories: psychological, sociocultural, and biological. The currently accepted biological theory along with the etiology and pathophysiology of BDD are discussed in a separate chapter, but the historical aspects in regards to the psychological and sociocultural categories are briefly discussed here.

From a psychological perspective, it has been suggested that dysmorphophobia arises from an unconscious displacement of sexual or emotional conflicts, such as feelings of inferiority, guilt, and poor self-image [14–19]. It has also been suggested that the body part of focus may be a displacement of another body part, such as the nose representing the phallus [16, 18, 20–24] and, as such, may symbolize

impotence [25]. Further, some have proposed that the body part may be a way of identifying with another person [24], often a parent [15, 21].

From a sociocultural perspective, dysfunctional family backgrounds [23] and unfavorable childhood experiences have been thought to be a contributing factor, as these individuals often develop persistent feelings of being unloved, insecurity, and rejection [16, 25] and may subsequently project these emotions onto a body part.

Philippopoulos [1] presented a case in which after evaluation of an adopted teenage girl with dysmorphophobia, he concluded that it was a defense mechanism to suppress the patient's unconscious urge to yield to sexual temptation. He believed that ugliness was a defense, which allowed women to reject their sexuality [26]. In line with this theory, some have proposed that incestuous wishes and castration anxiety were unconscious motives in the development of dysmorphophobia [22, 23].

These theories come into play in the interpretation of Pankejeff's engrossment with his nose. He was from a dysfunctional family with a lack of parental love. He was in an estranged relationship with his father, who reportedly favored his gifted and precocious sister [10]. Both his father and sister suffered from depression and ultimately committed suicide within a year of each other, in 1906 and 1907. It was around this time when Pankejeff also began showing signs of depression. Freud believed that much of Pankejeff's conflicts stemmed from an unresolved love for his father and identification with his mother [27]. From this, some have interpreted that Pankejeff's nose represented his penis and symbolized his wish to be castrated and transformed into a woman, like his mother. Furthermore, Pankejeff's obsession apparently occurred soon after seeing a wart on his mother's nose [21], supporting this historical theory that dysmorphophobia may stem from one's identification of a body part with another individual.

Nomenclature

While dysmorphophobia has been the common name used to describe what is now known as BDD, there have been other words and phrases used throughout medical history to describe this disorder. As discussed above, Janet named it l'obsession de la hontu du corps or obsession with shame of the body. Jahrreiss, in 1930, and later Ladee captured some of the key aspects of BDD through the German words Schonheitshypochondrie, meaning "beauty hypochondria," and Hasslichkeitskummerer, translated as "one who is worried about being ugly" [16]. Ladee [23] is quoted to say, "the preoccupation is so exclusively centered on one aspect of the bodily appearance, which is experienced as deformed, repulsive, unacceptable or ridiculous, that the whole of one's existence is dominated by the preoccupation and nothing else has any significance anymore." Other terms used to describe BDD include dermatologic hypochondriasis, which refers to a dysmorphophobia-like syndrome that focuses on the skin and hair [28].

In older European literature, dysmorphophobia was also classified as a monosymptomatic hypochondriacal psychosis [29, 30], which describes a psychotic dis-

order of a single delusional belief of somatic nature, usually in the absence of other prominent psychotic symptoms [31]. Somatic type delusions included in this classification were delusions of parasitosis (the belief that one is infested with parasites) and delusions of bromosis (the belief that one emits an offensive body odor) [29]. Other names used to refer to symptoms consistent with dysmorphophobia have included hypochondria, dermatophobia, and dermatologic non-disease [32].

Diagnosis within the Diagnostic and Statistical Manual of Mental Disorders

With the presence of several different diagnostic systems and the need for a unified classification of psychiatric disorders, the American Psychiatric Association developed the Diagnostic and Statistical Manual of Mental Disorders (DSM) and published the first edition in 1952.

The first and second editions of DSM were primarily focused on the psychodynamic perspective. However, there was a major shift with the publication of DSM-III in 1980, where the previously mentioned Emil Kraepelin's concepts on the importance of biology and genetics played an important role in its development [33].

In this edition of the DSM, dysmorphophobia also first appeared as a psychiatric classification in the USA, being listed as an example of an atypical somatoform disorder [34]. The "atypical" designation here was similar to the "not otherwise specified" category in the later editions of DSM. There were no specific diagnostic criteria at this point, and dysmorphophobia was loosely described to apply to "individuals who are preoccupied with some imagined defect in physical appearance that is out of proportion to any actual physical abnormality that may exist" [34, 35].

A revised DSM-III, or DSM-III-R, was published in 1987, in which several key changes were made in the diagnosis [34]. First, dysmorphophobia was officially renamed body dysmorphic disorder, in order to distinguish it from primary phobic conditions. Second, it was classified as a distinct disorder in the somatoform disorders section. Furthermore, it differentiated nondelusional BDD from delusional disorder, somatic type [16]. As such, a diagnosis of BDD was designated to those individuals who were able to acknowledge the possibility that they may be exaggerating the extent of the defect or that there may be no defect at all. On the other hand, the delusional counterpart was classified as a psychotic disorder.

With the publication of DSM-IV, other minor changes were made to the criteria. Arguably, the most notable change was that the distinction between delusional and nondelusional BDD was diminished, due to growing evidence showing that the delusional and nondelusional types may be variants of the same disorder [34]. In DSM-IV-TR [36], the diagnostic criteria for BDD included preoccupation with an imagined defect in appearance that caused clinically significant distress or impairment in functioning. In addition, criterion included that the preoccupation could not be better accounted for by another mental disorder. In the most recent publication of DSM-V in 2013, BDD is now categorized under the obsessive-compulsive spec-

trum category, reflecting increased evidence that these disorders are related. The diagnosis of BDD remains largely unchanged from the previous edition. However, it does include an additional criterion of the performance of repetitive behaviors or mental acts and specifiers in regards to insight and a specific subtype of muscle dysmorphia [37].

Conclusion

In the modern era, several notable public figures have been thought to have BDD. Examples include pop artist Andy Warhol, author Franz Kafka, poet and novelist Sylvia Plath, and singer Shirley Manson [4]. Further, the disorder is becoming more widely publicized and was even featured in the Music Television (MTV) series *True Life*, in an episode titled "I Hate My Face."

BDD can be devastating, leading to social isolation and even suicide in instances. Recognition and appropriate treatment are necessary to help these patients. With increasing visibility, recognition, and understanding of BDD, there is hope that the stigma related to the disease will be further reduced. And, in the process, there will be fewer barriers for those who need and seek treatment.

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Chapter 7
Diagnosis of Body Dysmorphic Disorder

Mohammad Jafferany, Katlein França and Neelam A. Vashi

Introduction

Body dysmorphic disorder (BDD) is a chronic and, often, severe condition. The severity of BDD lies along a spectrum, ranging from mild to life-threatening symptoms. It is often difficult to diagnose and can go unrecognized for many years. Those afflicted are often reluctant to reveal their concerns to others as many are ashamed of their appearance and/or the excessive focus they place on how they look [1, 2].

In 1980, BDD was first introduced in the psychiatric literature in the Diagnostic and Statistical Manual of Mental Disorders (DSM) by the American Psychiatric Association—DSM-III [3], as an atypical somatoform disorder. In the revised DSM-III, it was separately diagnosed in the somatoform disorder section [4]. Further changes were made in DSM-IV [5], which required the exclusion of another mental health disorder such as anorexia nervosa. It was still classified as a somatoform disorder. Changes from DSM-IV TR criteria mainly focus on the association of body dysmorphic disorder with obsessive–compulsive spectrum disorder. In the new

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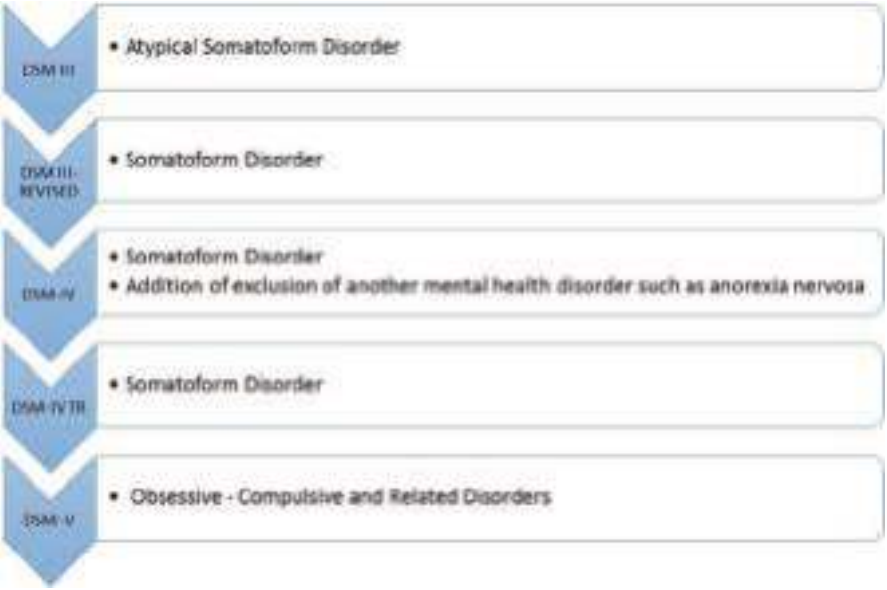

Fig. 7.1 BDD classification history according to the Diagnostic and Statistical Manual of Mental Disorders by the American Psychiatric Association

DSM-V, BDD is now categorized under the obsessive–compulsive spectrum category, reflecting increasing evidence that these disorders are related [6]. See Fig. 7.1.

DSM-V Criteria for Body Dysmorphic Disorder [6]

A. Preoccupation with one or more perceived defects or flaws in physical appearance that are not observable or appear slight to others.
B. At some point during the course of the disorder, the individual has performed repetitive behaviors (e.g., mirror checking, excessive grooming, skin picking, reassurance seeking) or mental acts (e.g., comparing his or her appearance with that of others) in response to the appearance concerns.
C. The preoccupation causes clinically significant distress or impairment in social, occupational, or other important areas of functioning.
D. The appearance preoccupation is not better explained by concerns with body fat or weight in an individual whose symptoms meet diagnostic criteria for an eating disorder.

In addition to the above diagnostic criteria, specifications are included to help diagnosing the disorder. First, it is to be specified if the person has muscle dysmorphia, which is a preoccupation that one's body build is too small or insufficiently muscular [6]. This disorder occurs almost exclusively in males with normal or even

muscular-appearing bodies [7]. The majority diet, exercise, lift weights, and some use anabolic steroids and take food supplements. Second, the degree of insight regarding the beliefs is to be specified. Insight ranges from good or fair (individual is able to recognize that BDD beliefs are definitely, probably, or may or may not be true), to poor (individual thinks that BDD beliefs are probably true), to absent insight with delusional beliefs (person is completely convinced that BDD beliefs are true) [6].

Diagnostic and Associated Features

As indicated by the diagnostic criteria, the first criterion of BDD involves the belief by an individual that she/he has one or more perceived flaw in physical appearance that appears unattractive, deformed, or in some other way abnormal. The flaws or deficits that brought attention to an afflicted individual are either not apparent or very slight to others. Although any body area can be of concern, the preoccupations most often focus on the skin, hair, or nose [7]. The concerns within these categories range widely and include acne, wrinkles, paleness, size and shape of nose, and both hair thinning or excessive hair growth. Disliked body parts are present simultaneously and sometimes sequentially, emerging in three typical patterns. Some are concerned with just one body part, some with one body part and then add new parts with time, and some have changing areas of concern [8]. These thoughts are difficult to control and can be quite time-consuming, occurring on an average 3–8 h per day [7].

The second criterion involves the performance of repetitive behaviors (e.g., mirror checking and skin picking) or mental acts (e.g., comparing oneself to another). These behaviors are also time-consuming and difficult to control. Although these behaviors may momentarily give the individual a brief relief, they are overall unwanted and not pleasurable. The most common of these features is mirror gazing, with about 80 % pathologically gazing at their reflection [9]. Mirrors dichotomously represent fear and hope [8]. These patients are driven by the desire to know exactly how they look and hope that they may look different. In a survey on mirror use, BDD patients were found to report a mean duration of an extended mirror session for 73 min while control participants for 21 min [9]. Skin-picking behavior is also very common in BDD patients; in a series of 123 patients, 27 % reported the behavior [10]. These types of compulsive behaviors can sometimes become very destructive, worsening a mild condition with ensuing infection and scars. Other time-consuming and repetitive tasks include excessive grooming and camouflaging, which can involve extensive hair styling, ritualized makeup application, touching of perceived defects, frequent change of clothing, and use of hats. These behaviors are aimed at improving the perceived deficits. For example, those with muscle dysmorphia may excessively exercise or lift weights. Some will excessively tan in hopes of improving pale skin or alternatively masking other perceived defects like wrinkles,

brown spots, or acne. In addition to repetitive behaviors, those with BDD may also seek reassurance from others. They desire reassurance that they look okay, try to convince others of the reality of the ugliness, and request advice on how to improve the deficit [8]. Given that some patients with BDD will also excessively diet and exercise, BDD must be differentiated from eating disorders, such as anorexia nervosa and bulimia nervosa (Criterion D). In general, those with BDD will more likely be of normal weight and also have other body concerns.

These preoccupations along with repetitive acts are time-consuming and intrusive to these patients, which lead us to Criterion C. For a diagnosis of BDD, the preoccupations must cause clinically significant distress or impairment in social, occupational, or other important areas of functioning [6]. Impairment can range, but, on average, psychosocial functioning and quality of life are quite poor [7, 11]. Impairment can include missing school or work, avoidance of relationships and intimacy, and even becoming housebound or psychiatrically hospitalized [11, 12]. Increased severity of symptoms is associated with both poorer functioning in all realms of life and poorer quality of life [7].

Insight into beliefs can range from good to absent. Those with absent insight are delusional and are completely convinced that their appearance view is accurate. Delusions can also take the form of believing that others are taking special notice and mocking them because of the defects [11]. In those with BDD, insight is usually poor, with at least one third or more having delusional beliefs [13]. Those with delusional beliefs tend to be more resistant to therapy and often have greater morbidity.

Body dysmorphic by proxy refers to a form of BDD in which persons are preoccupied with defects that they perceive in another person's appearance [6]. For example, a wife may think her husband is balding. In some cases, the person of concern will also start to worry about his/her own appearance [8]. In one case, a pregnancy termination was requested by a patient who believed that her child would be born with dysmorphic features [14].

Differential Diagnosis

Body dysmorphic disorder can be confused with other diagnoses including eating disorders, obsessive-compulsive related disorders, major depressive disorder, anxiety disorders, and psychotic disorders. Importantly, normal appearance is in the differential diagnosis.

Those with normal appearance concerns and/or clearly noticeable physical defects do not have BDD [6]. These people do not display the typical repetitive behaviors and have unimpaired functioning in society. Of note, skin picking can cause obvious physical defects [12]. BDD should be diagnosed if BDD-related skin picking is causing the perceptible appearance changes.

Eating disorders, such as anorexia nervosa and bulimia nervosa, cause individuals to have concerns about being overweight. Weight concerns may occur in BDD as well; however, BDD dissatisfaction often involves a broader extent of body areas,

while those with eating disorders focus on weight and shape [13, 15, 16]. Eating disorders overall have a much higher female to male ratio than BDD. In addition, those with anorexia nervosa may feel more satisfied with weight loss, while people with BDD nearly always feel distressed [8]. Those with BDD will more likely be of normal weight and also have other body and appearance concerns. Those with BDD appear to have more negative self-evaluation and poorer functioning and quality of life [16, 17].

Anxiety, especially social anxiety, is also common in BDD patients. Social anxiety disorder is characterized by an excessive fear of social situations and embarrassment, avoidance, and introversion, many of these features which are shared with BDD [18–20]. In those with BDD, the anxiety is clearly due to appearance concerns and the belief that they will be ridiculed or rejected because of this. Social anxiety disorder tends to occur at a relatively earlier age of onset. Kelly et al. [21] reported that BDD patients are more likely to have obsessive–compulsive disorders, eating disorders, and psychotic disorders compared to patients with social anxiety disorder.

Patients with obsessive–compulsive-related disorders have symptoms that are not primarily focused on appearance and typically have more insight into their disorder than those with BDD [13], with 2 % having delusional beliefs compared with 27–60 % respectively [22–25]. Trichotillomania is a hair-pulling condition that is also an obsessive–compulsive-related disorder; however, if the hair removal is intended to improve appearance, than BDD is diagnosed. Depressive symptoms are quite common in those with BDD; however, BDD should be diagnosed if the criteria are met as outlined above [6]. Those with BDD often have delusional beliefs in that they are completely convinced that their ideas are correct. However, they typically do not display other symptoms of psychotic disorders such as auditory and visual hallucinations, disorganized thought, and other perceptual abnormalities. In addition, the delusions in individuals with BDD center on their body image. According to DSM-V, BDD should not be diagnosed if the preoccupation focuses on the belief that one emits a foul or offensive body odor. This is considered to be olfactory reference syndrome, which, to date, is not a DSM-V disorder [6].

Body Dysmorphic Disorder and Comorbidities

Associated comorbidity in BDD may include depression, anxiety, social phobia and avoidance, obsessive–compulsive disorder (OCD), skin picking, perfectionism, neuroticism, and substance abuse [26, 27]. Different models have proposed explanations for comorbidity among disorders, such as chance association (random co-occurrence), symptom nonspecificity, and shared etiology or pathophysiology. The latter may explain the high comorbidity of obsessive–compulsive disorder, anxiety, depression, social anxiety disorder, and eating disorders with BDD patients (Fig. 7.2).

Fig. 7.2 Body dysmorphic disorder and common comorbidities

The most common comorbid disorder is major depressive disorder, with lifetime comorbidity at 75–76 % [13, 15, 28]. A high proportion of BDD sufferers have comorbid lifetime OCD, approximately 32–33 % [13, 15, 28]. Patients with BDD and OCD have shared genetic, environmental, and phenotypic variables [29]. Both disorders are characterized by recurrent, time-consuming thoughts and ritualized behaviors [13]. Shared similarities include high levels of perfectionism and preferences for symmetry, repetitive checking behaviors, and avoidance of triggering situations [30]. Both have similar male to female ratios and average age of onset. Data also suggest close association between the two disorders on the basis of their response to pharmacologic treatments and is also supported by comorbidity and family studies [31].

Social anxiety disorder, or social phobia, is another common condition comorbid with BDD and should be carefully evaluated on the basis that both conditions are characterized by concerns for being negatively evaluated by others [18]. Comorbid lifetime social phobia is quite common, with lifetime rates at 37–39 % [15, 28]. Both conditions have similar gender distribution and history of suicide attempts.

A diagnostic and conceptual overlap has been reported between BDD and eating disorders, sharing distorted body image preoccupation concerns [16, 17]. Significant overlap between these two disorders has been emphasized in different studies. Data indicate that 12 % of inpatients with eating disorders have comorbid BDD and demonstrate high prevalence of dissatisfaction with non-weight-related body image [32]. Dyl et al. [33] reported that patients with significant weight/shape concerns also endorsed significantly more symptoms of depression, anxiety, and suicidality, as well as higher levels of dissociation, sexual concerns, and posttraumatic stress disorder symptomatology.

The lifetime prevalence of a comorbid substance use disorder is approximately 30–50 % [15, 28, 34]. The most commonly abused drugs are alcohol and cannabis. In one study, 68 % reported that BDD contributed to their substance use disorder.

Most patients with BDD are convinced and have delusional beliefs that they have physical deficits and people are watching and judging them. Very few patients have good insight about their disease. Recently in DSM-V, a specifier has been added that patients with BDD may present with a range of insight, from good, poor, to absent [6].

Scales Used for Body Dysmorphic Disorder

Multiple scales have been developed to help health professionals identify and measure BDD. Scales pertinent to dermatology, plastic surgery, and others who practice aesthetic medicine will be further discussed in greater detail later in this book. These include the Body Dysmorphic Disorder Questionnaire (BDDQ), Body Dysmorphic Disorder Questionnaire-Dermatology Version (BDDQ-DV), Body Dysmorphic Disorder Examination-Self Report (BDDE-SR), Body Dysmorphic Symptom Scale (BDSS), Dysmorphic Concern Questionnaire (DCQ), Cosmetic Procedure Screening Questionnaire (COPS), and Body Image Concern Inventory (BICI). Other scales include the Appearance Anxiety Inventory, BDD Dimensional Scale, Body Image Disturbance Questionnaire, Body Image Quality of Life Inventory, Brown Assessment of Beliefs Scale, and the Yale Brown Obsessive Compulsive Scale modified for BDD as briefly described below.

Appearance Anxiety Inventory (AAI)

This scale can be used to assess the progress of patients throughout therapy and in research for BDD. One study showed that it has the psychometric properties to determine whether changes in behaviors and cognitive processes can mediate the outcome following treatment in patients with BDD. The questionnaire has 10 items, and the score ranges from 0 to 40 [35].

BDD Dimensional Scale (BDD-D)

BDD-D is a self-report scale with only 5 items and a total score that ranges from 0 to 20. It can be used as a measure tool during therapy [36].

Body Image Disturbance Questionnaire (BIDQ)

BIDQ is a self-report screening questionnaire for BDD that contains 7 items that measure appearance-related concerns [37, 38].

Body Image Quality of Life Inventory (BIQLI)

This questionnaire was validated for BDD. It measures quality of life related to body image [16, 39].

Brown Assessment of Beliefs Scale (BABS)

BABS is a widely used measure of assessing insight/delusionality in studies of BDD and OCD. In one study, this instrument was used in 327 subjects with BDD, and it was found to have strong interrater reliability, test–retest reliability, and internal consistency for the assessment of insight regarding appearance beliefs [40]. It is an observer-rated scale.

Yale Brown Obsessive Compulsive Scale Modified for BDD (BDD-YBOCS)

BDD-YBOCS is a 12-item scale with total scores that range from 0 to 48. This scale measures the severity of BDD symptoms and is rated by the observer [41].

Conclusion

Body dysmorphic disorder is a chronic and severe disorder that needs to be recognized amongst dermatologists, plastic surgeons, and those who provide aesthetic medicine and care. Patients with BDD have a preoccupation with an imagined or slight physical defect that causes clinically appreciable impairment in social, occupational, and/or other functioning. In addition, they exhibit repetitive behaviors or mental acts. In a small study of 59 dermatologists, 63 % were comfortable making a diagnosis of body dysmorphic disorder, and only 15 % of those queried believed that they could successively treat the disorder [42]. The correct diagnosis can be a challenge, as it may overlap or have similarities with other psychological conditions, such as depression, anxiety, eating disorders, social anxiety, and obsessive-

compulsive disorders. In addition, for those with slight abnormalities and mild disease symptoms, it may be very difficult to decide if the preoccupation is considered disproportionate. The new DSM-V now includes BDD under the section of obsessive–compulsive-related disorders, reflecting the increasing body of evidence that these disorders are somehow linked. In addition, the delusional variant of BDD is no longer coded as both delusional disorder and BDD. Rather, it is now diagnosed with a specifier indicating degree of insight. Although there is no single diagnostic tool that has been universally accepted, many self-report questionnaires and rating scales exist and can be used in clinical or research settings to identify and measure BDD symptoms.

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Chapter 8
Body Dysmorphic Disorder: Etiology and Pathophysiology

Allison Weiffenbach and Roopal V. Kundu

Introduction

Body dysmorphic disorder (BDD) is not the result of a single impairment, but it is rather the manifestation of multiple biological, psychological, and sociocultural factors. Several potential components involved in the development of BDD have been identified, yet the specific sequence of events ultimately leading to this disorder has been difficult to determine.

Several key factors play a role in the etiology and pathophysiology of BDD. First, biological factors, neuroanatomical differences specifically, impaired visual processing, neurotransmitter alterations, and genetic predispositions contribute to BDD. Psychological factors including childhood adversity, personality traits, and various learning theories also contribute. Finally, the roles of gender, culture, and media are important factors.

Part I: Biological

Neuroanatomy

Few studies have examined neuroanatomical differences that may underlie the pathophysiology of BDD. However, these studies have shown that morphological disturbances in neuroanatomy represent a component of the complex etiology leading to the

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development of BDD. Carey et al. used single-photon emission computed tomography (SPECT) on six subjects diagnosed with BDD to detect impairment of the frontostriatal and temporoparietaloccipital circuits [1]. Furthermore, damage to the temporal, parietal, and occipital lobes has been shown to disrupt normal body perception [2].

Other studies have utilized morphometric magnetic resonance imaging (MRI) to further examine anatomical differences between BDD and control patients [1]. These studies revealed a leftward shift in caudate asymmetry, greater total white matter volume compared to controls, and a positive correlation between BDD symptom severity and left inferior frontal gyrus and amygdala volume [3, 4]. The amygdala is associated with emotional reactions and fear conditioning [5]. It can communicate potential threats and also reacts to emotional facial expression [6]. In another study, 12 male BDD subjects measured smaller mean volumes of orbitofrontal cortex and anterior cingulated cortex, and larger mean white matter volume [7]. Altogether, these data suggest that the etiology of BDD involves a multifaceted neurological component.

Impaired Processing

The concept that individuals with BDD have impaired visual processing has been well studied. Patients with BDD tend to overfocus on details rather than global images [8]. One study detected abnormal left hemisphere activity in the lateral prefrontal cortex and lateral temporal lobe in subjects with BDD during all tasks involving non-self faces [9]. These areas are specialized for detail-focused visual processing.

Similar abnormal activity has also been studied in subjects with BDD during tasks utilizing images of their own faces and images of unrelated objects. Subjects with BDD have been shown to abnormally process their own face [10]. These studies have demonstrated hyperactivity in the left orbitofrontal cortex and bilateral head of the caudate for unaltered own-face studies, but a hypoactivation in the left occipital cortex for low spatial frequency own-face tasks [11]. The caudate has been implicated with voluntary movement, learning, memory, sleep, and social behavior [5]. It may be linked to repetitive behaviors, such as those seen in BDD rituals, and has been theorized to be dysfunctional in persons with obsessive–compulsive disorder [5, 6]. One study utilized the face inversion effect to determine that BDD subjects process objects in a piecemeal rather than global manner [11]. In this study, upside down faces were presented to subjects in order to delay the recognition time. There was less of a face inversion effect for BDD subjects than controls, indicating piecemeal analysis rather than global image processing. Furthermore, it has been shown that individuals with BDD have impaired visual processing when analyzing images of objects that are not faces [12]. These studies support the idea that BDD patients visually process their environment differently from non-BDD individuals. Impairment of multisensory integration has been suggested as another potential component of abnormal processing in BDD patients [13]. The relationship between parietal-occipital brain regions, multisensory integration, and the clinical features of BDD has also been reported previously [10, 13].

It is clear that the morphological brain features correlating with BDD symptomatology are complex, involving multiple brain regions and pathways. Research has revealed a potential relationship between a neuroanatomical defect and a resulting impairment in visual processing of the environment. This pattern of analysis leads to individuals overfocusing on small details, potentially the perceived flaws that help define this disorder.

Studies have also shown that BDD patients misinterpret and struggle to analyze emotional stimuli, including words, situations, and faces. These individuals overattend to specific emotional stimuli, such as BDD-related words [14]. In addition, patients with BDD interpreted various situations as threatening compared to controls and patients with OCD. In this study, social, general, and BDD-related situations were presented to subjects [15]. In a similar study, subjects had trouble identifying emotional expressions when asked to interpret scenarios involving themselves versus scenarios regarding other individuals. For example, subjects were asked to identify the facial expression of a bank teller looking at the subject compared to the bank teller looking at a friend. They often identified emotions as angry and contemptuous for the scenarios involving the subject, indicating that the individuals with BDD have poor insight when understanding how others view them [16]. In a separate study by the same group, BDD subjects repeatedly misidentified emotional expressions [17]. It is not clear how the misinterpretation of emotional stimuli relates to the development or maintenance of BDD. However, these studies suggest that patients with BDD view their environment as hostile, a feeling that could translate to unhappiness with their appearance.

Research has shown that patients with BDD are better able to detect subtle deviations in facial features when presented pictures that had been aesthetically manipulated [18]. BDD subjects were also better able to perceive deviations from normal appearance than control patients. These results suggest that patients with BDD have an increased sensitivity when it comes to detecting features associated with beauty, potentially explaining key components of this disorder regarding perceived flaws in one's appearance. One study focused on how the topographical organization of the brain relates to this impaired processing and BDD symptomatology. The study used MRI images to examine relationships between whole-brain and regional white matter organization and BDD clinical symptoms. It was found that there is a disturbance in the topography of whole brain organization, and that the degree of topographical deficits correlated positively with BDD severity. Furthermore, abnormal interhemispheric visual information transfer was observed in subjects with BDD, providing a potential link between the neuroanatomical disturbances and impaired visual processing seen in BDD [19].

Neurotransmitters

Many studies have also found a link between BDD symptoms and serotonin levels/5-hydroxytryptamine (5-HT) receptor activity. Serotonin inhibits aggressive

behavior, and its depletion is common in many psychiatric disorders such as obsessive–compulsive disorder, depression, and anxiety [5]. A 1987 case report described the relationship between dependence on cyproheptadine, a 5-HT2 antagonist, and development of BDD-related symptoms [20]. It has also been shown that 5-HT2 agonists can momentarily relieve BDD symptoms [21]. A separate case report found that dietary depletion of tryptophan, a precursor to serotonin, resulted in exacerbation of BDD, but not OCD, symptoms in a female subject who had been successfully treated with selective serotonin reuptake inhibitors (SSRIs) [22]. There have been several reports that treatment of BDD with SSRIs, specifically fluvoxamine, fluoxetine, escitalopram, and citalopram, is effective at alleviating clinical symptoms, supporting the importance of serotonin levels and the development or maintenance of BDD [23–26]. It has been shown that there is an abnormality at the level of the 5-HT presynaptic receptor, which is common to both BDD and OCD spectrum disorders [27].

Genetics

There is some evidence that there is a genetic predisposition for development of BDD. One study found that 8% of subjects with BDD have a relative with the disorder [28]. A separate study found that BDD occurred in 5.8% of first degree relatives based on the family history method [29]. This number is most likely an underestimate because BDD is often concealed from family members and can go unrecognized. There is also evidence of a genetic link between BDD and OCD. Family studies have shown that 7% of subjects with BDD have a first-degree relative with OCD [30]. Monzani et al. showed that shared genetic factors could explain almost two-thirds of the phenotypic correlation between BDD and obsessive–compulsive symptoms [31]. In contrast, environmental factors examined were distinct between the two groups. The genetic link was greater when looking at traits more intrusive in BDD, such as obsessive thoughts. This study established a potential genetic predisposition between development of BDD or OCD. An individual's unique environment may lead them to develop one disorder over the other.

Part II: Psychological

Childhood Adversity

Extensive research has shown that the children who experience various forms of childhood adversity, including bullying, teasing, and other forms of abuse, are more vulnerable to developing BDD. One theory is that a child becomes conditioned when viewing his or her body to negative feelings similar to those associated with the adversity [32]. Body image perception is impacted by multiple factors, including

appearance-related teasing and criticism [33]. Cash et al. found that adult women and men who were unhappy with their body had often been teased about their appearance during childhood [34]. There is a positive correlation between teasing in elementary-aged children and body dissatisfaction in adulthood [35]. A separate study found a positive correlation between the degree of teasing and a more negative body image [36].

In one small study, 79 % of the 75 BDD sufferers perceived that they had experienced childhood adversity in some way including emotional neglect (68 %), emotional abuse (56 %), physical abuse (35 %), physical neglect (33 %), or sexual abuse (28 %) [37]. Neziroglu et al. found that 38 % of the BDD subjects had experienced childhood abuse, which is lower than the 79 % reported by Didie et al. However, both studies found that emotional abuse was more prevalent than physical or sexual abuse [37, 38]. In contrast, a 2012 study found higher reported retrospective experiences of physical and sexual abuse during early life than emotional abuse [39].

Research has also focused on the role of images linked to early stressful memories in the development and maintenance of BDD. One study found that subjects with BDD frequently had spontaneously occurring appearance-related images or impressions that were more vivid and detailed than control subjects [40]. Furthermore, these images were often from an observer perspective, more negative, and reoccurred more frequently than control groups.

These data suggest that a history of emotional, physical, or sexual abuse can potentially contribute to developing BDD later in life.

Personality Traits

Certain personality traits and values, specifically perfectionism and aesthetic sensitivity, have been found to be more common in patients diagnosed with BDD. Furthermore, studies have found that the subjects with BDD are often also diagnosed with a personality disorder. The role of certain personality traits or disorders in the etiology of BDD is not fully understood, but these preliminary studies suggest a potential relationship.

Subjects with BDD often display perfectionist thinking, including distorted beliefs regarding attractiveness [41–43]. For example, they tend to view themselves as significantly less attractive than others [42]. Subjects with BDD often have a discrepancy between their ideal self and their actual self, which can lead to dissatisfaction and depression [44]. The self-discrepancy theory helps explain why they seek to camouflage and change their appearance in order to obtain this ideal self.

In addition to perfectionist thinking, these individuals often place a high level of importance on aesthetics [43, 45]. Subjects with BDD are more likely to pursue a career in the arts [45], underlying a potential relationship between BDD and an interest in art or design. One study found that subjects diagnosed with BDD overemphasize the importance of appearances and aesthetics [46]. This study found that subjects with BDD view themselves as an aesthetic object. Four main components

have been outlined in the concept of the self as an aesthetic object, two of which include self-focused attention and the lack of a self-serving bias [32]. Altogether, these factors enforce maladaptive behaviors that lead to severe dissatisfaction with one's appearance.

A diagnosis of BDD is often associated with Cluster C personality disorders [47]. These personality disorders are characterized as being anxious or fearful, and include avoidant personality disorder and obsessive–compulsive personality disorder (DSM 5). Avoidant personality disorder, which includes features such as fear of rejection and social anxiety, was the most common disorder associated with BDD. Subjects with BDD were also identified as being introverted and shy [47]. It is not clear if these personality disorders predispose individuals to BDD or are a result of BDD.

Learning Theories

Researchers have utilized multiple learning theories to understand the development of BDD. Classical conditioning has been used to describe how teasing and bullying, the unconditioned stimuli, may ultimately lead to the development of a conditioned response, such as feelings of anxiety [32]. In this model, the aversive response associated with the unconditioned stimulus (being bullied) is transferred to a conditioned stimulus (viewing a certain body part). The most prominent theory utilizes the cognitive behavioral model to explain the maladaptive behaviors and thought processes associated with BDD. In this model, individuals construct a distorted view of their appearance and consequently selectively attend to this image [48]. The aversive feelings subjects experience regarding their appearance may contribute to the etiology of this disorder [49]. Spontaneous, negative images potentially preserve this distorted self-view, which magnifies the subjects' overt attention to their appearance [40, 48]. This theory is further supported by research that demonstrates cognitive behavioral therapy as a viable treatment option for BDD [50].

Other studies emphasize reinforcement-based operant conditioning in the etiology of BDD. For many patients with BDD, appearance was one of the most reinforced qualities while growing up. Appearance was positively reinforced to the exclusion of other behaviors, a potential contributing factor to the development of BDD [32, 51]. Furthermore, negative reinforcement has been used to describe how certain behaviors characteristic of BDD are encouraged. Through negative reinforcement, certain maladaptive thoughts and feelings are temporarily decreased by avoidant and safety seeking behaviors [32]. Social learning theory has also been applied to the development of BDD. For example, a relationship has been shown between a daughter's current body image and her memory of her mother's body image [33].

Part III: Sociocultural

Gender

Beyond neurological and psychological factors, researchers have examined how gender, culture, and society might affect this complex disorder. Few studies have looked into gender differences in patients with BDD. The most recent study found more similarities than differences between men and women [52]. Similarities included the degree of appearance-related delusionality, age of onset, effects on quality of life, and functional impairment. Men were more often concerned with their genitals, body build, and hair thinning than females. In addition, men were more likely to have a substance abuse disorder. Females with BDD had appearance concerns regarding their skin, stomach, breasts, and buttocks. Furthermore, females had an earlier age of subclinical BDD symptoms and more severe BDD [52]. Some of these results are in agreement with other studies, but previously noted differences in living situations and height were not confirmed by the 2006 study [23, 53]. Future research is necessary to understand the relationship between gender and BDD.

Culture

Case reports and cross-cultural studies have examined the role of culture in the etiology of BDD. While culture influences the specific concerns a subject with BDD has regarding body parts, it does not appear to predispose someone to develop BDD [54, 55]. One study found similar prevalence rates of BDD between American (4 %) and German students (5.3 %) [56]. Furthermore, cases of BDD have been reported in a variety of countries, including the USA, Canada, Europe, China, Japan, and Africa [54, 57–61]. These case reports suggest that BDD is not specific to one country or culture. In fact, the Japanese diagnostic system includes a similar disorder of *shubo-kyofu* ("the phobia of a deformed body") [62]. Furthermore, the broad clinical features of BDD are similar across cultures. While a subject's culture may influence his/her specific concerns, there appears to be a deeper origin [54].

The Media

The role of the media in the development of BDD remains unclear. The media constantly reinforces the importance of appearance, while at the same time creating unrealistic expectations about beauty. Although a correlation between the media and BDD seems plausible, reports of BDD date back as far as the 1800s, prior to current media trends and the ideals it helps enforce [6]. Furthermore, many standards of beauty and attractiveness are established before individuals are influenced by the media [63, 64]. The media may enforce unrealistic beauty expectations and lead to the maintenance of BDD, but it most likely does not play a large role in the initial formation of BDD.

Conclusion

BDD is a complex disorder with multiple underlying factors. Research has demonstrated the role of several biological, psychological, and sociocultural components that contribute to this disorder. In addition, chance phrases, stressful life events, and cosmetic procedures can all act as triggering events for those already predisposed in some way to develop BDD. There remains a large gap in our understanding of how these specific factors predispose an individual to develop BDD. These risk factors most likely interact with one another throughout an individual's life. Future research should focus on these potential interactions in order to gain a better idea of what risk factors are fundamental to the etiology of BDD.

A better understanding of the underlying components unique to BDD will create a more concrete definition of this disorder, helping to distinguish it from other comorbidities. In addition, more knowledge on the etiology and pathophysiology of BDD will lead to better treatment options for this unique patient population.

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Chapter 9
Body Dysmorphic Disorder: Epidemiology and Specific Cohorts

Kavitha K. Reddy and Justin Besen

Introduction

Body dysmorphic disorder (BDD), a condition resulting in impairment due to preoccupation with a slight or imagined defect in cosmetic appearance, affects millions of individuals worldwide [1]. The affected person's surrounding network of friends, family, coworkers, health-care providers, and others are further impacted by the disease. Preoccupations with perceived physical defects lead individuals suffering from BDD to frequently present for consultation for invasive or noninvasive cosmetic services. Individuals with BDD also have a high prevalence of comorbid psychiatric disorders, including depression, anxiety, social phobia, and obsessive–compulsive disorder (OCD). Knowledge of the epidemiology of BDD, including risk factors and prevalence, allows greater understanding of the disease and promotes optimal detection with appropriate subsequent care.

In this chapter, we explore the epidemiology of BDD within the general population and specific cohorts. We review the studies that have investigated the prevalence of this condition within the USA and global populations. We will also examine the disease in relation to patients presenting to dermatology, cosmetic surgery, and rhinoplasty clinics to better understand the prevalence, presentation, and outcomes of BDD patients within this cohort. Finally, we will review the frequency of BDD in those with various psychiatric disorders, such as major depressive disorder, OCD, and eating disorders.

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BDD in the General Population: Prevalence and Demographics

The prevalence of body dysmorphic disorder (BDD) in the global population has been reported in most studies as approximately 2 % [1]. Studies have estimated prevalence as ranging from 0.7 to 2.4 % [2, 3]. More specifically, Koran et al. [3] found an overall point prevalence of 2.4 %, with 2.5 % in females and 2.2 % in males. Otto et al. [4] also studied the point prevalence of BDD in a community sample of 976 American women in the Boston, Massachusetts metropolitan area, aged 36–44 years. Using structured clinical interviews to diagnose BDD, they calculated a point prevalence of 0.7 %. In a study by Conrado et al. [1] that included 50 control patients presenting to a university orthopedic clinic, 2.0 % of the controls (a surrogate for the general population) were identified as having BDD. BDD may be up to four times more prevalent in those with first-degree relatives with the condition, indicating a possible genetic tendency, cultural influence, or possibly, both [5].

Most studies suggest no difference between genders in BDD prevalence, [1, 3, 6, 7] though many studies have a higher preponderance of female subjects. In addition, female and male symptomology appears to be quite similar. In regards to disliked body areas, types of repetitive behavior, comorbidity, and symptom severity, the genders are similar [8]. Nuances include men having more genital concerns and muscle dysmorphia, which almost exclusively occurs in males, and women more often having a comorbid eating disorder [8]. It has been found that men are likely to be single, have a drug or alcohol problem, and be worried about thinning hair, while women are more likely to use camouflaging, check mirrors, and pick at their skin [9].

Those with BDD present often to cosmetic dermatology or plastic surgery clinics, as well as to psychiatry clinics. The current prevalence is approximately 9–14 % among dermatology patients, 7–8 % among US cosmetic surgery patients, and 10 % among those presenting for oral or maxilofacial surgery [10].

In addition to a desire to correct the person's own perceived cosmetic defect, affected individuals may interestingly often also have an interest in aesthetics beyond their own appearance. A study comparing 100 BDD patients with 300 individuals with other psychiatric conditions found that 20 % of those with BDD were employed or educated in art and design. By comparison, this background was noted in only 4, 3, and 0 % of those with depression, anxiety, and posttraumatic stress disorder, respectively [11]. BDD patients were similarly described in another study as twice as likely to be employed as an artist when compared to the general population [5].

The prevalence in teenagers has been reported at 2.2 % [12, 13]. Inpatient adolescents may have rates as high as 33 % [2]. College students are also frequently affected. Higher rates of BDD have been observed in college students than in the general population, estimated at 2.5–10 %, [14, 15] and even as high as 13 % among American college students [5, 16]. This has been observed to be considerably higher than seen in international college students, and cultural influences may be a significant factor. For comparison, the prevalence of BDD in German college students has been reported at 5.3 % [5, 17] and Turkish undergraduates at 4.8 % [18].

In international populations, a similar BDD prevalence has been observed as that estimated in the USA. A study of 673 randomly selected individuals within the general population in Florence, Italy, determined the 1-year prevalence to be 0.7 % [19]. A German nationwide sample obtained a BDD prevalence of 1.8 % [6]. Table 9.1 compares studies that have evaluated the prevalence of BDD in community samples and undergraduate populations within the USA and internationally.

Development and Course

BDD patients present commonly as adolescents and young adults, and also frequently up to the individual's mid-30s and 40s. The mean age of onset is 16–17 years, and the most common age at onset is 12–13 years [8, 20]. Although patients may present at a later age, the majority (approximately two thirds) will have the onset of symptoms before the age of 18 [8]. The disorder is usually not formally diagnosed until 10 to 15 years after the onset of BDD [21, 22]. Although some may experience an abrupt onset of BDD, the disorder usually evolves gradually [23]. The disease can be severe and is often chronic. Clinical features appear similar among all age groups; however, those with an earlier age of onset are more likely to have comorbidity and suicidal ideation [24].

BDD characteristics in children and adolescents are quite similar to those of adults. More youths than adults attempt suicide, however, 44 % compared to 24 %, respectively [23]. Youths also tended to have more delusional beliefs, lifetime violence, suggesting that they may be more impaired [23]. Those who develop BDD at an earlier age are more likely to be psychiatrically hospitalized, have a substance use disorder, and attempt suicide[23]. It is important to recognize BDD in younger persons, as long-term academic, relationship, and occupational problems can be incurred without proper treatment. Unfortunately, diagnosing BDD in children and adolescents is quite difficult because this is a time in development that many bodily changes occur and appearance concerns are quite common [9].

Body Dysmorphic Disorder in Dermatology and Cosmetic Dermatology Patients

It has been reported that BDD patients are more likely to visit dermatology or plastic surgery providers than psychiatry providers, due to poor insight into the condition and preoccupation with a desire to physically intervene in an effort to improve their feelings about their appearance [25]. In the clinical dermatology setting, studies have estimated a prevalence of BDD of 9–14 %. Within the cosmetic surgery setting, the prevalence ranges from 3 to 53 % (see Table 9.1) [26–35]. With over 11 million cosmetic surgeries performed in the USA in 2013, 83.5 % of which were minimally invasive, it is important for clinicians to recognize those patients who

Table 9.1 Studies of BDD prevalence among various populations

Authors and year	Country	Population	BDD prevalence (%)
Koran et al. 2008 [3]	USA	Nationwide sample	2.4
Otto et al. 2001 [4]	USA	Community	0.7
Buhlmann et al. 2010 [6]	Germany	Nationwide sample	1.8
Faravelli et al. 1997 [19]	Italy	Community sample	0.7
Callaghan et al. 2011 [14]	USA	Undergraduates	10.1
Biby 1998 [16]	USA	Undergraduates	13
Bohne et al. 2002 [17]	Germany	Undergraduates	5.3
Sarwer et al. 2005 [15]	USA	Undergraduates	2.5
Cansever et al. 2003. [18]	Turkey	Undergraduates	4.8
Sarwer et al. 1998 [28]	USA	Cosmetic surgery	7
Vargel et al. 2001 [32]	Turkey	Cosmetic surgery	20
Ishigooka et al. 1998 [31]	Japan	Cosmetic surgery	15
Vindigni et al. 2002 [30]	Italy	Cosmetic surgery	53.6
Aouizerate et al. 2003 [27]	France	Cosmetic surgery	9.1
Crerand et al. 2004 [33]	USA	Cosmetic surgery	8
Castle et al. 2004 [34]	Australia	Nonsurgical cosmetic	2.9
Conrado et al. 2010 [1]	Brazil	Cosmetic dermatology	6.7
Droguk-Kacar et al. 2014 [25]	Turkey	Cosmetic dermatology	4.2
Phillips et al. 2000 [35]	USA	General dermatology	11.9
Uzun et al. 2003 [29]	Turkey	General dermatology (acne)	8.8
Conrado et al. 2010 [1]	Brazil	General dermatology	14
Droguk-Kacar et al. 2014 [25]	Turkey	General dermatology	8.6
Veale et al. 2003 [41]	UK	Rhinoplasty	20.7
Alavi et al. 2011 [40]	Iran	Rhinoplasty	24.5

may be suffering from BDD to avoid unnecessary procedures that may not ultimately improve cosmetic satisfaction [36].

BDD patients presenting for cosmetic treatment consultation can be difficult to treat, often demanding unnecessary medical or procedural treatments due to their distress and fixation with the perceived defect [1]. In a cohort of 289 individuals with BDD, Phillips et al. [37] reported 76.4 % sought nonpsychiatric treatment and 66.0 % actually received it. Within this cohort, 38.2 % requested treatment from more than one type of provider. Dermatologic treatment was the most commonly received treatment (45.2 % of the adults), followed by surgery (23.2 %). Cosmetic treatment unfortunately often does not provide relief, and the majority of BDD patients are dissatisfied with their dermatological or cosmetic treatments [1]. In one study, 61.4 % reported no change after a procedure. [5]. Associated litigious or other threats are not uncommon, and these individuals may be more likely to resort to aggression or even violence if their concerns are not heard or treatment is believed to be unsatisfactory. One survey of adolescent patients with BDD found that 38 %

had a history of violent behavior, which may be an overestimate but provides an indication of the associated distress and comorbid psychiatric disease affecting the patient [5].

Studies have evaluated specific cosmetic treatments and found BDD in 23 % of the 13 patients desiring botulinum toxin (Botox®) for hyperhidrosis [38]. Botulinum toxin injections and collagen fillers were not approved for use in the USA until the early 2000's. Some of the earlier studies of cosmetic clinic cohorts excluded, or did not capture, these treatments, and there is some speculation that the previously reported prevalence may underestimate the current prevalence rates [1].

In a 2009 cross-sectional Brazilian study [1], 150 general and cosmetic dermatology patients, and 50 controls were interviewed by clinical psychologists and surveyed for the presence of BDD. The study determined that the prevalence of BDD was higher in the dermatology groups ($n=31$), as compared to the control group ($n=1$). Cosmetic dermatology patients were further significantly more likely to have BDD than their general dermatology counterparts, with a BDD diagnosis in 14 % compared with 6.7 % of general dermatology patients. Cosmetic BDD patients were more likely to be single and have a lower BMI than the general dermatology and control groups. Additionally, those in the cosmetic dermatology group were more likely to have undergone either minimally invasive procedures or cosmetic plastic surgery and to currently be under treatment as compared to general dermatology patients. Importantly, 61.9 % of the cosmetic patients with BDD were dissatisfied with treatment results, as compared to 10 % of the general dermatology group [1].

Similarly, a cross-sectional Turkish study in 2013 [25] also evaluated the frequency of BDD in cosmetic and general dermatology settings. Subjects were screened for BDD using a self-report questionnaire. Of the 318 subjects, 151 of which were cosmetic and 167 general dermatology patients, a total of 20 (6.3 %) were diagnosed with BDD based on questionnaire results. The investigators again saw trends toward higher BDD prevalence in the cosmetic dermatology group as compared to general dermatology, with a BDD prevalence of 8.6 % as compared to 4.2 %, respectively [25]. Demographic analysis showed BDD patients were on average significantly younger than non-BDD subjects, with no differences in gender. None of the BDD patients were satisfied with their treatment results, echoing the findings in the Brazilian cohort.

Studies suggest that the most common complaints from BDD patients involve facial defects, such as skin blemishes or nasal shape. Patients may present with any one or more of a variety of distressing concerns, including hair loss or hypertrichosis, abnormalities in pigmentation, pore size, vessel pattern, pallor, reddening of the skin, concerns related to hyperhidrosis, genitalia size, muscularity, breast size or shape, and/or buttock shape [2, 5]. In the Turkish study described above, the BDD population was most concerned with body shape and weight (40 %), followed by acne (25 %).

Rhinoplasty Patients

Cosmetic rhinoplasty has been reported to be one of the most requested procedures in patients with BDD [39]. There is a high prevalence of BDD patients in rhinoplasty clinics compared to the general population. The prevalence of BDD has ranged from 20.7 to 24.5 % in those seeking rhinoplasty surgery (see Table 9.1) [1, 40, 41].

In a comparison of BDD patients in a psychiatry clinic requesting rhinoplasty and those without BDD who had undergone successful cosmetic rhinoplasty, the BDD patients were found to be significantly younger, more depressed, and anxious [41]. They also had a greater preoccupation with their nose and were impaired in professional and social spheres of life due to cosmetic nasal appearance concerns [2].

Picavet et al. [39] evaluated the prevalence of BDD and its clinical features in a Belgian cohort of patients seeking evaluation by otolaryngology (ENT) providers in consultation for rhinoplasty. Subjects were administered questionnaires to assess compulsivity and disruption of daily living secondary to appearance. Moderate or more severe BDD symptoms, as evaluated by the questionnaire, were observed in 33 % of rhinoplasty patients. After stratifying by the reason for rhinoplasty consultation, this increased to a 43 % prevalence rate in those seeking rhinoplasty for aesthetic concerns, compared with 12 % for those seeking rhinoplasty to correct a reported functional defect. In a control group of individuals presenting for other otolaryngology concerns, only 2 % were found to have at least moderate BDD symptoms, which correlates with estimates for the general population. The authors found a significant correlation between BDD severity score and history of previous rhinoplasty, psychiatric history, and reason for surgery (aesthetic versus functional). No correlation was found between the patient-completed BDD symptom questionnaire and objective nasal evaluation by a physician. However, an inverse correlation was observed between the BDD symptom questionnaire and patient-reported nasal evaluation. This supports the current disease model that it is the patient's perception of a defect, rather than the severity of the actual defect, that drives the symptoms of BDD.

Body Dysmorphic Disorder and Associated Psychiatric Diseases

BDD shares significant overlap with other psychiatric disorders, particularly anxiety, depression, eating disorders, and obsessive–compulsive disorder (OCD). In patients receiving psychiatric treatment, 3.2 % of the outpatients and up to 12.1 % of the inpatients have been reported to have a BDD diagnosis [2, 3, 42]. The prevalence is approximately equivalent in males and females in outpatient psychiatric patients [2].

Depression and Anxiety

Most studies indicate comorbid depression and social phobia in more than 70 % of BDD patients [2]. Comorbid major depression in BDD patients has also been reported as high as 80 % [43]. Rates of coincident anxiety disorder in BDD patients are also high, with 38 % reporting a lifetime history of social phobia and 60 % reporting any anxiety disorder [2]. In those with a primary diagnosis of social phobia, studies have reported comorbid BDD in approximately 11–12 % [44, 45]. Rates of BDD in primary atypical depression range from 13.8 to 14.4 % [43, 46]. Comorbid psychiatric disease along with BDD can significantly negatively impact a patient's quality of life and interactions with others. BDD patients can be sensitive to rejection and, may at times, have difficulties sustaining personal and professional relationships. This is supported by studies indicating that BDD cohorts are more often single, separated, and/or unemployed [2, 12, 47].

Nierenberg et al. [43] assessed for BDD in 350 consecutive drug-free outpatients diagnosed with major depression that were entering an anti-depressant treatment study. This cohort was evaluated through a structured clinical interview performed by a psychiatrist. Subjects were additionally assessed for depression severity and degree of social functioning. Study aims included determination of the prevalence of comorbid BDD in the cohort of major depression patients, as well as a comparison of demographics and clinical variables between the BDD and non-BDD groups. The authors found that 8 % had a lifetime history of BDD, whereas 6.6 % had current BDD. The rate of BDD was higher in those with atypical depression at 14.4 %, as compared to more typical depression at 5.1 %. These numbers were consistent with prior studies. BDD subjects with depression also reported an earlier age of depression onset (17.4 vs. 26.5 years) and longer duration of depressive episodes (6.2 vs. 3.1 years), but no difference in number of depressive episodes when compared to those without BDD. Patients with BDD and depression also had significantly higher rates of additional psychiatric disorders, including social phobia, eating disorders, somatoform disorders, and avoidant, histrionic, and dependent personality disorders [43]. BDD patients with depression were further confirmed in additional studies to often have an earlier onset and more chronic depression, worse psychosocial functioning, and higher risk of suicidal attempts [5, 43].

In the context of the aforementioned psychiatric conditions, BDD patients also have high lifetime rates of inpatient psychiatric hospitalization, estimated at 48 %. Suicidal ideation rates range from 45 to 82 % and suicide attempts occur in 22–24 %. The risk of completed suicide in BDD patients is approximately 45 times higher than general US population, raising significant concern for safety and well-being [2]. Among BDD patients, women preoccupied with perceived facial defects were found to have the highest risk of suicide [5].

Obsessive–Compulsive Disorder

Obsessive–compulsive disorder (OCD) is a chronic condition in which sufferers are subjected to persistent, intrusive thoughts or impulses (obsessions) and repetitive behaviors performed to attenuate the associated anxiety (compulsions). Body dysmorphic disorder is highly associated with OCD and is now newly listed as an obsessive–compulsive-related disorder in DSM-V. The lifetime prevalence of OCD has been estimated at 1.1–3.9 % in the general population [48]. Psychiatric comorbidities such as anxiety and depressive disorders have been found in 32–92 % of OCD patients. OCD is similar to BDD in that patients are also plagued by intrusive preoccupations and behaviors aimed to relieve these distressing thoughts, such as mirror checking or skin picking [48]. Additionally, OCD and BDD are both characterized by an early age of onset, chronic course, similar male to female ratio, and response to selective serotonin reuptake inhibitors (SSRIs). However, BDD patients are thought to have less insight into their disease; that is, they are more likely to be convinced that the belief in their physical defect is accurate rather than a mental disorder [2, 48].

Several smaller studies have estimated the prevalence of concomitant BDD and OCD to range from 3 to 37 % [13, 48, 49]. Similarly, 26 % of the patients with primary trichotillomania had comorbid BDD [50]. A larger cross-sectional Brazilian study of 901 OCD patients aimed to assess the prevalence of comorbid BDD and OCD and to further investigate the demographics and clinical features of this population as compared to OCD patients without BDD [8]. Diagnosis of BDD was determined by clinical interviews with psychologists or psychiatrists. Investigators determined that within the population of OCD patients, there was lifetime prevalence of comorbid BDD of 12.1 % and concurrent BDD of 11.4 %. Over one third of the BDD patients (38 %) had poor insight into their disease. On average, the OCD–BDD patients, when compared to their OCD-only counterparts, were younger and more likely to be single, unemployed, and/or without children. In addition, OCD–BDD patients were found to have an earlier age of OCD onset; more frequent history of skin picking; greater severity of obsessive compulsive, depressive, and anxiety symptoms; and more frequent comorbid social phobia, dysthymia, anorexia nervosa, and/or bulimia nervosa [48].

Eating Disorders

A number of small studies have evaluated the prevalence of BDD in those with eating disorders (ED). Kollei et al. [51] evaluated 90 patients with either anorexia nervosa or bulimia nervosa and found 12 % fit diagnostic criteria for BDD [2]. Another study found 39 % of anorexia nervosa patients had comorbid BDD. This cohort of anorexia–BDD patients also were observed to have poorer global functioning and higher rates of suicide attempts and hospitalizations [42].

A larger Dutch study [42] evaluated the prevalence of BDD in a cohort of ED patients, in order to compare the severity of ED and BDD symptoms, general psychopathology, number of comorbid Axis I disorders, and perceived quality of life in ED versus ED–BDD patients. Using self-report questionnaires to identify BDD patients, the investigators determined 45 % of the 158 participants screened positive for BDD. ED–BDD patients had significantly worse eating disorder psychopathology, dysmorphic appearance concerns, and dissatisfaction with a larger number of body parts than patients with an ED alone. Most of the BDD preoccupations involved weight and body shape, as opposed to facial or skin concerns [42]. The study included 97 % females, making the conclusions most applicable to women.

Conclusion

Knowledge of the epidemiology and characteristics of BDD within the general population and in specific demographic cohorts aids significantly in optimal and thorough evaluation of a patient prior to dermatology or cosmetic surgery interventions, allowing more optimal satisfaction and outcomes for the patient and care team. Once BDD is suspected, the diagnosis can be further explored and confirmed. However, it is thought that actual prevalence of BDD is underestimated [26]. This may be secondary to feelings of shame and embarrassment by the patient. Only 15.1 % of psychiatric inpatients discussed body image concerns with their provider, with approximately a third citing embarrassment as their reason for nondiscussion [52]. As we have seen, BDD patients are at a higher risk for additional psychiatric disorders, including depression, anxiety, social phobia, obsessive compulsive, and eating disorders. While patients with BDD frequently consult dermatologists and plastic surgeons for treatment options, they are best served by recognition of their disorder and involvement of a multi-disciplinary care team that includes experts in psychiatry to help them cope with this condition.

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Chapter 10
Body Dysmorphic Disorder: Effects of Aesthetic Treatments and Implications for the Dermatologist and Cosmetic Surgeon

Yakir Levin and Emmy M. Graber

Background

The prevalence of body dysmorphic disorder (BDD) in patients seeking dermatologic care is higher than in the population at large. Patients with BDD seek cosmetic treatments in order to ameliorate perceived shortcomings in their appearance; frequent concerns include skin elasticity, skin color, and perceived imperfections such as acne, scars, and cellulite. Men and women with BDD are equally likely to receive cosmetic treatment, different from the general population in which women are generally more likely to obtain aesthetic care [1]. It is estimated that 6–15 % of patients in cosmetic surgery settings have BDD, and similarly 12 % of patients in the general dermatology setting have the condition [2]. Due to the prevalence of BDD in all dermatology settings, both cosmetic and general dermatologists should be sensitive to and aware of this condition. Dermatologists should develop an approach to patients in whom they suspect the presence of this psychiatric condition and should be aware of potential consequences of treatment.

Outcomes of Nonpsychiatric Treatments

Although data is mixed, patients experiencing negative psychological outcomes are a documented phenomenon following cosmetic surgery. In a survey sent to 702 plastic surgeons (of whom 281 replied) concerning all patients (not only those with BDD), Borah et al. [3], found that the physicians frequently observed several mood

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disorders in patients postoperatively. Patient anxiety reactions were commonly encountered by 95.4 % of surgeons, and disappointment (96.8 %), depression (95 %), and sleep disorders (88.5 %) were also frequently seen. These were more prevalent than physical complications such as hematoma and infection.

BDD has been identified as a risk factor for poor outcomes (as perceived by the patient) in cosmetic surgery. In a literature review of psychological and psychosocial outcomes for patients seeking cosmetic surgery (including mammoplasty, rhinoplasty, and facelift), Honigman et al. [4] reported that most patients were satisfied with the results of their procedures but a minority were not. The authors were limited by the lack of rigorous statistical evaluation in the studies that they reviewed, as well as a lack of uniform terminology across the studies. However, they identified several factors that appeared to be associated with poor outcome. These included demographic factors (male sex and younger age), psychological factors (history of depression or anxiety, of personality disorder, or of BDD), relationship factors (the belief that cosmetic surgery would save a relationship or a disagreement between partners on the necessity for the procedure), unrealistic expectations regarding the outcome of the cosmetic procedure, a previous surgical procedure with which the patient was dissatisfied, and the presence of minimal deformity at outset (a possible indicator of underlying BDD).

Physicians have some awareness of BDD and possible negative outcomes. In a survey of members of the American Society for Aesthetic Plastic Surgery, Sarwer [5] reported that the 265 respondents believed that an average of 2 % of patients seen for initial cosmetic surgery consultation suffer from BDD; and 84 % of respondents indicated that they had operated on a patient whom they believed was appropriate for surgery, only to realize after operation that the patient had BDD. Of these surgeons, 82 % believed that these patients had a poor postoperative outcome. However, only 30 % of respondents indicated that they believed BDD was always a contraindication to cosmetic surgery.

Negative psychological outcomes for cosmetic procedures in general are common, and BDD has been identified as a risk factor for this. While physicians are aware of the condition, they sometimes suspect it only after having performed a cosmetic procedure. It is therefore important to determine more specifically what the consequences of cosmetic intervention are in patients with BDD and to change clinical practice when indicated. The frequent presence of comorbid psychiatric conditions further amplify this concern; BDD has been associated with depression, anxiety, obsessive–compulsive disorder, eating disorders, schizophrenia, personality disorder, and social phobia [6–8].

Phillips et al. [1] studied a retrospective cohort of 289 individuals with BDD (by DSM-IV criteria) who had been referred for psychiatric treatment, of whom 250 were adults and 39 were children/adolescents. A majority of adults (76.4 %, $n = 191$) had previously sought nonpsychiatric treatment for their perceived appearance flaws. Of these, 165 received nonpsychiatric treatment (86.4 % of those who sought it). Approximately one-third (35.6 %) of all requested treatments were not received. The most common reason for this was the physician considering the treatment

Table 10.1 Patients' perceptions of effects of cosmetic treatments in two retrospective cohorts. Note that for the study by Phillips et al., total number of responses regarding overall BDD symptoms was 453. For appearance of the treated body part, it was 290. The assessments regarding overall BDD symptoms and appearance of the treated body part were made at different times during the study and therefore had different response rates

	Phillips [1] $N=453/290$	Crerand [9] $N=419$
Appearance of treated body part		
Improved	23.1 %	26.7 %
No change	61.4 %	68.2 %
Worse	15.5 %	5.1 %
Overall BDD symptoms		
Improved	11.7 %	3.6 %
No change	72.0 %	91.0 %
Worse	16.3 %	5.4 %

unnecessary (76.2 %). In those instances in which treatment was received, the most frequent treatment outcome was no change in overall BDD severity (72.0 %). BDD severity worsened in a further 16.3 %, while only 11.7 % of treatments resulted in improvement. Regarding change in concern with the treated "defective" body part, 23.1 % resulted in improvement, while 61.4 % of treatments resulted in no change and 15.5 % resulted in worsening of concern. Only 7.3 % of all treatments led to decrease in concern with the treated body part and overall improvement in BDD.

Crerand et al. [9] retrospectively evaluated surgical and minimally invasive treatment histories of 200 persons with BDD. Treatment was sought by 71 % and was received by 64 %. Symptoms of BDD improved after only 3.6 % of treatments, while they were unchanged in 91 % and worsened in 5.4 %. Patients reported improvement in the appearance of the treated body part after 26.7 % of treatments. This did not result in improved concern about the treated body part for all of these patients, however, because concern about the treated body part improved in only 17.7 %, while it was unchanged in 75.5 % and worsened in 6.8 %. Table 10.1 summarizes patients' perception of the effects of cosmetic treatments on the treated body part and on their overall BDD symptoms. In prospective data, those who had aesthetic treatment during a follow-up period were not more likely to have improvement in BDD symptoms than those who did not have cosmetic treatment [10].

Crerand subsequently reported in greater detail on the same cohort of patients [11]. The authors specifically investigated the possibility of outcome differences between surgical, minimally invasive (MI), and "other" procedures. There were too few MI procedures to perform a three-way comparison; the authors therefore performed two separate statistical analyses, one in which surgical and MI procedures were pooled (surgical/MI) and compared to "other" procedures, and a second in which surgical procedures were compared to MI and "other" (MI/other) procedures. Despite the somewhat arbitrary distinction between MI and "other" procedures, the authors found a statistically significant difference between the surgical/MI group and the "other" group in improvement in preoccupation with the treated body part

(25.3 % versus 15.6 %, $p = 0.04$). There was no significant difference in perceived improvement in appearance of the treated body part (33.3 % versus 24.8 %, $p = 0.11$) or in improvement of overall BDD symptoms (2.3 % versus 4.0 %, $p = 0.75$). In the surgical versus MI/other comparison, surgical interventions were more likely to result in improvement in preoccupation with the treated body part (27.9 % for surgical versus 15.9 % for MI/other, $p = 0.023$) and trended toward greater improvement in perceived appearance of the treated body part (36.1 % versus 24.9 %, $p = 0.069$). There was no difference in overall BDD symptom severity (1.6 % versus 4.0 %, $p = 0.368$). While the authors found some differences in outcome depending on the type of procedure that was performed, the outcomes were nonetheless poor across all types of procedures.

Veale et al. [8] described patients who had been referred to them by consultant psychiatrists, dermatologists, and cosmetic surgeons, or who had self-referred. Of those who were assessed over a period of 9 months and who met criteria for BDD, 48 % had seen either a cosmetic surgeon or dermatologist at least once, and 26 % had undergone one or more operations on their perceived defect. About 81 % rated themselves as dissatisfied with the outcome of the consultation or operation.

Veale [12] subsequently reported on 25 patients with BDD who at the time of psychiatric assessment had reported that they had previously had cosmetic surgery. The patients had undergone a total of 46 operations. Several patients reported performing their own cosmetic surgery because they had been turned down by a physician or because they could not afford it. Satisfaction after a first cosmetic procedure was an average of 3.9 on a scale of 0–10, and this decreased to 2.8 after a second and third procedure. Three patients claimed that they were not preoccupied by their appearance prior to surgery, and their symptoms of BDD developed only after a procedure that they believed to have been performed poorly.

Even when patients have been satisfied with the results of cosmetic procedures, preoccupation can transfer to a different body part. In Veale's [12] study, four of the six patients who rated themselves satisfied went on to have additional procedures or were dissatisfied with another area of their body. In a separate study, Tignol et al. [13] noted that five of seven patients who had undergone cosmetic surgery were preoccupied with a new body site at 5-year follow-up.

Suicide attempts have also been reported in association with BDD, although there is little to suggest that these were consequences of or even temporally related to cosmetic treatment of perceived deformity. Cotterill and Cunliffe reviewed a series of 16 patients who committed suicide at some time after presenting with dermatological problems to their dermatologic clinic. Of these, three had been diagnosed with BDD at initial presentation [14]. In Veale et al.'s [8] cohort of 50 patients, 24 % reported prior suicide attempts. One patient who had been referred with suspected BDD committed suicide prior to evaluation and was therefore not included in the cohort. Phillips et al. [15] reported an annual suicidal ideation rate among patients with BDD of 57.8 % and a mean annual suicide attempt rate of 2.6 %.

Additional Implications for Dermatologist

BDD patients often engage in compulsive behaviors such as skin picking, hair plucking, scratching, application of harsh chemicals, and at-home procedures to cope with, or attempt to correct, their perceived physical defects [16]. In one extreme example, a patient's preoccupation and picking of a skin defect on her neck was so extreme that she exposed her carotid artery through extensive manipulation [17]. These behaviors may be the presenting sign of BDD, and dermatologists should be aware of this and be prepared to work with or refer to a psychiatrist for treatment of the underlying condition. In addition, dermatologists should be prepared to treat the sequelae of these behaviors, including bleeding, scarring, and infection.

The best interest of the patient is always of greatest concern to the treating physician. The discussion above has focused on outcomes of cosmetic treatments from the perspective of the patient with BDD. However, there are potential consequences to the treating physician as well. These include threats of litigation and, even, violence.

In one survey of cosmetic surgeons, 40 % of respondents indicated that a patient with BDD had threatened them legally (29 %), physically (2 %), or both legally and physically (10 %) [5]. Lawsuits have been executed by patients who have alleged substandard surgical technique. Additionally, in one case (although subsequently dismissed), a patient filed suit, claiming that informed consent had not been obtained because such consent is not possible in the setting of BDD [18]. In interviews of 58 consecutive patients with BDD, Perugi et al. found that 30 % reported to be more aggressive and violent toward their relatives and friends [19]. In an assessment of 33 child and adolescent patients with BDD, 38 % reported having committed violent acts associated with their BDD toward themselves or others [20].

Lucas [21] reported on a patient whose preoccupation with his skin began at age 12 and manifested over a period of years by overdose on oral acne medication, frequent showering, social withdrawal, hospitalization, refusal to go out during the day, and threat of suicide. He was formally diagnosed with BDD at age 24. The patient also manifested aggressive behavior toward others. This behavior included stabbing a fellow employee with a screwdriver at age 24, assaulting his mother at age 25 (and conviction of causing bodily harm), assaulting staff at his residential unit (bail hostel) following that conviction, and destructive behavior when subsequently incarcerated. In this case, in addition to his diagnosis of BDD, the patient fulfilled criteria for paranoid personality disorder and also manifested avoidant and narcissistic personality traits.

Phillips reported a case of a plastic surgeon being attacked with a knife by a patient who was dissatisfied with his surgical outcome and a case of a patient who attempted to murder his dermatologist because of a treatment that he believed to have been ineffective [10]. Cotterill mentions the murders of one dermatologist and two plastic surgeons in Britain but does not discuss the details of the cases [22]. Several other authors make reference to reports of violence directed toward physicians but do not include detailed information about coexisting psychiatric issues that may increase the likelihood of violence [22, 23].

Conclusions and Recommendations

The studies on outcomes of nonpsychiatric treatments of patients with BDD reviewed in this chapter have some weaknesses. These include retrospective data, a selection bias of patients in favor of treatment failures, and the absence of a control group of psychiatric patients who had undergone cosmetic surgery but who did not have BDD. Additionally, it is difficult to draw conclusions about the potential effectiveness of one type of procedure versus another because of the relatively small number of patients involved. Nonetheless, there is substantial evidence that nonpsychiatric treatment of patients with BDD does not result in improvement of the underlying psychiatric condition or even of the patient's concern with the particular perceived physical ailment. While concerns regarding the particular affected area do sometimes improve, this is often temporary, and they can also become worse. In addition, new areas of supposed deformity can arise after a cosmetic treatment. While quantitative and comparative data with other psychiatric conditions are lacking, the possibility of litigious or violent behavior toward the physician by patients with BDD amplifies the risk to the physician. For these reasons, nonpsychiatric treatment of BDD and of perceived physical imperfections in the setting of BDD is increasingly seen as contraindicated. Evidence shows that dermatologists and plastic surgeons are increasingly not performing treatments on those suspected to have BDD. Approximately 30 % of all requested cosmetics treatments and approximately half of all surgical requests were not received, with the most common reason being that the doctor considered the treatment unnecessary and did not provide it [1, 9, 10]. In addition, 84 % of aesthetic surgeons reported that they had refused to operate on someone due to BDD concerns [5].

Although dermatologists are not formally trained in the diagnosis and treatment of BDD, a dermatologist is likely to be the first physician encountered by the patient and may be the first to suspect the presence of this disorder. Formal guidelines adopted by the British National Institute for Health and Care Excellence (NICE) recommend that for patients with mild disfigurements or blemishes who are seeking a cosmetic or dermatological procedure, health-care professionals should routinely consider and explore the possibility of BDD. Patients should be assessed by a mental health professional with specific expertise in the diagnosis and management of BDD [24]. Some authors [14] suggest referral to a multidisciplinary clinic (if available) that includes dermatologists and psychiatrists. Such a clinic can evaluate patients with suspected BDD as well as those with true dermatologic disease that has significant psychiatric impact. In the absence of a collaborative clinic, referral of a patient with suspected BDD to a psychiatrist or psychologist with knowledge and expertise in this condition is appropriate [25]. Screening methods (see Chap. 11) may be of use for dermatologists who do not have access to real-time expert consultation with a psychologist or psychiatrist [26, 27] so that appropriate referral can be made.

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Chapter 11
Body Dysmorphic Disorder: Screening Patients and Associated Algorithms

Amanda Champlain and Anne Laumann

Introduction

Body dysmorphic disorder patients seek treatment from dermatologists and plastic surgeons instead of psychiatrists for their psychiatric condition [1]. Body dysmorphic disorder is estimated to occur in 0.7–3 % of the general population [2–5]; however, multiple studies have suggested an incidence of 6–16 % in patients seeking aesthetic medical treatments [6–12]. Studies assessing body dysmorphic disorder in patients presented to dermatology clinics for a variety of conditions report rates between 8.8 and 15.2 % [13–16]. A psychiatric study of 188 patients with body dysmorphic disorder revealed 86 (46 %) patients had sought dermatologic treatment and 54 (29 %) patients had received surgery [17]. These figures imply that busy dermatology and aesthetic surgery practices may come across many individuals with body dysmorphic disorder each month [18].

Retrospective studies and case series have described poor outcomes in patients with body dysmorphic disorder who receive cosmetic surgery or other aesthetic medical treatments [17, 19–22]. A study of 289 patients with body dysmorphic disorder showed 66 % had received nonpsychiatric treatments for their perceived defect most frequently resulting in no change or worsening of body dysmorphic disorder severity [19]. A smaller study evaluating body dysmorphic disorder patients receiving surgical and/or minimally invasive procedures (such as collagen injections or microdermabrasion) reported long-term improvement in body dysmorphic disorder symptoms in only 2.3 % [20]. Though prospective outcome studies are lacking, the consensus in published literature is to avoid elective dermatologic treatments and surgical procedures in people with body dysmorphic disorder [18, 23–26].

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Other reported challenges include violence and legal action towards the treating clinician and self-harm [1, 18]. A survey of aesthetic plastic surgeons revealed 29 % had been legally threatened, 2 % had been physically threatened, and 10 % had received both legal and physical threats from a patient with body dysmorphic disorder [24]. Body dysmorphic disorder is one of the most deadly psychiatric conditions with 25 % of individuals attempting suicide [17]. In a prospective study of 185 body dysmorphic subjects, the completed suicide rate was 45 times higher than that in the general population [27]. A case series of patients who presented to a dermatology clinic and subsequently committed suicide mostly had acne or a body image disorder [28].

It is important to recognize body dysmorphic disorder to avoid prescribing treatments or performing procedures in those with the disorder and to refer them to a mental health professional who can provide appropriate therapy. This chapter describes methods for clinicians to screen for body dysmorphic disorder within their patient population utilizing behavioral observation, interview, and structured surveys.

General Guidelines and Behavioral Observations

The vague, subjective criteria used to define body dysmorphic disorder, as well as its inherently secretive nature, make it a difficult entity to detect. While there are questionnaires and structured screening tools available, there is tremendous value in a clinician's close attention to the patient's history, interview, and behavior for red flags signaling body dysmorphic symptoms.

It is advisable to routinely collect a psychiatric history as part of the medical history. Thirty percent of cosmetic surgery patients reported a mental health history versus 4 % of non-cosmetic plastic surgery patients [18]. About 18–50 % of cosmetic surgery patients report taking psychiatric medication compared to 5 % of non-cosmetic surgery patients [18, 29]. Body dysmorphic disorder patients frequently suffer from other psychiatric comorbidities including depression, obsessive-compulsive disorder, personality disorders, phobias, eating disorders, and gender identity disorders [1]. Patients who have not discussed the cosmetic procedure with a current mental health provider (if they see one) or who refuse to allow communication between the proceduralist and the mental health provider should be viewed with caution. If a mental health consultation is recommended, the patient's willingness (or lack thereof) to comply may itself be informative [18].

It is paramount to assess motivations and expectations in individuals seeking cosmetic procedures. Motivation can be categorized as internal or external. Internally motivated patients aim to improve their own self-esteem with the procedure, whereas externally motivated patients seek cosmetic procedures to alter other life factors such as employment or relationships. Individuals with internal motivations for pursuing a procedure have a higher likelihood of meeting their goals [30]. Expected changes after the procedure should be explored not only for physical appearance

but also for perceived improvements in psychological functioning or social benefits [18]. The initial consultation could be started with an open-ended question such as "Why are you interested in a cosmetic procedure at this time?" Individuals who are able to describe clearly what they dislike about their appearance, as well as express realistic motivations and expectations regarding the results of a cosmetic procedure, are less likely to have body dysmorphic disorder [26, 30].

The Diagnostic and Statistical Manual of Mental Disorders, recently updated to the fifth edition (DSM-5) describes four criteria for diagnosing body dysmorphic disorder: (1) a preoccupation with an imagined or barely perceptible flaw; (2) performance of repetitive behaviors or mental acts in response to the appearance concerns; (3) marked distress and social impairment caused by the preoccupation; and (4) the absence of another mental disorder that can better account for the preoccupation [31]. There is some subjectivity that enters the assessment of the extent of the flaw. A patient's history, personality, and culture may give a perceived defect a significance that may not be shared by the clinician, but that does not make it intrinsically pathological [32]. Most individuals requesting aesthetic procedures aim to enhance minor imperfections [18]. However, the majority of patients with body dysmorphic disorder will present with concerns about more than one body part, with 3–4 discrete complaints on average. The area of focus may fluctuate over the course of the condition, and cosmetic treatment to one area may result in a shift of preoccupation to another body part [26, 33]. Any area of the body may be the focus of undue attention, but the most common presenting complaints are about the face, nose, skin, and hair. Women with body dysmorphic disorder are more likely to raise concerns about waist/hip size and hair abnormalities, while concerns about small body habitus, genital size, and hair thinning are more typical in men [1]. Of note, previous studies have shown no relationship between severity of physical deformity and magnitude of psychological distress [7].

Functional impairment caused by the preoccupation may be objectively evaluated and, therefore, be a helpful indicator of the disorder. As such, candidates for cosmetic treatment should be asked directly how the perceived flaw affects day-to-day functioning [18]. The impairments may be secondary to time-consuming and ritualistic behaviors that people with body dysmorphic disorder adopt to examine, improve, or conceal their defects. These behaviors can include mirror gazing, compulsive grooming, obsessively comparing their bodies/faces to those of people around them, skin picking, excessive scratching, scouring with household chemicals, and even performing self-surgery [34]. Patients may disclose thinking about their defect for hours on end, or may unintentionally reveal the intensity of the preoccupation by bringing photos of celebrities or pictures of themselves with superimposed drawing or digital editing to reflect the desired changes [18]. Almost paradoxically, obsessive body checking may be accompanied by mirror avoidance and extreme camouflaging practices including excessive makeup, wigs, large hats, and body coverings [18, 29]. These intrusive habits can result in avoidance of daily activities, social isolation, difficulties at school or work, unemployment or inadequate education, and in extreme cases, remaining housebound [26].

Given the difficulty in detecting the disorder and the brevity of patient visits, it is helpful to take into account patient behavior from the first point of contact to the end of the visit. During patient interview, the physician may witness the compulsive behaviors described above. Actively seeking cosmetic treatment from multiple providers in different disciplines (e.g., dentistry, dermatology, plastic surgery), as well as dissatisfaction from previous interventions can be an indication of an underlying pathology [18]. The patient may repeatedly seek reassurance regarding the defect, or s/he may blame all of her/his life difficulties for that defect [26]. On the other hand, individuals seeking cosmetic treatments may present their best selves to the physician to maximize the likelihood of a procedure. It is the interactions with the office staff and the nurses that may be more revealing than the interview itself. Frequent cancellations, appointment changes, requests to be seen outside of office hours, and refusal to speak with anyone except the physician may all be indicators of a psychopathology that would preclude successful cosmetic intervention [18].

Interview

The standard for diagnosis of body dysmorphic disorder is ascertaining that DSM-5 criteria are met through psychiatric interview [31]. The Structured Clinical Interview for DSM-IV Disorders (SCID) has been the most commonly used tool for psychiatric diagnoses and is designed to be administered by a trained mental health professional [35, 36]. Both the research version and clinical trials version of SCID-5 are available and SCID-V training material are currently being developed. Other instruments used in the psychiatric setting to evaluate the severity of body dysmorphic disorder include the National Institute of Mental Health Obsessive Compulsive Scale modified for body dysmorphic disorder, the Clinical Global Impression Scale, and the Yale-Brown Obsessive Compulsive scale modified for body dysmorphic disorder (BDD-YBOCS) [35]. These psychiatric interview tools have been used in multiple studies attempting to identify body dysmorphic disorder in dermatology and cosmetic surgery patient populations [6, 8, 9, 11, 15, 37], and to validate other screening questionnaires for the disorder [36, 38–41]. The regular use of these instruments in a dermatology or aesthetic surgery practice is impractical as they are time-consuming and designed to be used and interpreted by a professional with formal psychometric training [35].

The Anxiety and Depression Association of America provides the following self-test for adults as a screening questionnaire for body dysmorphic disorder, which could be used as a structured, four-question screening intake in a clinical practice [42]:

1. Are you very concerned about the appearance of some part(s) of your body which you consider especially unattractive? If yes: Do these concerns preoccupy you? That is, do you think about them a lot and wish you could worry less?
2. How much time do you spend thinking about your defect(s) per day on average?

3. Is your main concern with how you look that you aren't thin enough or that you might become too fat?
4. What effect has your preoccupation with your appearance had on your life?
    a. Has your defect(s) often caused you a lot of distress, torment, or emotional pain?
    b. Has your defect(s) often significantly interfered with your social life?
    c. Has your defect(s) often significantly interfered with your school work, your job, or your ability to function in your role (e.g., as a homemaker)?
    d. Are there things you avoid because of your defect(s)?

Patients are likely to have body dysmorphic disorder if they give the following answers: "yes" to both parts of question 1, endorse more than 1 h per day for question 2, and "yes" to question 4. An answer of "yes" to question 3 may suggest a diagnosis of body dysmorphic disorder, but alternatively, an eating disorder should be considered [42]. In a very fast-paced clinical environment, asking question 1 alone and eliciting a "yes" to both parts could distinguish which patients require additional questioning. As body dysmorphic disorder is a hidden disorder in which patients go to great lengths to conceal their condition, physicians must ask specific questions or the condition is likely to be overlooked [43].

Self-Report Questionnaires

Screening patients by behavioral observation and interview alone may still leave the clinician uncertain. Multiple self-report questionnaires and scales have been developed within the fields of psychiatry, plastic surgery, and dermatology for use as screening tools in the clinical setting. These surveys are intended for use and interpretation by nonpsychiatric physicians and have been tested in cosmetic surgery and dermatology patient populations, though to date no single questionnaire has been universally accepted as the screening instrument of choice. The following sections describe these instruments and their application as screening measures for people seeking dermatologic and aesthetic treatments. At the time of writing of this chapter and book, these questionnaires have not been updated to include DSM-5 criterion that involves the recognition of repetitive behaviors (e.g., mirror checking, excessive grooming, skin picking, reassurance seeking) or mental acts (e.g., comparing his or her appearance with that of others) in response to the appearance concerns. While some of the below mentioned questionnaires do inherently include this criterion, some do not and will have to be adjusted with the inclusion of respective questions.

Body Dysmorphic Disorder Questionnaire (BDDQ)

Phillips et al. developed the Body Dysmorphic Disorder Questionnaire (BDDQ) as a short self-reported screening device for body dysmorphic disorder in a psychiatric setting [44]. The form consists of four question sets aimed at demonstrating fulfillment of the diagnostic criteria as indicated by DSM-IV. For a positive screening result, patients must answer "yes" to both parts of question 1 indicating a preoccupation with a perceived body defect, confirm thinking about the defect for over 1 h per day, and answer "yes" to any part of question 3 demonstrating that the preoccupation and/or perceived defect interferes with normal functioning (Fig. 11.1) [35]. In addition, there is a version for adolescents.

When compared to a structured psychiatric interview, the BDDQ exhibited 100 % sensitivity and 89 % specificity as a screening measure for body dysmorphic disorder in 66 psychiatric outpatients [45], and similarly demonstrated 100 % sensitivity and 93 % specificity in a psychiatric inpatient sample [36, 46]. The BDDQ has been validated in a community-based sample [36] and used to estimate prevalence of body dysmorphic disorder among college students [5, 40].

The BDDQ has been used in two studies of individuals seeking cosmetic rhinoplasty [35, 38, 47]. Veale et al. administered the BDDQ as a screening measure in conjunction with a self-report version of the BDD-YBOCS to assess symptom severity before and after rhinoplasty. Six of 29 patients had a positive screening result indicating "possible body dysmorphic disorder" pre-rhinoplasty, and had significantly higher scores on the self-report BDD-YBOCS than the patients with a negative screening result. However, at the 9th month post-rhinoplasty, no patient out of the 29 patients had a positive screening result on the BDDQ and the overall mean BDD-YBOCS scores were low, indicating mild symptom severity in the total patient group. Given the study findings, Veale et al. suggested that the BDDQ had identified false positives in their sample [38]. In the second study, the BDDQ was used to identify features of body dysmorphic disorder to correlate body dysmorphic disorder traits with self-esteem, personality, and quality of life [47]. Of note, neither studies compared the BDDQ to a gold standard, diagnostic measure (psychiatric interview) to validate the BDDQ as a screening tool for body dysmorphic disorder in a cosmetic patient population [35].

Body Dysmorphic Disorder Questionnaire—Dermatology Version (BDDQ-DV)

A modified version of the BDDQ, called the Body Dysmorphic Disorder Questionnaire—Dermatology Version (BDDQ-DV), was created by Dufresne et al. and Phillips et al. for the dermatology setting [13, 14]. Alterations included removal of questions 2 and 4 and the addition of five-point scale to response elements of question 3 (Fig. 11.2). Similar to the BDDQ, patients indicating preoccupation with an aspect of their appearance and at least moderate distress or disturbances in functioning screen positive for body dysmorphic disorder [13].

Please read each question carefully and circle the answer that is true for you. Also write in answers where indicated.

1) Are you worried about how you look? Yes No

--If yes: Do you think about your appearance problems a lot and wish you could think about them less? Yes No

--If yes: Please list the body areas you don't like:

_____

_____

Examples of disliked body areas include: your skin (for example, acne, scars, wrinkles, paleness, redness); hair; the shape or size of your nose, mouth, jaw, lips, stomach, hips, etc.; or defects of your hands, genitals, breasts, or any other body part.

NOTE: If you answered "No" to either of the above questions, you are finished with this questionnaire. Otherwise continue.

2) Is your main concern with how you look that you aren't think enough or that you might get too fat? Yes No

3) How has this problem with how you looked affected your life? Yes No

Has it often upset you a lot? Yes No

Has it often gotten in the way of doing things with friends, dating, your relationships with people, or your social activities? Yes No

--If yes: Describe how: _____

_____

Has it caused you any problems with school, work, or other activities? Yes No

--If yes: What are they?_____

_____

Are there things you avoid because of how you look? Yes No

--If yes: What are they? _____

_____

4) On an average day, how much time do you usually spend thinking about how you look? (Add up all the time you spend in total in a day, then circle one.)

(a) Less than 1 hour a day (b) 1-3 hours a day (c) More than 3 hours a day

Fig. 11.1 Body Dysmorphic Disorder Questionnaire (BDDQ) [44]. The Broken Mirror: Understanding and Treating Body Dysmorphic Disorder by Phillips (2005) Fig "BDDQ for Adolescents" p. 380. By permission of Oxford University Press, USA

Are you very concerned about the appearance of some part of your body, which you consider especially unattractive? **Y** **N**

If no, thank you for your time and attention. You are finished with this questionnaire.

If yes, do these concerns preoccupy you? That is, you think about them a lot and they're hard to stop thinking about? **Y** **N**

What are these concerns? What specifically bothers you about the appearance of these body parts?

_____

_____

_____

What effect has your preoccupation with your appearance had on your life?

_____

_____

Has your defect often caused you a lot of distress, torment, or pain? How much? (circle best answer)

1	2	3	4	5
No distress	Mild, and not too disturbing	Moderate and disturbing but still manageable	Severe, and very disturbing	Extreme and disabling

Has your defect caused you impairment in social, occupational or other important areas of functioning? (circle best answer)

1	2	3	4	5
No limitation	Mild interference but overall performance not impaired	Moderate, definite interference, but still manageable	Severe, causes substantial impairment	Extreme, incapacitating

Has your defect often significantly interfered with your social life? **Y** **N**

If yes, how?

_____

_____

Has your defect often significantly interfered with your school work, your job, or your ability to function in your role? **Y** **N**

Are there things you avoid because of your defects? **Y** **N**

_____

_____

Fig. 11.2 Body dysmorphic Disorder Questionnaire—Dermatology Version (BDDQ-DV) [14]

The BDDQ-DV was validated in a sample of 46 cosmetic dermatology patients as compared to the Body Dysmorphic Disorder-Diagnostic Module (BDD-DM), a semi-structured interview instrument based on DSM-IV criteria for body dysmorphic disorder. Nine (19.6%) of the 46 patients screened positive using the BDDQ-DV and 7 (15.2%) were diagnosed with body dysmorphic disorder by BDD-DM. This resulted in 100% sensitivity and 92% specificity with a positive predictive value of 70% and a negative predictive value of 100% [14]. Limitations included a small sample size and administration of the BDD-DM by a physician without formal psychometric training [35].

Three additional studies have used the BDDQ-DV to estimate the prevalence of body dysmorphic disorder in dermatology patients. Phillips et al. administered the BDDQ-DV to 268 patients presenting to a general dermatology community practice and a university-based dermatologic cosmetic surgery practice, and found a positive screening result in 11.9% of patients. This estimate was increased to 15.2% in individuals with nonexistent or minimal defects [13]. Bowe et al. used the BDDQ-DV as a screening tool in patients with acne vulgaris [16], and Conrado et al. used this instrument to evaluate 300 patients presenting to general and cosmetic dermatology practices [41]. These studies reported positive screening results in 14.1 and 9.1% respectively [16, 41]. None of the three studies used a psychiatric interview to confirm the diagnosis of body dysmorphic disorder [35].

Body Dysmorphic Disorder Examination—Self Report (BDDE-SR)

The Body Dysmorphic Disorder Examination (BDDE) is a 34 question semi-structured clinical interview devised as a diagnostic and symptom severity tool. It has been shown to be a valid and reliable instrument for diagnosing body dysmorphic disorder; however, its administration is very time-intensive [48]. The Body Dysmorphic Disorder Examination-Self Report (BDDE-SR) is a written, patient-completed version of the BDDE. The BDDE-SR asks patients to rank the five physical features that bother them the most and then answer several questions as they relate to the highest ranked feature. These questions evaluate diagnostic criteria and symptoms of body dysmorphic disorder, such as frequently checking the feature, seeking reassurance from others, emotional distress, avoiding public places, work, and social situations, and camouflaging [7, 48]. Each question is answered on a scale of 1–6, and all answers are summed to produce a total score. No set cutoff score is considered diagnostic, though higher scores are associated with greater severity of body dysmorphic disorder symptoms [48]. The BDDE-SR has been used as a screening tool in cosmetic surgery patients [7, 49]. It has also been used to measure body image dissatisfaction and body dysmorphic disorder symptoms in obese women [50], women undergoing breast reduction and breast augmentation surgery [51, 52], women seeking rhytidectomy and blepharoplasty [53], and women with eating disorders [54].

Sarwer et al. applied the BDDE-SR as a screening and diagnostic instrument in 100 female cosmetic surgery patients and reported a statistically significant higher BDDE-SR mean score in the cosmetic surgery patient population than in that of a normative age comparable sample (47.76 vs. 27.8 respectively, $p < 0.005$). Using the BDDE-SR, seven patients were diagnosed with body dysmorphic disorder [50]. In a smaller study, Pertschuk et al. administered the BDDE-SR to 30 men seeking cosmetic surgery and reported an average BDDE-SR score of 37.52, which was statistically significantly higher than an age-comparable sample of men [49]. Neither of the two studies used a psychiatric interview to confirm the diagnosis [35].

Body Dysmorphic Symptoms Scale (BDSS)

The Body Dysmorphic Symptoms Scale (BDSS) is a 10-item questionnaire developed at the Institute of Psychiatry at the University of Pisa [55]. Yes–No questions are directed at assessing key behaviors associated with body dysmorphic disorder such as frequent mirror-checking, camouflaging, and avoidance [56]. The Modified Pisa BDSS is a slightly different version of the BDSS in which question 6 has been altered to detect unrealistic expectations from an intervention (Fig. 11.3) [25, 57]. Scoring is calculated by summing the questions answered as "yes" for a maximum score of 10. Muhlbauer et al. proposed interpretation of the score as follows: positive response to questions 1 through 5 might by candidates for surgical/dermatologic intervention but further workup is needed, positive response to questions 1 through 7 indicates likely body dysmorphic disorder, and positive response to question 1 through 10 contraindicates an intervention [57]. A practical algorithm using the Modified Pisa BDSS is described in Fig. 11.4.

The BDSS has been used as a screening tool in a university-based dermatology practice. The questionnaire was completed by 107 dermatology patients with a variety of skin diseases as well as 109 age- and sex-matched university students. Mean BDSS score was statistically significantly higher in the skin disease group than in the control group. The authors chose a score of greater than 4 to signify increased risk for body dysmorphic disorder and found that a higher number of patients with skin disease (17.8 %) scored greater than 4 on the BDSS as compared to healthy controls (2.8 %) [56]. Diagnosis of body dysmorphic disorder was not confirmed by psychiatric evaluation in this study [35].

Dysmorphic Concern Questionnaire (DCQ)

The Dysmorphic Concern Questionnaire (DCQ) is a seven-question screening instrument developed Oosthuizen et al. (Fig. 11.5) [58]. Questions are directed towards assessing symptomology and overconcern with physical appearance rather than trying to establish a diagnosis of body dysmorphic disorder. Response to each

1. Are you seriously concerned that one part of your body is defective?

2. Do you look at yourself in the mirror carefully and repeatedly?

3. Do you avoid looking at yourself in the mirror to be less worried?

4. Are you concerned that others may be looking at, talking about, or making fun of your defect?

5. Do you try to hide or camouflage your defect with your hands, makeup, or clothing?

6. Do you expect your life to change radically after surgery?

7. Have you neglected your usual activities because of the defect?

8. Are you ever so enraged and in despair that you lose control and become insulting, aggressive, or violent toward your relatives and friends?

9. At these times, do you break any object or punch and kick walls and doors?

10. Are you ever so in despair that you wish yourself dead or want to harm yourself because of your despair?

Fig. 11.3 Modified Pisa Body Dysmorphic Symptoms Scale (BDSS) [25, 55, 57]

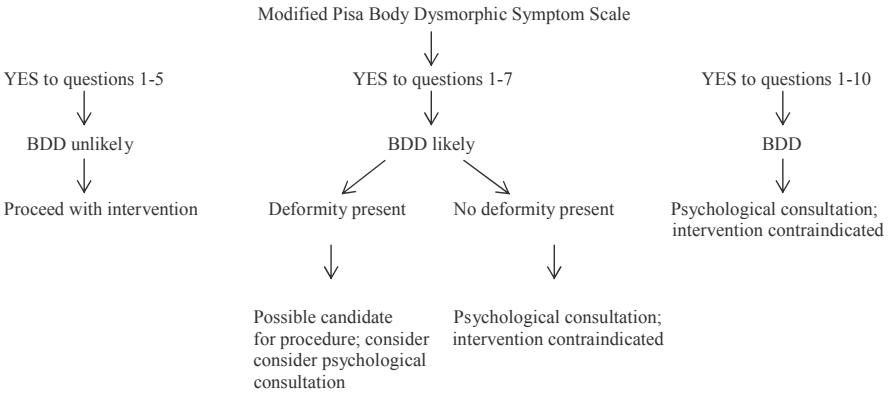

Fig. 11.4 Practical algorithm for use with Modified Pisa Body Dysmorphic Symptoms Scale (BDSS) as a screening questionnaire [25, 57]

Have you ever:

1. 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

2. 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

3. 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

4. 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

5. Been told by others/doctor 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

6. Spent a lot of time worrying about a defect in your appearance/bodily functioning

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

7. 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

Fig. 11.5 Dysmorphic Concern Questionnaire (DCQ) [58]

question is either "no concern (0)" or, as compared to most other people, graded as "the same (1)" "more (2)" or "much more (3)" and summed for a total score. In validation studies with psychiatric patients, the DCQ demonstrated good internal consistency, a unidimensional factor structure, and strong correlation with distress and work and social impairment [58, 59].

A study exploring the cutoff scores as a screening tool for body dysmorphic disorder showed a cutoff score of 9 provided the best balance of sensitivity and specificity [60]. Stangier et al. used the DCQ as a screening tool in 65 female dermatology patients as compared to the BDD-DM and BDD-YBOCS. The sample consisted of 22 patients with body dysmorphic disorder, 21 patients with mild dermatological disorders, and 22 patients with disfiguring dermatological conditions. A DCQ cutoff score of 11 captured 100 % of those with body dysmorphic disorder,

100 % of those with mild disorders, and 59 % of those with disfiguring conditions. A DCQ cutoff score of 14 optimized sensitivity and specificity by accurately classifying 72 % of those with body dysmorphic disorder and 90.7 % of those without body dysmorphic disorder [60, 61].

Cosmetic Procedure Screening Questionnaire (COPS)

Veale et al. developed the Cosmetic Procedure Screening Questionnaire (COPS) in 2012 with the goal of designing a brief-screening questionnaire for body dysmorphic disorder that would also be sensitive to change after an intervention. Two groups of individuals seeking a cosmetic procedure, a community group and a group of patients diagnosed with body dysmorphic disorder by psychiatric interview, were asked several questions regarding their appearance and distress or impaired functioning related to their physical feature(s). In question 1, the individual is asked to describe the feature(s) of his or her body which is disliked or the individual would like to improve. After this, the patient is asked to draw within a pie chart the estimated the percentage of concern allocated to each feature. This is followed by a series of nine questions that were included in the final version of the COPS questionnaire after showing a significant difference between the two groups and meeting criteria for effect size (see manuscript by Veale et al. for full questionnaire). Each question is rated on a scale of 0–8 with a maximum achievable score of 72. The authors recommend referring patients with an initial score of 40 or higher for further evaluation. The questionnaire demonstrated adequate internal consistency and test–retest reliability with a high sensitivity for detecting body dysmorphic disorder in patients seeking cosmetic procedures [39].

Body Image Concern Inventory (BICI)

The Body Image Concern Inventory (BICI) was developed by Littleton et al. as a 19-item questionnaire (possible score 19–95) for use in research and clinical settings as a measure of dysmorphic concern [62]. The survey has been validated in multiple studies with undergraduate students [62], an ethnically diverse Spanish-speaking community population [63] and an Italian community sample [64]. The BICI demonstrated 96 % sensitivity and 67 % specificity in distinguishing clinical disorders from subclinical symptoms in 40 undergraduate students diagnosed with body dysmorphic disorder and eating disorders [62]. The BICI was administered to 117 individuals seeking cosmetic rhinoplasty who were also interviewed by a psychiatrist to evaluate for a diagnosis of body dysmorphic disorder. It detected the disorder with 93.5 % sensitivity, 80.8 % specificity, 63.4 % positive predictive value, and 96.5 % negative predictive value at a cutoff score of 42 [65].

Conclusion

Although only three (BDDQ-DV, DCQ, BICI) of the current surveys have been authenticated by psychiatric evaluation when used in dermatology and plastic surgery settings, all report similar prevalence of body dysmorphic disorder in these patient populations. It appears there is relevance in each of these surveys depending on the practice milieu. In addition, it is important not to neglect the significance of the face-to-face interaction between the proceduralist, the staff, and the patient. There are limitations to the use of these questionnaires, and, as indicated above, many to date have not yet been updated to include DSM-5 criterion pertaining to the recognition of repetitive behaviors or mental acts in response to appearance concerns. One recent study used an additional question incorporating the new criterion in a population telephone survey to compare the prevalence of BDD using DSM-IV vs. DSM-5 criteria. In this study, BDD diagnosis was not authenticated by psychiatric interview, and it was not used as a screening tool for patients seeking cosmetic procedures; however, it did show that the revised criteria did not seem to have an impact on prevalence rates [66]. From this very limited data, for the time being, it appears that current questionnaires can still be adequately used to diagnose BDD. As there are no fully up-to-date questionnaires and no universal consensus on the most appropriate questionnaire, more research is needed in this area for efficient diagnosis of BDD in those who present to the dermatology, cosmetic, and plastic surgery clinics.

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Chapter 12
Therapeutic Interventions for Body Dysmorphic Disorder

Rachel McAndrew, Eric Sorenson and John Koo

Introduction

Patients with body dysmorphic disorder (BDD) often seek nonpsychiatric treatment. Many will attempt to receive cosmetic treatments for appearance enhancement, the most common being dermatologic and surgical [1]. If unable to find a cosmetic surgeon to perform the treatment, some may become so desperate that they perform surgery on themselves [2]. BDD responds poorly to such treatments and can even become worse. The expeditious recognition of BDD and commencement of treatment can have a positive impact on BDD patients' lives [3]. With adequate treatment, patients may experience full or substantial remission of symptoms and have an improved quality of life [4]. The most effective and validated treatment options will be discussed in this chapter, including psychotherapeutic and pharmacologic interventions.

Psychological and pharmacological treatments for BDD both have significant utility [5]. No head-to-head studies exist comparing the efficacy of psychotherapy and pharmacotherapy directly. A meta-analysis suggests that psychotherapy may be the more impactful of the two [5]; however, the effect of psychotherapy may be overestimated in the literature due to lack of blinding in control groups. The utilization of both treatment options in conjunction may have synergistic effects. Medication can make it easier for patients to realize the positive effects of psychotherapy and should certainly be considered in patients with severe cases of BDD [6].

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When evaluating BDD patients for treatment, it is important to evaluate for psychiatric comorbidities. There is overlap in the symptoms, response to treatments, and even a genetic link between obsessive–compulsive disorder (OCD) and BDD. Anxiety, major depressive disorder, and social phobias are very commonly comorbid with BDD as well [7]. Furthermore, BDD patients may or may not be delusional (36 % of BDD patients were delusional in one study) [6]. The consideration of comorbidities, classification, and severity should be incorporated in the decision-making process when making a treatment regimen for BDD.

There are many barriers to overcome when treating BDD, and successful treatment will be contingent upon the acceptance, cooperation, and motivation of the patient. While some patients may feel relieved with the diagnosis of BDD, most BDD patients will be reluctant to accept their diagnosis. In addition, mental illness can, unfortunately, be stigmatized, which may make some reluctant to seek treatment. The clinician should not attempt to convince the patient that his or her beliefs are incorrect but should also avoid validating them. It is important to establish an alliance with the patient, to be empathic for the patient's suffering, and to focus on discussing the potential for improvement with proper psychotherapeutic and/or pharmacologic treatment.

Psychotherapeutic Treatment

Cognitive behavioral therapy (CBT) that specifically focuses on BDD symptoms is the first-line of psychotherapeutic treatment for BDD [8]. Both individual and group sessions of CBT are effective in treating BDD [9, 10]. CBT has also been shown to be safe and effective in children and adolescents [11]. The use of inference-based therapy (IBT), where the therapy revolves around the patient's misguided inferences about their body image, may be a beneficial therapeutic approach as well [12]. There is very limited evidence evaluating other forms of psychotherapy for the treatment of BDD [8].

Therapeutic techniques for BDD are developed around the understanding of thought processes prevalent in BDD. For patients with BDD, appearance is believed to be highly important, and individuals tend to see themselves as unattractive [13]. Patients with BDD are thought to have enhanced aesthetic sensitivity [14]. Compared to a control group, functional magnetic resonance imaging (fMRI) studies revealed that BDD patients are much more focused on recognizing facial details than on processing facial information holistically [15]. Individuals with BDD tend to have high levels of perfectionism and compare themselves extensively with others. Perceived teasing may also have a significant role in BDD [16]. Maladaptive appearance-related behaviors, values, and beliefs perpetuate the disorder [13].

CBT entails using cognitive and behavioral therapeutic strategies in conjunction over the course of treatment. In the treatment of BDD, cognitive methods have focused on recognizing maladaptive thoughts, helping the patient realize overvalued beliefs about physical appearance, and instituting cognitive restructuring regarding

body dissatisfaction. Behavioral components of therapy for BDD have entailed methods such as exposure therapy, response prevention, and relapse prevention [10]. These methods are detailed below.

Cognitive Behavioral Therapy

CBT is a practical treatment approach that teaches skills and includes cognitive restructuring, behavioral experiments, exposure, and response prevention. It focuses on changing and substituting, both, beliefs and thoughts (cognitive aspect) and behaviors (behavioral aspect) such as skin picking and mirror checking. CBT should be tailored to the individual person and performed by a trained therapist who is familiar in treating BDD. It is typically administered as weekly, hourly sessions. Wilhelm et al. developed a treatment manual for CBT for BDD. The CBT-BDD methods include the following facets as outlined below [17]:

- Psychoeducation and cognitive-behavioral case formulation begins the process of CBT-BDD by educating the patient about BDD and developing a cognitive-behavioral model for the patient's specific symptoms.
- Cognitive restructuring entails evaluating maladaptive thoughts with Socratic questioning and identifying cognitive errors with the goal of developing more accurate and helpful beliefs.
- Exposure identification provides insight on situations that provoke anxiety. Patients should gradually practice confronting these situations with the goal of eventually no longer needing to avoid these stressors.
- Ritual prevention identifies situations in which rituals are performed and strategies are developed to reform them to stop compulsive behaviors.
- Mindfulness/perceptual retraining helps the patient's mind focus on the body as a whole. Patients use objective, nonjudgmental language to describe the *entire* body in the mirror with avoidance of excessively focusing on details.
- Advanced cognitive strategies identify and challenge deeply rooted negative beliefs to broaden the basis for self-worth.
- Relapse prevention strategies may entail scheduling healthy activities to replace and distract from time spent on compulsive BDD-related repetitive behaviors.
- Targeted modular interventions may focus on specific patients needs such as: (1) skin picking and hair plucking, (2) muscularity and weight, (3) cosmetic treatments, and (4) mood management.

A randomized waitlist-control study evaluated the efficacy of CBT-BDD [18]. Efficacy was evaluated using the body dysmorphic disorder-Yale Brown Obsessive Compulsive Scale (BDD-YBOCS), the most frequently used scale for BDD treatment response. Responders were defined as having greater than 30 % improvement at the end of the treatment period. After 12 weeks of weekly 60-min sessions, 50 % (8 of 16) of participants in the treatment group were BDD-YBOCS responders compared to 12 % (2 of 17) in the waitlist control group ($p = 0.026$). After 12 weeks, all study participants were crossed over into the treatment group, and by the end of the

22-week study, 81 % (26 of 32) of all participants were responders. Patient satisfaction in this study also was high (client satisfaction inventory with score of 87.3 %), and treatment gains were maintained when evaluated at a 6-month follow-up.

Traditional CBT methods (not according to the BDD-CBT protocol) have also been efficacious in the treatment of BDD in a number of controlled trials and case series. A randomized waitlist-controlled study evaluated the efficacy of 12 weeks of CBT in BDD patients. They found that the treatment group had a mean 50 % reduction in symptoms on the BDD-YBOCS with a significant difference compared to the control group (treatment group 22.00 pre-, 10.75 posttreatment; waitlist group 21.18 pre-, 24.33 posttreatment, $p < 0.01$) [9]. A higher score corresponds to more severe symptoms on the BDD-YBOCS. Evidence has repeatedly supported the efficacy of individual CBT in the treatment of BDD, and it is considered as the first-line psychotherapeutic technique. In fact, CBT was found to be the best-established treatment for a variety of somatoform disorders, including BDD, in a review of 34 randomized controlled trials involving 3922 patients [19].

Group CBT has also been studied and found to be useful in the treatment of BDD. One randomized waitlist-controlled study ($n = 54$) demonstrated significantly improved scores on the body dysmorphic disorder examination (BDDE) (treatment group 93.9 pre-, 41.4 posttreatment; waitlist group 89.9 pre-, 83.2 posttreatment, $p < 0.001$) [10]. A higher score corresponded to more severe symptoms. Not only was the treatment effective, but also the patients reported a positive impression of the therapy. During the weekly 2-h sessions of 8 weeks, attendance was 100 %, and 80 % of the participants said they would recommend the program. Another case series demonstrated the efficacy of group CBT (BDD-YBOCS pretreatment 28.5, posttreatment 21.3); however, this study lacked a control group [20]. The demonstrated efficacy of group CBT may have the added benefits of increased social support and decreased cost. Direct comparisons of efficacy and compliance between individual and group CBT for BDD are needed.

BDD is commonly seen in adolescents, but the treatment in this population has not been well studied. From the limited data available, CBT has been successful in the pediatric population. One case series found that 4 of 6 patients were responders by the BDD-YBOCS, and that all of these patients also experienced a concomitant decrease in depressive symptoms [11]. CBT has been demonstrated to be effective in adults and data suggest this is true in pediatrics as well; however, more studies in this population are warranted. When working with a younger population, it is important to adjust the technique by using appropriate language and interaction approach for the age group. Emphasizing behavioral strategies over cognitive strategies may be beneficial for younger patients as well [11].

Inference-Based Therapy

Inference-based therapy (IBT) is a technique that was originally developed for patients with OCD with particularly fixed beliefs or obsessions. BDD shares features with OCD including obsessions, fixed ideations, and repetitive behaviors. Many

BDD patients have *overvalued ideation* (*OVI*), which is a very strong conviction in the objective reality of their belief without the level of certainty to qualify as a delusion. Patients with OVI may be less likely to respond to CBT [21].

In IBT, BDD obsessions are conceptualized as a two-step process where the establishment of a faulty inference is used as the basis for a secondary inference with negative anticipated consequences. For example, the belief that "I am not big enough to get noticed" (faulty inference) may be followed by the inference "if I never get noticed, I will never find a girlfriend" (negative consequence). In this case, the patient was 90 % convinced that if he did not perform his rituals (working out), he would suffer the negative consequence (never getting a girlfriend) [12]. In IBT, the therapist first tries to explore the patient's fear or believed negative consequence and then works backward to help identify the initially held obsessional belief [12]. These faulty inferences are the primary target for therapeutic intervention with IBT. One case series demonstrated the efficacy of IBT for patients with BDD [12]. IBT may be especially useful in patients with firmly held ideations contributing to their BDD. More studies are needed on the emerging topic of IBT for BDD.

Pharmacologic Treatment

Selective-serotonin reuptake inhibitors (SSRIs) are the first-line agents in the pharmacologic treatment of BDD [22, 23]. These are antidepressants that have also been shown to have efficacy in diminishing OCD-type symptoms. By inhibiting the reuptake of serotonin, SSRIs increase the availability of this neurotransmitter at cell–cell junctions. While there are currently no medications approved by the FDA for the treatment of BDD, SSRIs are the most studied and efficacious medications in the treatment of BDD. SSRIs have been shown to be more effective in treating BDD compared to non-SSRI medications [24, 25]. They also appear to help people with delusional BDD as much as those with non-delusional BDD [2]. Modification of SSRI treatment by adding a non-SSRI psychotropic medication can be beneficial in recalcitrant cases. Some non-SSRI medications may be effective in the treatment of BDD as monotherapy as well.

Selective-Serotonin Reuptake Inhibitors (SSRIs)

SSRIs are useful for the medical management of many psychiatric conditions including: major depressive disorder, OCD, generalized anxiety disorder, panic disorder, phobias, bulimia, posttraumatic stress disorder, and a number of off-label uses, including BDD. They are generally well tolerated, but common mild–moderate side effects include: gastrointestinal disturbances, agitation, anxiety, insomnia, and sexual dysfunction. SSRI medications currently available include: fluvoxamine (Luvox®) 50–300 mg/day, fluoxetine (Prozac®) 20–80 mg/day, paroxetine (Paxil®) 20–50 mg/day, sertraline (Zoloft®) 50–200 mg/day, citalopram (Celexa®)

20–40 mg/day, and escitalopram (Lexapro®) 10–20 mg/day. Clomipramine (Anafranil®) 150–250 mg/day is a nonselective serotonin reuptake inhibitor (SRI) that has also been used as treatment for BDD. Clomipramine is generally not used first-line as it is more likely to cause side effects and can be toxic at very high doses.

Randomized controlled studies and open-label studies have been conducted on fluoxetine, fluvoxamine, citalopram, and escitalopram, all demonstrating clinically significant improvements in symptoms. In a randomized placebo-controlled trial, fluoxetine was shown to be effective in 53 % of patients compared to 18 % in the placebo group. The mean response time was 7.7 weeks in these patients, and the mean dose was 77.7 mg/day [26]. The relative response to fluoxetine compared to the placebo group was 3.07 [23]. Two open-label studies demonstrated the efficacy of fluvoxamine in the treatment of BDD [27, 28]. In one study, 10 of 12 patients were markedly improved after 10 weeks of fluvoxamine therapy [27]. In the other study, 63.3 % ($n=30$) of patients responded to fluvoxamine based on the BDD-YBOCS with a mean response time of 6.1 weeks and a mean dose of 238 mg/day [28]. An open-label study evaluated the efficacy of citalopram for the treatment of BDD and found that 73.3 % (11 of 15 patients) were responders after 12 weeks [29]. The mean endpoint dose for citalopram was 51.3 mg/day and mean time to response was 4.6 weeks. An open-label study of escitalopram demonstrated an efficacy of 73.3 % (11 of 15 patients) with a mean endpoint dose of 28.0 mg/day (starting at 10 mg/day, increasing dose by 10 mg every 2 weeks up to 30 mg/day) and a mean time to response of 4.7 weeks [30]. Although no studies have compared one SSRI to another, one author has noted that escitalopram and citalopram had somewhat higher percentages of patient improvement, had higher percentages of "very much improved" compared to only "much improved," and lastly, many patients in those studies responded earlier (within 2–6 weeks) [2]. More research is needed; however, it may be that escitalopram and citalopram are most efficacious.

SSRIs have been used in the treatment of adolescents with BDD as well. Fewer and less rigorous studies support this, but the literature is promising. In a case series of 33 children and adolescents with BDD, 53 % (10 of 19) of patients treated with an SSRI had a substantial improvement in their BDD symptoms [31]. In addition, 7 case reports of the treatment of BDD in adolescents with SSRIs demonstrate overall marked improvement [31–34]. Similarly to adults, high doses were needed to see an improvement in symptoms in many cases. The medications were well tolerated in the cases reported, even at high doses.

There are no studies directly comparing SSRI doses in the treatment of BDD. In order to elicit the desired response in the treatment of BDD, it is typical to require higher doses of SSRIs compared with their use for other indications. Doses needed to improve symptoms are typically at the high end of dosing ranges and, sometimes, even exceed these ranges. Clinicians should start patients on a low dose and titrate up to the maximum dose recommended by the package insert, as tolerated. Titration should be performed gradually over the first 1–2 months. On average, response occurs after several weeks of treatment.

Achieving the optimal therapeutic doses and duration for effective pharmacologic treatment occurs less frequently in actual practice than is described in the literature. Phillips et al. describe a "minimally adequate" trial with an SSRI that entails daily oral medication for 10 weeks at the following daily doses: fluvoxamine 150 mg, fluoxetine 40 mg, paroxetine 40 mg, sertraline 150 mg, citalopram 40 mg, or escitalopram 20 mg. Criteria for an "optimal" trial with SSRIs include using or exceeding the maximum dose recommended by the manufacturer for at least 12 weeks duration [35]. Their retrospective review demonstrated that 34.4 % of medications were not optimally prescribed [35]. This study points to an important obstacle in treatment; many clinicians may not be aware of or comfortable with the doses and duration necessary to achieve an optimal response. Similarly, many patients may be impatient while waiting several weeks for their treatment to become effective, which likely compromises compliance. Increased education of clinicians and proper counseling of patients regarding the duration of treatment with an SSRI and common side effects may improve response rates and compliance.

SSRIs are generally relatively safe and well tolerated. Side effects reported in the above studies were infrequent and mild–moderate in nature. They are more likely to occur early in treatment and/or when the dose is raised. They may improve or disappear on their own with time. In addition, a slower up titration or lowering the dose can give the body time to adjust and diminish side effects. The most frequently reported side effects include: fatigue, nausea, and sexual dysfunction. Others include insomnia, decreased appetite, jittery sensations, and sweating. These will resolve upon discontinuation of the medication and none cause life-threatening side effects. Although there are some concerns about whether the use of SSRIs increases suicidality, the evidence in adults is inconsistent and no clear correlation can be drawn [36]. A randomized controlled study in pediatric patients found an increased risk of suicidal ideation but not in attempted or completed acts of suicide [37]. A medication history should be obtained prior to SSRI initiation. For example, MAO inhibitors are antidepressants that should never be given with SSRIs.

Due to the efficacy and relative safety of SSRIs, long-term continuation of therapy is recommended. Patients will likely see further improvement in their symptoms with the continuation of SSRI therapy. Patients desiring to discontinue from a successful SSRI therapy regimen should be cautioned about the potential for relapse. As always for SSRI medications, discontinuation should never be done abruptly but rather as a slow taper. Severely ill and previously suicidal patients may require lifelong SSRI treatment. About 85 % of people who stop an effective SSRI will have a return of symptoms; however, for some, they may not be as severe [2].

If a particular SSRI is not working, the physician can try switching to another SSRI or adding another medication. No head-to-head trials of SSRIs are available and all appear to, on average, work equally well. If one SSRI appears ineffective after an appropriate trial at the highest recommended or tolerated dose for at least 3–4 months, another SSRI may still be effective. Adding a medication may be the appropriate approach if the SSRI is partially effective.

Adjunct and Monotherapy

Other psychotropic medications may be used in the treatment of BDD as an adjunct to SSRI treatment or as monotherapy. Side effects are more common among many of the other psychotropic medications compared to SSRIs, and their efficacy data has not consistently demonstrated the magnitude of response seen with SSRIs. However, while SSRI medications should be first-line pharmacologic treatment for BDD, the use of other psychotropic medications as an adjunct or as monotherapy is worthy of consideration in recalcitrant cases.

Adjunct therapy to an SSRI with other psychotropic medication may be very effective, especially in difficult to treat cases. Medications used to augment SSRIs include clomipramine, busiprone, levetiracetam, venlafaxine, bupropion, olanzapine, ziprasidone, risperidone, lithium, and methylphenidate to name a few [2]. The temporary use of benzodiazepines during the first few weeks of treatment may be helpful for those unable to sleep or severely anxious. A chart review evaluated SSRI monotherapy and SSRI therapy augmented with another psychotropic medication for patients who had failed SSRI monotherapy. They found that 63.2 % of patients responded adequately to SSRI monotherapy, and that augmentation therapy response rates were: 44.4 % for clomipramine (Anafranil®), 33.3 % for buspirone (BuSpar®), and less than 20 % for lithium, methylphenidate (Ritalin®), and antipsychotics [38]. In a case series, 6 of 13 (45 %) patients who had failed SSRI monotherapy improved after augmentation with buspirone [25]. One report in a patient with prominently delusional BDD demonstrated the success of using the antipsychotic risperidone (Risperdal®) in conjunction with the serotonin-norepinephrine reuptake inhibitor (SNRI) venlafaxine (Effexor®). The patient noticed marked improvement of symptoms after approximately a month and was symptom-free 6 months later [39]. In a randomized double-blind placebo controlled trial ($n=28$), another antipsychotic, pimozide (Orap®), did not appear to be any more efficacious than placebo as an adjunct to an SSRI (response rates: 18.2 % pimozide, 17.6 % placebo; $p=0.97$) [40]. Second generation neuroleptics, such as ziprasidone, olanzapine, and risperidone, may be particular helpful in those with delusional thinking and more efficacious than first generation neuroleptics such as pimozide. Certainly, more controlled studies evaluating adjunct therapy to SSRIs are needed to create a more evidence-based approach to BDD adjunct pharmacotherapy.

Other psychotropic medications have demonstrated efficacy in the treatment of BDD as monotherapy. The SNRI, venlafaxine, was evaluated in an open-label study ($n=17$) and resulted in a significant reduction in overall BDD symptoms from baseline ($p=0.012$), including both obsessions ($p=0.034$) and compulsions ($p=0.021$) according to the BDD-YBOCS [41]. A double-blind randomized crossover control study ($n=29$) evaluated the efficacy of tricyclic antidepressants (TCAs), which also have effects inhibiting the reuptake of serotonin and norepinephrine, in treating BDD. Improvement based on a 25 % increase on BDD-YBOCS was seen in 65 % of patients on clomipramine (a psychotropic medications with qualities of both TCAs

and SRIs) compared to 35 % on desipramine (a standard TCA that mainly blocks norepinephrine reuptake) ($p = 0.09$) [42]. However, TCAs are commonly associated with side effects and patients experienced high rates of anticholinergic symptoms (e.g., dry mouth, sedation, constipation) in the trial. Combining clomipramine and venlafaxine should be done with extreme care given the risk of serotonin syndrome.

Practical Approach Considerations for the Dermatologist or Cosmetic Surgeon [43]

- Recognizing and diagnosing BDD is the first step to proper treatment.
- Educate your patient.
  - Education is a crucial component for the treatment of BDD.
  - Explain to the patient that s/he does not have a significant dermatologic or surgical problem but rather a body image problem known as body dysmorphic disorder, characterized by being overly concerned about and affected by one's appearance.
  - Explain to your patient that BDD is treatable but that changing the actual body part of concern is unlikely to help.
  - Recommend appropriate reading material on BDD.
  - Educate family members, friends, and significant others.
- Empathize with your patient.
  - Patients tend to believe that their view of their appearance is correct and realistic.
  - Telling your patient that his/her beliefs are irrational or imagined or that their appearance is normal is unlikely to be accepted by the patient.
  - Focus on the distress that the impairment causes rather than on the physical appearance. This is more likely to facilitate a referral to a mental health professional.
  - Skin pickers may require a combination of psychiatric and dermatologic treatment.
- Avoid any dermatologic treatment and cosmetic procedures or interventions.
  - These treatments are not likely to be helpful and may make the condition worse.
  - Explain to the patient that you think s/he will not likely be happy with the cosmetic treatment but that there are successful treatments available to improve the distress experienced over his/her appearance.
  - The exception is for those who compulsively pick their skin that results in secondary manifestations such as infection.

- Refer the patient to a mental health professional.
  - Focus on discussing the potential to decrease symptoms and to improve daily functioning.
  - Refer to a therapist who is familiar with BDD for patients interested in CBT treatment.
  - Refer to a psychiatrist if the patient is interested in medication. Medical management is likely to be necessary if the patient is depressed or suicidal.
  - For patients resisting the psychiatric component to their problem, rather than discussing their physical appearance, try to focus on the large amount of time they spend obsessing or the amount of distress that it is causing them.
- Familiarize yourself with commonly used SSRIs.
  - For low-risk patients who refuse referral, familiarize yourself with commonly used SSRIs and consider treating the patient with medical management yourself or refer to the patient's general practitioner for this purpose.
  - Effective trials of SSRIs entail 12–16 weeks at the highest recommended dose as indicated by the manufacturer or highest dose that is tolerated by the patient. If that fails, consider a trial with another SSRI or combination therapy with a non-SSRI.

Conclusion

While dermatologists and cosmetic surgeons are likely to encounter BDD patients in consultations for cosmetic treatment, such treatments are inappropriate for patients with BDD and are not likely to yield satisfactory results. Changes in diet and natural remedies are also ineffective treatments for BDD. Some advocate certain foods, such as chicken avocado, corn, and bananas, as they may affect serotonin levels and natural remedies, such as St. John's wort and tryptophan, for BDD treatment [2]. These are not effective treatments.

BDD is best treated with SSRIs, CBT, or a combination of the two. Unfortunately, one study found that only 15 % of dermatologists surveyed thought that they could successively treat BDD [44]. While 72 % of dermatologists never prescribe antidepressants, 68 % never prescribe antipsychotics, and only 11 and 3 % were comfortable starting these medications, respectively [44]. We hope that an increase in awareness of the utility of these medications will improve the comfort level with prescribing them.

No studies directly compare SSRIs, CBT, and combination therapy head-to-head for BDD. They may be equally effective overall, but one may work better than the other for a particular person. A multidisciplinary approach may be very useful. When deciding on a treatment, motivation is an important consideration. CBT requires effort, motivation, and, most importantly, patient participation. For this reason, BDD treatment should be tailored to the individual.

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Chapter 13
Prognosis and the Effect of Body Dysmorphic Disorder on Life

Jonathan S. Thiele and Gareen Hamalian

Introduction

The best measure of the validity of prognostic indicators is replicability over large and varied populations over extended periods of time in well-controlled studies. Since body dysmorphic disorder (BDD) is not one of the more common mental illnesses, only a few prospective and retrospective studies have examined the course of the illness [1–7]. The prospective studies, which took place within the past decade, provide a better sense of what to expect after the diagnosis of BDD [3–6]. Though prognostic data on BDD is limited relative to other mental illnesses, what is available is largely consistent in a few important respects:

1. Most individuals with BDD will never seek or receive appropriate mental health treatment [2, 3].
2. The prognosis without mental health treatment is poor, with a chronic course and a surprisingly high rate of suicide and violence [1–6, 8–11].
3. Symptom severity and chronicity significantly worsen the prognosis of BDD [4].
4. Available mental health treatments substantially improve the prognosis, while cosmetic procedures rarely do [2, 12–18].

Only a minority of patients with BDD, 15.1 %, report their difficulties with body image or seek professional help, largely due to lack of insight, embarrassment,

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or concern about provider understanding [1, 19]. Furthermore, many with BDD refuse appropriate mental health treatment or terminate therapy prematurely [1]. Thus, most patients will unfortunately fall into what is likely the worst prognostic category of suffering from the illness without mental health treatment. The likelihood of ongoing distress, severe enough to lead frequently to suicidal thoughts and attempts, should prompt healthcare providers to be vigilant about the signs and symptoms of BDD, especially those who have the maximum contact with these patients: dermatologists, plastic surgeons, and mental health providers [2, 3]. Guidance toward appropriate treatment may prevent a lifetime of suffering, overuse of medical procedures, and premature death.

Chronic Course of Illness

According to the two largest prospective studies regarding BDD, unlike some mental illnesses that frequently remit with treatment, most BDD patients are unlikely to ever fully recover [3, 4]. These studies also demonstrate that BDD has a much lower probability of full remission at 4 years than more common mental illnesses such as major depressive disorder, [4, 20] generalized anxiety disorder, panic disorder, [4, 21] and mania [4, 22]. However, patients thought to have less severe symptoms and those receiving optimal treatment at a specialty center obtained a full recovery at a greater than 50 % rate [4, 5, 7].

Dr. Katherine A. Phillips of the Body Dysmorphic Disorder Program affiliated with Brown University led the two largest prospective studies mentioned above, which generated the most robust data on remission rates [3, 4]. The first study followed 183 subjects with BDD over a year and found that only 9 % obtained full remission and 21 % partial remission by the end of the study [3]. Fifteen percent of those who achieved full or partial remission relapsed [3]. The second study followed 166 subjects over 4 years, with an average duration of BDD symptoms of greater than 16 years at the start of the study [4]. At 2 years, 14 % of subjects obtained full remission and an additional 30 % obtained partial remission; by 4 years, only 20 % of subjects obtained full remission, and an additional 35 % obtained partial remission [4]. Of the subjects who obtained a full or partial remission by 4 years, 63 % experienced a full or partial relapse during the 4 years of the study [4]. This data does not generate much optimism for those working with BDD patients—even those who remit are more likely than not to relapse.

Despite these numbers, there is a reason to be hopeful. In these two studies, 12–15 % of the subjects did not receive any mental health treatment, and less than half of the patients in both studies received what is recommended in the BDD treatment guidelines [3, 4]. The studies did not compare remission rates between those who received the recommended treatment and those who did not, but it is safe to conjecture that patients are much more likely to remit on evidence-based treatments. One retrospective chart review, which included only patients who received treatment focused on BDD in a specialty clinic, found that 58 % achieved full remission

and an additional 26% achieved partial remission at some point during 4 years of follow-up [4, 7]. A much smaller prospective study, which included patients presumed to have less severe BDD, found even higher remission rates: 76% achieved a full recovery during an 8-year-period, with only 14% of patients who remitted experiencing a relapse [5].

Synthesizing these data, including weighing the larger prospective studies more heavily, still leads to the conclusion that BDD is typically much more chronic than other common mental illnesses (a 4-year full remission probability of 0.20 for BDD as opposed to 0.34 for generalized anxiety disorder, 0.57 for major depressive disorder, 0.66 for panic disorder, and 1.0 for mania) [4, 20–22]. In fact, BDD may even have a lower remission rate at 4 years than personality disorders, which are often considered to have a lifelong, enduring pattern [4, 23].

Compelling theories exist that may explain the high chronicity of BDD. Many clinicians, including mental health providers, are less familiar with the disorder and are less likely to make the correct diagnosis as compared to more common mental illnesses (in 5 studies, none of the 83 adult patients who screened positive for BDD had the diagnosis listed in the their medical records [1, 24–28]). Patients themselves are also less likely to present to a provider for assessment and are more difficult to engage in treatment due to embarrassment and lack of insight regarding their perceptions of oneself being inaccurate or distorted [1, 8, 19]. As such, they instead often seek dermatological and surgical treatments [2], highlighting the importance of providers' awareness of and familiarity with the disorder. Furthermore, the longer patients go undiagnosed and untreated, the worse their prognosis [1–3]. When those with BDD are finally engaged in treatment, they may require more intensive treatment than those with other difficult-to-treat mental illnesses such as obsessive-compulsive disorder (OCD) [8]. BDD patients are not screened and identified in an acceptable time frame, and therefore, fail to receive the appropriate attention and treatment they require to alleviate symptoms and unnecessary suffering.

Prognostic Indicators

The 4-year prospective study on BDD, arguably the best available data on prognosis, examined 15 indicators for their value in predicting a worse prognosis [4]. These three indicators, which were consistent with the other studies mentioned above, predicted a worse prognosis with a p value less than 0.05:

1. More severe BDD symptoms at time of intake [4]
2. Longer duration of BDD [4]
3. Younger age (under 18 years of age) [4]

Greater severity of BDD symptoms is correlated with higher rates of attempted suicide [2]. Similar to other mental illnesses, earlier age of onset (before the age of 18) is associated with a number of poor outcomes, including attempted suicide, a history

of physical violence against others, and more severe symptoms [29]. Surprisingly, subjects with less insight did not demonstrate a worse prognosis [4]. Other indicators were close to statistical significance, including having a comorbid personality disorder, major depressive disorder, substance use disorder, or social phobia [4]. Comorbid personality disorder diagnoses were found to significantly predict greater BDD chronicity, [1, 30] and another study found that improvement in symptoms of comorbid major depressive disorder predicted remission of BDD [8, 31]. Indicators of relapse for those who achieved full or partial recovery in the 4-year prospective study, which were statistically significant, were more severe symptoms at time of intake and earlier age of symptom onset [4]. Intake symptom severity and low or absent insight into the irrationality of body preoccupations were associated with worse psychosocial functioning [1, 32].

Similar to the above mentioned finding that age younger than 18 years predicts a worse prognosis, one study that compared adolescents and adults wherein both had BDD found that adolescents were more than twice as likely to have a substance use disorder, nearly twice as likely to have attempted suicide, and more likely to have a lower level of insight [1, 33]. One retrospective study identified a number of factors significantly associated with suicide attempts, which may reasonably be inferred as prognostic indicators for increased risk for suicide: delusional beliefs about one's appearance, a history of functional impairment due to BDD, current functional impairment, a history of bipolar disorder, posttraumatic stress disorder, an eating disorder, a substance use disorder, comorbid borderline personality disorder, or any other personality disorder [9]. In the same study, a history of major depression was significantly associated with a history of suicidal ideation but not suicide attempts [9]. Another study of inpatients with both BDD and anorexia nervosa found an alarmingly high rate of lifetime attempted suicide of 63 %, [9, 34], and those with posttraumatic stress disorder (PTSD) were six times more likely to attempt suicide than those without PTSD [9].

BDD symptoms improve with specific treatments. Selective serotonin reuptake inhibitors (SSRIs) decrease the severity and frequency of preoccupation with appearance and the time spent on related behaviors, as well as increase insight into BDD, overall functioning, and quality of life [1, 13, 14]. Of the patients with BDD who responded to fluoxetine or fluvoxamine, 60% felt their physical flaws had improved [2]. Cognitive-behavioral therapy (CBT) can decrease the severity of BDD symptoms [1, 15], and a study of exposure and response prevention therapy demonstrated maintenance of improvement even after 2 years [1, 16].

Larger studies with greater power can identify more statistically significant prognostic indicators. Engagement in appropriate mental health treatment is expected to improve outcomes and a pending study will evaluate this correlation [4]. A clinician may use the above-identified indicators to decide which patients require: (1) referral to a BDD specialist due to lower probability of remission; or (2) longer periods of follow-up after remission due to higher probability of relapse.

Development of Comorbid Mental Health Conditions

Patients who meet diagnostic criteria for BDD will often also develop other mental illnesses. As noted above, comorbid mental illnesses are linked with a worse prognosis. The most common diagnosis that may develop, if it is not preexisting, is major depressive disorder, with a lifetime prevalence of about 75 % [8, 35, 36]. Among BDD patients, 94% reported they had felt depressed at some point due to their illness [2]. The lifetime prevalence of a comorbid substance use disorder is 30−48.9 %, [1, 35, 37, 38] with 60 % of subjects in one study reporting that their substance use began after symptoms of BDD and 68 % reporting their illness contributed to their substance use becoming problematic [1, 37]. Among BDD patients, 42.6 % reported an alcohol use disorder and 30.1 % reported a cannabis use disorder [1, 37]. Muscle dysmorphia, a specific type of BDD, was found to have the highest rates of substance abuse at 86 % [2]. OCD and social phobia have also been found to have a high lifetime prevalence in BDD patients of 32–33 % and 37–39 %, respectively [8, 35, 36]. About 10-15 % of those with BDD have a lifetime history of anorexia nervosa or bulimia nervosa and 2–7 % of a somatoform disorder [8, 35, 36]. Treating comorbid conditions may improve chances for remission, as demonstrated for treatment of major depressive disorder and OCD [8, 31]. Though not much data exist on which BDD patients are more likely to develop which of the comorbid conditions, earlier age of onset is associated with past or comorbid eating disorders, as well as other comorbid conditions to a lesser degree [29].

Prognosis for Cosmetic Procedures

Given the many barriers to BDD patients receiving appropriate mental health treatment and the high percentage that seek cosmetic treatment, [2] many will seek intervention by a plastic surgeon, dermatologist, or dentist before they are diagnosed or evaluated by a mental health provider. Nearly all cosmetic treatment providers see patients with BDD, [2, 39, 40] whether diagnosed or not. The prognosis for an improvement in symptoms due to a cosmetic procedure is astoundingly low and interventions usually result in the exacerbation of symptoms [2, 39, 41, 42].

Depending on the study, anywhere from 3–50 % of BDD patients seek cosmetic surgery [2]. Among men seeking cosmetic surgery, 25–33 % met BDD criteria, a much higher percentage than women in the same studies [2]. Forty percent of those seeking cosmetic surgery without an obvious defect met BDD criteria [2]. About 22–40 % of BDD patients have undergone cosmetic surgeries, between two and three surgeries on average, with rhinoplasty being the most common form of surgery [2]. Besides the fact that BDD patients may be drawn to cosmetic treatments for obvious reasons, they also commonly have histories of other problems that are associated with cosmetic surgery: intimate partner violence, dieting, and general poor mental health; and in women, a history of verbal abuse or use of medications

for sleep or nervous conditions [12, 43]. Only 20 % of plastic surgeons said they would operate on a patient with BDD, [39, 40] and 84 % of cosmetic surgeons reported they had refused to operate on someone due to BDD concerns [2, 40]. However, 84 % of cosmetic surgeons realized a patient had BDD only after surgery [2, 39, 40]. For those who presented for dermatological treatment, 9–14 % were found to have BDD [2]. In fact, patients with BDD are more likely to get cosmetic treatment from a dermatologist than from any other provider, especially antiacne agents (33 % of acne patients with mild acne were found to have BDD in one study[44, 45]), with surgical procedures being the second most sought after cosmetic treatment, most often rhinoplasties [2, 39, 46].

Of BDD patients, 71–76 % seek cosmetic treatment (including surgical, dermatological, or dental treatments), and 64–66 % of individuals with BDD ultimately receive these treatments [1, 41, 46]. A study in Germany found that 7.2 % of BDD patients had received cosmetic surgery compared to only 2.8 % of the general population [1, 47]. Many BDD patients seek multiple cosmetic treatments: one woman had 35 cosmetic treatments [2]. Even 40 % of children and adolescents with BDD receive cosmetic treatments [2]. However, in a retrospective study only 3.6 % of BDD patients who had received these treatments reported an improvement in their BDD symptoms [1, 46] (another study reported the rate of improvement at 7 % [1, 41]). As noted above, symptom exacerbation is more common after a cosmetic treatment; one report indicated a patient attempted suicide after the treatment he viewed as his last hope did not satisfy him [2]. In another study, while 8 % of cosmetic treatments were followed by an improvement in BDD symptoms, 11 % were followed by worsening symptoms [2]. In other studies of BDD patients, most who received rhinoplasties experienced an increase in preoccupation and disability, [39, 42] while 83 % who received cosmetic surgery noted their BDD symptoms were subsequently the same or worse [39, 41]. Before descriptions of BDD, surgeons had already recognized certain higher risk rhinoplasty patients for whom they used the acronym SIMON (single, immature, male, over-expectant or obsessive, narcissistic), many of who would likely now meet BDD criteria [39, 48]. In patients with BDD who picked their skin, only 15 % improved with dermatological treatment while 75 % improved with a SSRI [2]. Overall, 81 % of those with BDD were dissatisfied with past medical or surgical treatments [1, 49] (while most without BDD were satisfied) [2]. Illustrating the degree of BDD patients' dissatisfaction, 40 % of plastic surgeons noted that BDD patients physically or legally threatened them [1, 40]. About one-third of BDD patients who have undergone cosmetic procedures have also attempted to perform surgery on themselves, including cutting out their body fat or filing down their teeth [2].

Quality of Life and Psychosocial Functioning

Perhaps, the most distressing aspect of BDD for patients is the effect on their careers, education, and relationships. The impairments can be devastating and undoubtedly play a large role in the exceptionally high suicide rate. BDD patients

score worse on quality of life measures than patients with a recent heart attack, clinical depression, or diabetes [1, 2, 50].

Individuals with BDD have a tendency to avoid social situations [1, 51] and often have personality traits and cognitive abnormalities that may make socializing more difficult for them. They also have a higher level of harm avoidance [8, 52], which has been correlated with behavioral inhibition in novel situations in obsessive compulsive disorder (OCD) [8, 53]. Studies have also shown that those with BDD, as compared to healthy controls, are more perfectionistic [8, 54], with lower levels of extraversion and higher neuroticism [8, 55]. Those diagnosed with the disorder have deficits in organizational strategy, tend to focus more on the details of visual stimuli, [8, 56] have more negative and threatening interpretations of ambiguous social information [5, 57], and misinterpret emotional expression as anger [8, 58].

In a compilation of studies that included over 500 patients, 99 % of patients with BDD reported their illness interfered with social functioning, and 95 % had periods of social activity avoidance [2]. Their social functioning was worse than 95 % of people in the community when assessed on the social adjustment scale [2]. Individuals with BDD are less likely to be married, with only 21 % married in one sample, and more likely to be divorced, with 28 % divorced in the same sample [1, 2, 47]. While some with BDD may indiscriminately seek sexual relationships for validation of their bodies, factors, such as self-consciousness, fear of rejection, shyness, and low self-esteem, make long-term relationships challenging [2].

Patients with BDD often become so self-conscious that it interferes with their work, school, and everyday endeavors, such as using public transportation and participating in leisure activities [2]. Due to BDD, 99 % reported interference with work or academic functioning and 80 % had periods of complete avoidance of work, school, or one's role at home [2]. Problems in taking care of their children or other family members and difficulty completing household chores or errands were reported by 80 % of patients [2]. On average, those with BDD missed 52 days of work and 49 days of school during their lifetimes due to their symptoms [2].

It is not surprising, given all these difficulties, that BDD subjects have lower average incomes [2]. Of those with the illness, 23 % were shown to be receiving disability income, 38 % were unemployed, and 39 % reported not working in the previous month due to psychopathology [1, 59]. Less than half of subjects in the same study were working full-time, and of those who worked in the previous month, 80 % reported impairment in functioning at work due to BDD [59]. Those with more severe or chronic BDD were shown to be less likely to be working than those with less severe or less chronic BDD [59]. A study in Germany also demonstrated marked socioeconomic difficulties among those with BDD, as those with BDD had significantly lower incomes and higher rates of unemployment (21 % were unemployed vs. 7 % of the non-BDD subjects) [47].

Medical and psychiatric care and hospitalization as well as interrupted education contribute to the economic cost of BDD. Studies have shown that 27–31 % of patients with BDD have been completely homebound for at least a week and 40 % have been psychiatrically hospitalized [1, 35, 60]. Approximately 20 % of young persons with BDD reported dropping out of school due to associated symptoms [1, 33, 61].

Though individuals with BDD can be preoccupied with any part of the body, the most common areas are skin (80%), hair (57.5%), and the nose (39%) [1, 35]. Over their lifetimes, those with BDD are likely to be preoccupied with 5–7 different body parts on average, [1, 35] and while 40% will spend 3–8 h/day thinking about the distress-causing parts, 25% will spend more than 8 h/day [1, 62]. Almost all BDD patients will perform repetitive behaviors that are not experienced as pleasurable such as camouflaging disliked body parts (92%), mirror checking (90%), and skin picking (44%) [1, 35]. About half will spend more than 3 h/day engaged in these repetitive behaviors, which are hard to resist or control [1, 63]. Other common behaviors that may develop include excessive grooming, tanning, reassurance seeking, repetitively touching areas of the body that cause distress, and frequent changing of clothes [1, 35].

Suicidality and Violence

The most worrisome and devastating outcomes of BDD are suicide and violence, which are surprisingly common in individuals suffering from this illness [1, 2, 6, 9]. Rates of completed suicide and suicidal thinking in individuals with BDD are very high, possibly higher than any other mental illness [2, 6, 9, 64]. Violence, especially towards providers of cosmetic treatments, has also been reported [1, 2, 11, 40]. The high rates of suicide and violence are likely to stem from the severe social stressors mentioned in the previous section (high rates of unemployment, divorce, lack of support, comorbid conditions, thinking that others mock their appearance, and spending hours every day on compulsive behaviors). The interpersonal psychological theory of suicide may explain the high rates of suicide, as BDD appears to engender the four psychological constructs thought to predict suicide: perceived burdensomeness, thwarted belongingness, low fear of death, and high physical pain tolerance [65].

About one quarter of the patients with BDD will make a suicide attempt. Suicidal thoughts are experienced by 80% over their lifetime and 58% each year, [6] with the suicidal thoughts usually attributed to the illness [1, 2, 6, 9]. In one prospective study, 0.3% of BDD patients died from suicide annually [6]. That rate is 37 times higher than the general suicide rate in the USA, and if validated, is higher than the rates of completed suicide found in similar studies in depression and panic disorder, [10, 66, 67] and higher than the rate of completed suicide for nearly any other mental illness [2]. Furthermore, the standardized mortality ratio found in BDD was shown to be 45 times higher than the general population and higher than almost all other mental disorders [1, 6, 68]. Comparatively, the standardized mortality ratios for eating disorders, major depressive disorder, and bipolar disorder are much lower at 23, 20, and 15, respectively [10, 68]. While larger studies are needed to validate such remarkably high rates of completed suicide and overall mortality, existing evidence is disheartening. One study established a higher rate of suicidal thoughts for BDD than those reported for schizophrenia or major depressive disorder [9, 69].

A retrospective study over 20 years in 2 dermatology clinics found that most of the 16 patients who committed suicide had acne or BDD [9, 70]. The concept of "cutaneous body image dissatisfaction," used in dermatology settings, is associated with suicide and self-harm [44, 71–74]. Rates of suicidality may be even higher in adolescents with BDD; one study showed they were almost twice as likely to report a history of suicide attempts as compared to adults, [1, 33] and adolescents with BDD scored significantly higher on a suicide risk assessment than their peers on an inpatient psychiatric unit [1, 27]. The highest suicide rate was found among men with the muscle dysmorphia subtype of BDD, with 50 % having attempted suicide [2]. The available data not only indicate that the rate of suicidal thoughts for patients with BDD may be higher than any other mental illness, [9, 64] but also indicate that the severity of suicide attempts is 3–12 times more serious than the average suicide attempt [2]. In addition, communication to others concerning suicidal intent is uncommon [9].

About one-third of individuals with BDD report violent or aggressive behaviors related to BDD symptoms such as attacking others or damaging property [1, 2, 11]. About 40 % of plastic surgeons have been threatened by BDD patients, [39, 40] and 12 % of plastic surgeons have been threatened with physical violence [1, 40]. In fact, BDD patients have even killed their plastic surgeons due to dissatisfaction with a cosmetic procedure [1, 75]. One man was imprisoned after he set off a bomb as he was so upset about his illness [2]. Violence is thought to be triggered by anger about appearance, inability to fix the perceived defect, and feelings of being mocked or rejected as a result of appearance [1]. The only factor shown to be associated with increased physical violence is early age of BDD onset [29].

Considering such high rates of violence and especially suicide, it is imperative that any provider who sees a patient with suspected BDD at least assesses for suicide risk and refers the patient for appropriate mental health care. The dysmorphic concern questionnaire is a quick and effective way to identify those with BDD [39, 76]. SSRIs and cognitive behavioral therapy can decrease suicidal thoughts and behaviors in BDD patients [9, 77, 78].

Conclusion

BDD is a serious, and often chronic, condition. High rates of comorbidity and profound detrimental effects on psychosocial functioning underlie markedly poor quality of life and an alarmingly high suicide rate. Yet, those with BDD often seek cosmetic treatments, which often worsen the severity of their illness, rather than mental health treatments that can improve outcomes. Effective mental health treatment can not only relieve the persistent and severe suffering of patients with BDD but also may very well prevent the intractable guilt and sadness for those left behind after a suicide. The prognosis for those with BDD is decidedly poor, especially if not referred for mental health treatment.

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Chapter 14
Approach and Resources

Neelam A. Vashi and Mayra Buainain de Castro Maymone

General Tips for Caring for Those with Suspected BDD

1. Empathize with the patient.
2. Act in a nonjudgmental way.
3. Do not comment on the perceived defect.
4. Do not offer cosmetic treatments.
5. Ask about suicidal thoughts.
6. Familiarize yourself with resources and offer patients information regarding the disorder.
7. Refer the patient to an appropriate mental health expert.
8. Recognize that patients may not accept the referral.
9. Decide your comfort level with starting treatment.

Empathize with the patient. Statements such as "sorry for the suffering," "I understand that you are experiencing much anxiety," or "I think that there is a way for you to feel better" may be helpful, while also not acknowledging the actual appearance complaint.

Approach the patient in a calm and nonjudgmental way. Many are ashamed and feel misunderstood. Do not compare those with body dysmorphic disorder (BDD) to other people in terms of appearance or functioning as this may make them feel worse.

Do not argue with patients about how they look, discuss appearance at length, or try to talk persons out of their faulty beliefs [1]. Comments such as "you look fine," "did not notice it," and "not that bad" do not work. Although certain individuals,

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typically those with some insight, may benefit from the occasional reminder that their view is wrong and due to a mental disorder, the majority will not believe your comments to be true. Even if a response does temporarily improve symptoms, this short-lived relief fuels more attempts to again obtain this reassurance. Therefore, the main objective is to not comment on the appearance.

Do not offer cosmetic treatments. If you have already provided treatment, be willing to stop and avoid being defensive. If a patient is suspected but unknown to have BDD, avoid all invasive procedures; however, it may be acceptable to provide a minimally invasive procedure that is relatively inexpensive and not permanent, and reevaluate on follow-up. Although the vast majority should be excluded from surgery, a group of authors describe a subset of patients with the "Thersites complex," who may be candidates for cosmetic correction after careful selection [2]. The authors describe those with this complex as having excessive preoccupation with an actual but minor bodily defect or anomaly. Relative indications include a minimal real deformity (Thersites complex) with excessive concern, realistic expectations, acceptable surgical risks, and operative feasibility. Of note, many contraindications are discussed including multiple previous surgical operations, aggressive behavior, unacceptable surgical risk, and psychoses.

Always ask about suicidal ideation. Immediate treatment is needed for any patient with suicidal thought. Rates of attempted and completed suicide are surprisingly very high in those with BDD, possibly higher than any other mental illness [3–6].

Familiarize yourself with those in your community who can offer help, support, and treatment for your patients. See the below list of national and international resources.

Refer the patient to a mental health expert in your area. Once suspected, it is imperative that a patient receive appropriate psychiatric treatment from a mental health expert familiar with BDD. When making the referral, remain calm, nonjudgmental, matter-of-fact, and empathetic. If a patient is hesitant or refuses to get mental health treatment, try changing the focus on the suffering he or she is experiencing and the effect of this on his or her quality of life and everyday functioning. Focus on the *time* spent on every day *worry*, the *stress* on his or her mind and body because of intrusive thoughts, and the inability to live a normal life. Discuss his or her lack of control and how the thoughts and obsessions are, in fact, controlling his or her life [1]. Encourage a trial of treatment, and discuss that he or she does not necessarily have to be on it for his or her entire life. If mild and with some insight, refer the patient to a mental health expert with experience in cognitive-behavioral therapy (CBT) and BDD. If moderate, the patient can be started on a selective serotonin reuptake inhibitor (SSRI) or referred to a CBT specialist, or both. If severe, the patient needs to be on an SSRI and referred to a mental health expert. BDD can be life-threatening so always inquire into suicidal thoughts.

Recognize that patients may not accept the referral. If a patient is insistent upon cosmetic care and has poor to absent insight, one can try referral to psychiatry as a standard protocol.

Decide your comfort level with starting SSRIs. If patients are delusional, suggest trying an SSRI to help other symptoms that have become associated, that is,

depressed mood. Alternatively, suggest trying an SSRI as an experiment to see how it will affect mood and symptoms. After patients' symptoms improve, they may be more amenable to referral to a trained expert.

Approach to Diagnosis

1. Be willing to ask simple screening questions.

   Are you very worried about your appearance or certain features?
   Do you think about your appearance a lot and wish you could think about it less?
   Does your appearance upset you a lot?
   Has it caused you any problems with work, school, or relationships?
   Are there things you avoid because of your appearance?

2. Familiarize yourself with screening questionnaires.
3. Look for red flags.

The initial consultation is the first means in establishing a physician–patient relationship. This consultation can incorporate simple screening questions for the practitioner to better understand patient motivations and concerns. If suspected, simple screening questionnaires can be administered. The Body Dysmorphic Disorder Questionnaire and Body Dysmorphic Disorder Questionnaire—Dermatology Version are both simple, short questionnaires that can be administered in the waiting room as an effective way to identify those who may have symptoms of BDD. See Chap. 11.

Look for red flags that may be indicators of underlying pathology. Red flags include doctor shopping with dissatisfaction of results; checking appearance in mirrors excessively; seeking reassurance; using makeup and clothing to cover up defects; making statements indicating impairment in work, school, or social realms; and spending substantial amounts of time thinking about or trying to camouflage the defect.

Approach to Therapy

Prescribing SSRIs

1. Obtain a medication history as SSRIs should not be given with some medications, such as monoamine oxidase inhibitors.
2. Calm the patient about misconceptions and concerns regarding the medication.
3. Start with a low dose.
4. Increase the dose gradually while monitoring for side effects.
5. Make sure the medication is dosed appropriately at a high enough dose for at least 12–16 weeks.

6. After improvement for several months, a slow and gradual lowering of dose can be attempted to see if a lower dose works equally as well.
7. Switch to a different SSRI if the medication is not efficacious after an appropriate trial.
8. Add a medication if the medication partially works.
9. Do not stop the SSRI abruptly. It should be gradually tapered.

SSRIs are generally safe and well tolerated. No pretreatment labs are required. Side effects are typically infrequent and mild-moderate in nature. They are more likely to occur early in treatment and/or when the dose is raised. They may improve or disappear on their own with time. In addition, a slower up titration or lowering the dose can give the body time to adjust and diminish side effects. Reported side effects include fatigue, nausea, sexual dysfunction, insomnia, decreased appetite, jittery sensations, and sweating. These will resolve upon discontinuation of the medication.

Prior to starting an SSRI, make sure to address patient concerns and misconceptions. SSRIs are not addictive or habit forming. Although occasionally patient may experience fatigue or agitation, they act normal and not "drugged" or "high." They are overall well-tolerated with minimal side effects. A patient may state that a particular SSRI did not work in the past; however, discuss that it may not have worked because it was not given at a high-enough dose for a long-enough period of time. SSRIs need to be taken every day, at the highest dose tolerated for 3–4 months to indicate an appropriate treatment trial [1]. If an appropriate trial was made, another can be tried as patients can respond differently to different SSRIs. Alternatively, if a patient had a partial response to an appropriate trial, another medication can be added to the regimen.

Start with a low dose, and gradually increase the dose, while monitoring for side effects. For example, a dose can typically be increased after 2 weeks. A reasonable goal is to the reach the maximum dose based on package insert within 4–9 weeks of starting the medication [1]. Make sure the medication is dosed appropriately as BDD often needs higher than typical dosages. An appropriate medication trial involves the patient taking the medication for at least 12–16 weeks. The dosage should be at the highest tolerated or maximum recommended for 3 of these weeks before concluding that the medication is ineffective [1]. Once improvement is seen for several months, a slow and gradual lowering of dose can be attempted to see if a lower dose works equally well. If the medication is not efficacious after an appropriate trial, try switching to a different SSRI. If the medication works partially, another medication can be added to improve efficacy. At this point, a psychiatrist and/or other trained medical experts should be involved. Make sure to never stop SSRIs abruptly. They should be gradually tapered.

Behavior Tactics that Can Be Offered

1. Habit reversal
2. Activity scheduling
3. Vocational rehabilitation

Patients who are motivated and accept their diagnosis will likely benefit from CBT. CBT should be administered by a trained professional with BDD experience; however, some behavioral tactics can be offered. Habit reversal can be suggested prior to official CBT initiation. Habit reversal begins with awareness training in that the patient first writes down detailed information about the behaviors. Then alternative behaviors are offered to compulsive behaviors (e.g., skin picking), such as clenching one's fists or knitting. Activity scheduling involves the act of actually scheduling activities throughout the day in an appointment book. This is an attempt to minimize idle time so as to leave less time for BDD obsessions and compulsive behaviors. Vocational rehabilitation may be helpful for those who have been unemployed for a lengthy amount of time. The first step may be a volunteer job, which also decreases idle time [1].

Resources

National

Alexian Brothers Behavioral Health Hospital's Center for Anxiety and Obsessive Compulsive Disorders
1650 Moon Lake Boulevard
Hoffman Estates, IL 60169
Phone: 847-755-8566
Web: http://www.abbhh.org

Antioch Group
615, N. Big Hollow Road
Peoria, IL 61615
Phone: 309-692-6622
Web: http://www.antiochgroup.com

Anxiety and Obsessive Conpulsive Disorder Clinic
W.O. Walker Building, Suite 1155A
10524 Euclid Ave
Cleveland, OH 44106
Phone: 216-983-5883
Web: www.uhhospitals.org

Anxiety and Stress Disorders Clinic—University of North Carolina at Chapel Hill
University of North Carolina at Chapel Hill
Department of Psychology, CB#3270, Davie Hall
Chapel Hill, NC 27599
Phone: 919-843-8170
Web: http://clinic.unc.edu/anxiety-clinic/

Anxiety Disorder Center at The Institute of Living
200 Retreat Avenue
Hartford, CT 06106
Phone: 860-545-7685
Web: http://www.instituteofliving.org/adc

Anxiety Disorders Clinic of Hampton Roads
403 Greenbrier Parkway
Chesapeake, VA 23320
Phone: 757-410-0700
Web: http://www.anxietydisordersclinic.net/

Anxiety Disorders Treatment Center (Reid Wilson)
421 Bennett Orchard Trail
Chapel Hill, NC 27516
Phone: 866-774-9511
Web: http://www.anxieties.com/weekend.php

Anxiety Solutions of Northern England
P.O. Box 70
Raymond, MA 04071
Phone: 207-655-2737
Web: http://www.anxietysolutions.net/

Anxiety Treatment Center of Sacramento
9300 Tech Center Drive, Suite 250
Sacramento, CA 95827
Phone: 916-366-0647
Web: http://www.anxietytreatmentexperts.com

Association for Behavioral and Cognitive Therapies
305 7th Avenue
New York, NY 10001
Phone: 212-647-1890
Web: http://www.abct.org/home/

Behavioral Sciences of Alabama Intensive Outpatient Program
810 Shoney Drive, Suite 120
Huntsville, AL 35801
Phone: 256-883-3231
Web: http://www.behavioralsciencesofalabama.com/

Bio-Behavioral Institute
935 Northern Boulevard, Suite 102
Great Neck, NY 11021
Phone: 516-487-7116
Web: www.bio-behavioral.com

Bradley Hospital Intensive Program for OCD
1011 Veterans Memorial Parkway
East Providence, RI 02195
Phone: 401-432-1516
Web: http://www.bradleyhospital.org/The_OCD_Intensive_Outpatient_Program.html

Center for Cognitive-Behavioral Psychotherapy
37 East 36th Street, Suite #4
New York, NY 10016
Phone: 212-686-0943
Web: http://www.cognitivebehavioralcenter.com/

Center for OCD and Anxiety-Related Disorders—Saint Louis Behavioral Medicine Institute
1129 Macklind Avenue
St. Louis, MO 63105
Phone: 314-534-9427
Web: http://www.slbmi.com/

Center for Psychological & Behavioral Science
1641 Kew Gardens Avenue, Suite 207
Palm Beach Gardens, Florida 33410
Phone: 561-444-8040
Web: http://www.psychologyandbehavior.com/

Child Mind Institute—Anxiety & Mood Disorders Center; Pediatric Obsessive-Compulsive Spectrum Disorders Program
445 Park Avenue
New York, NY 10022
Phone: 646-625-4252
Web: http://www.childmind.org/

Cognitive Behavior Therapy Associates
300 Trade Center, Suite 7790
Woburn, MA 01801
Phone: 339-224-7695
Web: http://www.cbtallc.com

Compulsive and Impulsive Disorders Program
Mount Sinai School of Medicine
One Gustave L. Levy Place
P.O. Box 1230
New York, NY 10029
Phone: 917-492-9449
Web: www.mssm.edu/psychiatry/ciadp/index.shtmt

Doorways Adolescent OCD Intensive Outpatient Program
1825 East Northern, Suite 200
Phoenix, AZ 85020
Phone: 602-997-2880
Web: http://www.doorwaysarizona.com/

Kansas City Center for Anxiety Treatment
0555 Marty Avenue, Suite 100
Overland Park, KS 66212
Phone: 913-649-8820 ext 1
Web: http://www.kcanxiety.com

Los Angeles Body Dysmorphic Disorder and Body Image Clinic
10850 Wilshire Boulevard, Suite 240
Los Angeles, CA 90024
Phone: 310-741-2000
Web: www.bddclinic.com

Massachusetts General Hospital/McLean Hospital—OCD Institute at McLean Hospital
McLean Hospital
115 Mill Street
Belmont, MA 02478
Phone: 617-855-3279
Web: www.mclean.harvard.edu/patient/adult/ocd.php

Mayo Clinic Child and Adolescent Anxiety Disorders Program
Mayo Clinic, West 11
200 First Street, SW
Rochester, MN 55905
Phone: 507-266-5100
Web: http://mayoresearch.mayo.edu/mayo/research/whiteside_lab

McLean Anxiety Mastery Program
799 Concord Avenue
Cambridge, Massachusetts 02138
Phone: 617-674-5333
Web: http://www.mcleanhospital.org/programs/mclean-anxiety-mastery-program

Menninger Clinic OCD Treatment Program
2801 Gessner Drive
Houston, TX 77080
Phone: 800-351-9058
Web: http://www.menningerclinic.com/p-ocd/index.htm

National Alliance on Mental Illness
Colonial Place Three
2107 Wilson Boulevard, Suite 300

Arlington, VA 22201-3042
Phone: 703-524-7600
Web: www.nami.org

NeuroBehavioral Institute
2233 North Commerce Parkway, Suite 3
Weston, FL 33326
Phone: 954-217-1757
Web: http://www.NBIWeston.com

Obsessive Compulsive Foundation
112 Water Street, Suite 501
Boston, MA 02119
Web: http://iocdf.org/

OCD Center at Cedar Ridge & Cognitive Behavioral Therapy Services at Rogers Memorial Hospital
OCD Center and CBT Services Rogers Memorial Hospital
34700 Valley Road
Oconomowoc, WI 53066
Web: http://www.rogershospital.org

OCD Center of North Shore
Zucker Hillside Hospital, Ambulatory Care Pavilion
75-59 263rd Street
Glen Oaks, NY 11004
Phone: 718-470-8052
Web: https://www.northshorelij.com/find-care/locations/obsessive-compulsive-disorder-center

OCD Institute at the Center for Understanding and Treating Anxiety at San Diego State University
6386 Alvarado Court, Suite 301
San Diego, CA 92120
Phone: 619-229-3740
Web: http://nas.psy.sdsu.edu/

OCD Resource Center of Florida
4901 NW 17th Way, Suite 101
Ft. Lauderdale, FL 33309
Phone: 954-962-6662
Web: http://www.ocdhope.com

Pacific Anxiety Group
845 El Camino Real
Menlo Park, CA 94025
Phone: 650-762-8352
Web: http://www.pacificanxietygroup.com/

Psychological Care & Healing OCD Intensive Treatment Program
11965 Venice Boulevard, Suite 202
Los Angeles, CA 90066
Phone: 310-566-7625
Web: http://www.pchtreatment.com/

Renewed Freedom Center for Rapid Anxiety Relief
1849 Sawtelle Boulevard, Suite 543
Los Angeles, CA 90025
Phone: 310-268-1888
Web: http://www.renewedfreedomcenter.com/

Rogers Memorial Hospital—Milwaukee
11101 W. Lincoln Avenue
Milwaukee, WI 53227
Phone: 1-800-767-4411
Web: https://www.rogershospital.org/residential-center/obsessive-compulsive-disorder-center

Sage Anxiety Treatment Program
601 University Avenue, Suite 225
Sacramento, CA 95825
Phone: 916-614-9200
Web: http://www.sagepsychotherapy.org/

South Texas OCD Clinic
262 North Union Street
New Braunfels, TX 78130
Phone: 830-708-0114
Web: http://www.ocdsouthtexas.com/

Spectrum CBT
1081 Westwood Boulevard, Suite 212
Los Angeles, CA 90024
Phone: 310-857-6517
Web: http://spectrumcbt.com/ocd/

Steven Pence, PhD., LLC
3030 Starkey Boulevard, Suite 128
New Port Richey, FL 34655
Phone: 727-569-2239
Web:http://www.ocdandanxietytreatment.com/Steven_Pence/Dr._Steven_Pence.html

Stress & Anxiety Services of New Jersey
A-2 Brier Hill Court
East Brunswick, NJ 08816
Phone: 732-390-6694

Web: http://www.stressandanxiety.com

The Anxiety Treatment Center of Greater Chicago
656 West Randolph, Suite 4W
Chicago, IL 60661
Phone: 312-441-1300
Web: http://www.anxietytreatmentcenter.com

The Anxiety Treatment Center of Greater Chicago (Deerfield Office)
707 Lake Cook Road, Suite 310
Deerfield, IL 60015
Phone: 847-559-0001, ext. 3

The Body Dysmorphic Disorder Program
Rhode Island Hospital Coro Center West, Suite 2.030
One Hoppin Street
Providence, RI 02903
Phone: 401-444-1646
Web: http://www.rhodeislandhospital.org/bdd

The Center for Emotional Health of Greater Philadelphia
1910 Route 70, East Suites 7 & 5
Cherry Hill, NJ 08003
Phone: 856-220-9672
Web: http://www.thecenterforemotionalhealth.com

The Gateway Institute
950 South Coast Drive, Suite 204
Costa Mesa, CA 92649
Phone: 714-549-1030
Web: http://www.gatewayocd.com/

The Houston OCD Program
1401 Castle Court
Houston, TX 77006
Phone: 713-526-5055
Web: http://www.HoustonOCDProgram.org

The Lindner Center of HOPE: OCD and Anxiety Disorder Treatment Programs
4075 Old Western Row Road
Mason, OH 45040
Phone: 513-536-0532
Web: http://lindnercenterofhope.org/

The OCD and Related Disorders Program—Body Dysmorphic Disorder BDD Clinic and Research Unit
Massachusetts General Hospital and Harvard Medical School
Simches Research Building

185 Cambridge Street
Boston, MA 02114
Phone: 617-726-6766
Web: www.massgeneral.org/bdd/

The Reeds Center
7 West 36th Street, 15th Floor
New York, NY 10018
Phone: 212-203-9792
Web: http://thereedscenter.com/

UCLA Body Dismorphic Disorder Research Program
Semel Institute for Neuroscince and Human Behavior
David Geffen School of Medicine
300 Medical Plaza
Los Angeles, CA 90095
Phone: 310-206-4951
Web: www.npi.ucla.edu/bdd

UCLA OCD Intensive Treatment Program
Resnick Neuropsychiatric Hospital, UCLA
300 UCLA Medical Plaza
Box 956968
Los Angeles, CA 90090-6968
Phone: 310-794-7305
Web: http://www.semel.ucla.edu/adc/ocd_treatment

University of California at San Diego OCD Program
8950 Villa La Jolla Drive, Suite B225
La Jolla, CA 92037
Phone: 858-534-6200
Web: http://health.ucsd.edu/specialties/psych/clinic-based/Pages/ocd.aspx

University of Florida OCD Program
P.O. Box 100234
Gainesville, FL 32610
Phone: 352-265-4357
Web: https://ufhealth.org/medical-psychology-shands-uf

University of Pennsylvania Child/Adolescent OCD, Tics, Trichotillomania & Anxiety Group (COTTAGe)
3535 Market Street, 6th Floor
Philadelphia, PA 19104
Phone: 215-746-1230
Web: http://www.med.upenn.edu/cottage/

University of South Florida OCD, Anxiety, & Related Disorders Behavioral Treatment Program
University of South Florida Rothman Center for Neuropsychiatry
880 6th Street South, Suite 460
St. Petersburg, FL 33701
Phone: 727-767-8230
Web: rothmanctr@health.usf.edu

Western Psychiatry Institute and Clinic (Adult Program)
100 North Bellefield Ave, 4th Floor
Pittsburgh, PA 15213
Phone: 412-246-5600, option 1
Web: laterzatl@upmc.edu

Western Psychiatry Institute and Clinic (Child Program)
1011 Bingham Street
Pittsburgh, PA 15203
Phone: 412-235-5354
Web: http://wpic.upmc.com/ocd.htm

Westwood Institute for Anxiety Disorders
921 Westwood Boulevard, Suite 223
Los Angeles, CA 90024
Phone: 310-443-0031
Web: http://www.hope4ocd.com

Yale OCD Research Clinic
34 Park Street, 3rd floor, CNRU
New Haven, CT 06519
Phone: 203-974-7523; Toll Free: 1-855-OCD-YALE
Web:http://info.med.yale.edu/psych/clinics/OCD%20Research%20Clinic/OCDindex.htm

International

Anxiety Disorders Residential Unit
Bethlem Royal Hospital Dower House
Monks Orchard Road
Beckenham, Greater London BR3 3BX
Phone: 44-203-228-4146
Web: http://www.veale.co.uk/

Anxiety Support
Mental Health Advocacy and Peer Support Trust
P.O Box 33 332 Christchurch 8244, New Zealand
Phone: 64-3-377-9665
Web: www.anxietysupport.org.nz

BDD Treatment Programme
The Priory Hospital, North London, England
Grovelands House, Southgate, London N14 6RA, UK
Phone: 020-8882-8191
Web: http://www.priorygroup.com/mental-health/body-dysmorphic-disorder

Canada OCD Network
938W. 28th Avenue
Vancouver, BC V54H4
Phone: 604-898-9355
Web: canadiannocdnetwork.com

Center for Anxiety Disorders & Trauma
99 Denmark Hill, London SE5 8AF, UK
Phone: 020-3228-2101 or 020-3228-3286
Web: http://www.national.slam.nhs.uk/services/adult-services/cadat/

Cognetica: The Israeli Center for Cognitive Behavioral Therapy
48 Derech Menachem Begin
Tel Aviv, Israel
Phone: 972- 3-6390191
Web: http://www.stop-obsessing.com/

Dwang.eu
Menno Oosterhoff
Schutterlaan 20
9797 PC Thesinghe, Netherlands
Web: www.dwang.eu/

Obsessive Compulsive Spectrum Disorders
154 Main Road Sea Point, The Equinox Building
Office Suite 403
Cape Town
8005
Phone: 021-433-1721
Web: rosensteind@gmail.com

OCD Action
Davina House, Suite 506-507, 137-149 Goswell Road, London EC1V 7ET, UK
Phone: 020-7253-5272
Web: www.ocdaction.org.uk

OCD & Anxiety Support Hong Kong
Minal Mahtani
41-A Stubbs Road
D1-18th Floor Hong Kong
Phone: 852-6108-1162
Web: www.ocdanxietyhk.org/

OCD China
19#Xinjiekouwaidajie Haidian District, Beijing, 100875
1514 Houzhulou Beijing Normal University
Phone: 150-1003-7261
Web: http://www.ocdchina.cn/

OCD Ireland
24 Premier Square
Finglas Road
Dublin 11, Ireland
Web: https://sites.google.com/site/2920383/

OCD Japan
Masaru Horikoshi, PhD
Web: https://sites.google.com/site/ocdjapan/home

OCD Ohanashikai
1 Chome-1 Nakachō
Musashino-shi
Tōkyō-to, Japan
Web: http://kyou89.fc2web.com/

Osservatorio sul Disturbo Ossessivo-Compulsivo (OCD Observatory)
Via Passariello 180
Parco Poggio della Macchia
Pomigliano d'Arco, Napoli 80038
Phone: 39-081-19917429
Web: http://www.palestracognitiva.com/

The South African Depression and Anxiety Group
P.O. Box 650301
Benmore, 2010 South Africa
Phone: 011-262-6396
Web: www.sadag.org and www.ownocd.ning.com

Svenska OCD-forbundet Ananke, OCD UK
P.O. Box 89055
Nottingham, NG10 9AU
Phone: 0845-120-3778
Web: www.ocduk.org

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