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## Psychological Approaches for Low Sexual Arousal

Charmaine Borg and Peter J. de Jong

### The Nature of the Problem

#### Low Sexual Arousal and Related Problems

When a person is exposed, or anticipates becoming exposed, to sexual cues and stimuli, this will generally elicit sexual arousal. Sexual arousal, in turn, facilitates approach tendencies and inhibits the experience of negative emotions (Borg, 2013; Borg & de Jong, 2012). Hence we would expect that, in a sexually asymptomatic person, arousal-related physiological changes (such as achieving and maintaining an erection, or engorged sexual tissues of the vulva and clitoris) enable pleasurable and functional sexual engagement (Munarriz, Kim, Goldstein, & Traish, 2002).

However, sexual arousal is not that simple. Although a person may feel desire and want to have sex, actually becoming sexually aroused is problematic for many men and women. In other words, a person can crave sexual engagement but does not feel wet or cannot hold an erection for long enough to feel satisfied. The National Health and Social Life Survey (NHSLs) reported prevalence rates of 43% and 31% for sexual disorders in women and men, respectively (Laumann, Gagnon, Michael, & Michaels, 1994; Laumann, Paik & Rosen, 1999). In some samples, up to 76% of women report being regularly affected by low sexual arousal, which causes

significant personal or relational distress in up to half of them (Brotto, Bitzer, Laan, Leiblum, & Luria, 2010; Munarriz et al., 2002). When such problems persist and occur independently of context, we speak of disorders of sexual functioning. In the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-5; American Psychiatric Association, 2013), disorders of desire and arousal are combined into sexual interest/arousal disorder in women or in men.

Evidently many psychological and physiological processes work together to produce sexual arousal, so there are many possibilities that can hinder this process. Problems with sexual arousal can be expressed as an irregularity in any stage of the sexual response cycle, and these responses/symptoms may appear as an aversion to and avoidance of current or future sexual contact with a partner. For instance in women, there may be a lack of or minimal lubrication, making sexual activity harsh, which may be perceived by the partner as her not getting “wet” for him/her, whereas in men there may be problems in attaining or maintaining an erection, and consequently an inability to have intercourse.

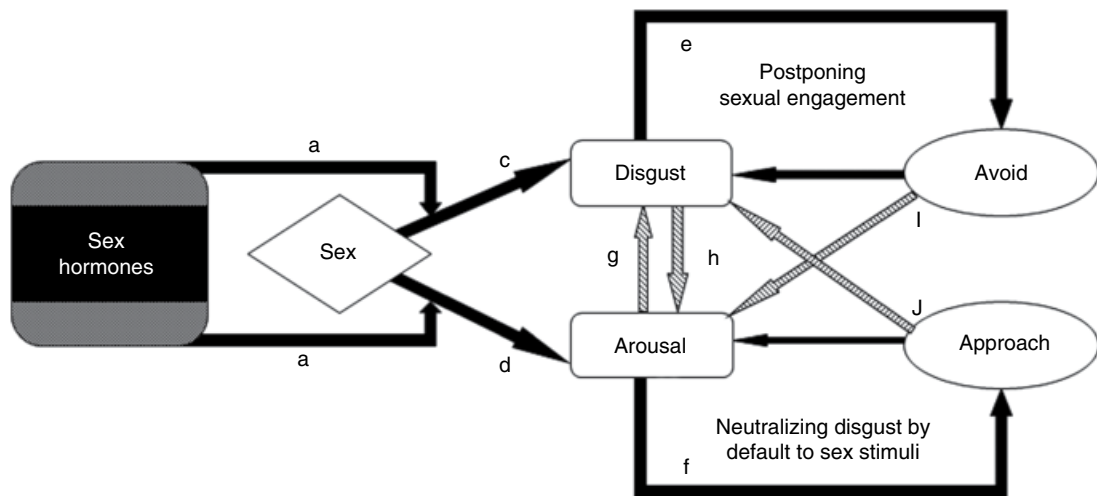
Therefore, the behavioral effects of low sexual arousal and the perceived rejection in its turn can initiate a whole new circle of problems including strain on the relationship, mental stress, and anxiety (Heiman, 2002). To the extent that one’s mating ability is an important feature of the core self, the feeling of being rejected by

one's partner or an inability to get sexually aroused can also lead to what is referred to as self-disgust. This feeling of revulsion directed toward the self can result from an intense violation that impairs parts of the core self in such a way as to distance oneself from the damaged parts of the self. Specific sexual behaviors or memories of such behaviors may thus give rise to self-disgust, which in turn is very likely to impair sexual functioning (de Jong & Borg, 2015). Besides, sexual health is related to quality of life and emotional well-being. Even for people who do not experience enduring negative consequences from low sexual arousal, or for whom low sexual arousal is only an occasional symptom, it can still be highly disturbing. It is therefore important to identify the mechanisms underlying (disturbed) sexual arousal.

Sexual arousal should be conceptualized as a multicomponent process that is triggered by specific stimuli and expressed through changes in different response systems, including cognitive,

physiological, and behavioral responses (approach/inhibition; e.g., Everaerd, Laan, Both, & Spiering, 2001). As illustrated in Figure 18.1, a sexual stimulus that is considered or appraised as rewarding will facilitate (sexual) arousal. When a person becomes aware of being sexually aroused, she/he will cognitively elaborate on the sexual stimulus, devote his/her attention to it, and in this process create distance from other distractors or inhibitors (e.g., ambiguous cues and their negative interpretation). In turn, when this results in a positive evaluation, sexual arousal is experienced. These ongoing sexual responses may then trigger the motivation to actually engage in sexual activity. Once the person is engaged in sexual activity, contact is expected to facilitate (subjective and physiological) arousal and to attenuate the relevance of negative emotions (e.g., disgust, anxiety, fear).

It should be noted that the model discussed in this chapter (Figure 18.1) is mainly psychological in nature, yet physical markers and biological



**Figure 18.1** Giving in to arousal or staying stuck in disgust (adapted from de Jong et al., 2013). Black arrows indicate excitation; gray arrows refer to inhibition. Arrow a may indicate excitation and/or inhibition. The model holds that when a sexually mature person is exposed to sexual stimuli, it elicits sexual arousal (d), which facilitates approach (f) and inhibits the experience of negative emotions (g, j). Sexual stimuli can also elicit disgust (c), which motivates avoidance (e) and hinders sexual arousal (h). Anecdotal evidence suggests that sexual stimuli for children elicit disgust responses (c) which changes with sexual maturation. For a variety of reasons this disgust may not be neutralized (e). If this shift in disgust responding does not occur, it disrupts sexual arousal and is a risk factor for developing sexual disorders.

correlates relate to the cognitive, emotional, and behavioral processes underlying sexual arousal. That is, sexual emotions unfold at the psychological level but are defined in hormonal and neurobiological processes (see also Dewitte, 2012; Janssen, Everaerd, Spiering, & Janssen, 2000). Among these, sex hormones (e.g., androgens) are especially important because they alert the brain reward system to the incentive properties of sexual stimuli, which then triggers a flow of psychological processes, resulting in sexual motivation and sexual arousal (Bancroft, 2005). The relevance of androgens and its link to sexual motivation (as illustrated in Figure 18.1) will be discussed in greater depth later in this chapter. It should be noted that other specific hormones such as dopamine, estrogen, progesterone, and oxytocin are known to be involved in the anticipation, consummation, and reward stages of sexual arousal but will not be examined in detail here.

As already mentioned, the starting point of this chapter is the observation that all these dynamic processes should lead to either excitation and approach or hesitation due to inhibition (de Jong, van Overveld & Borg, 2013, fig. 1). Of course the context (e.g., feedback from partner) is of high relevance when discussing sexual arousal. That is, sex often takes place in the context of a relationship, and is thus strongly influenced by partner responses and relational features (Dewitte, 2014). However, we have decided to focus mainly on the individual rather than on the relationship dynamics because (a) research is very scarce in this field; (b) sexual arousal is rather complex in its own right; and (c) most of the sexual dysfunctions to be labeled so need to be independent of context.

As an example of context (in)dependence, if a person is diagnosed with genito-pelvic pain/penetration disorder (GPPPD; DSM-5), problems with penetration are not specific to a woman's current partner but will have been present with other partners. In contrast, if a man cannot get "hard" with his partner but feels satisfied when he self-initiates sex or when he is with another person, then sexual arousal per se

should, of course, not be considered the main issue. Having said that, anecdotal clinical observations suggest that even where a person is diagnosed with GPPPD (considered as being context-independent), intense sexual arousal (perhaps precipitated by a different person or context) can attenuate the symptoms of the disorder.

### **Psychological Factors Involved in Low Sexual Arousal**

In addition to the relevance of context, problems with sexual arousal can present as a primary complaint or as secondary to other complaints. Disturbed sexual arousal per se has frequently been associated with dysfunctional attitudes toward sex (e.g., perceiving sex as a sin), negative thoughts (Carvalho, Veríssimo, & Nobre, 2013), fear or performance-related worries (e.g., Janssen et al., 2000), and distracted attention (Barlow, 1986; Hamilton & Meston, 2013). Also, negative affective states such as guilt and sadness were negatively correlated with sexual responding in both men and women (Carvalho et al., 2008; Nobre & Pinto-Gouveia, 2008).

Low sexual arousal also often occurs as a consequence or by-product of another primary problem or as a result of prior experiences. For instance, mental disorders such as depressive disorders are often accompanied by lack of arousal (e.g., Bartlik et al., 1999; Kalmbach, Kingsberg & Ciesla, 2014), which is a side effect of many antidepressant medications. Also, a chronically high level of stress (Hamilton & Meston, 2013), drug use, and various medical and physical conditions can have negative influences on sexual functioning. Lack of sexual arousal might also be the consequence of pre-existing problems with sexual desire or with a lack of desire for the current partner. Relationship issues in general (such as a lack of trust or worries about the strength of the relationship) can affect sexual arousal very negatively (e.g., Graham, Sanders, Milhausen, & McBride, 2004). Problems with sexual arousal

can also be caused by prior sexual problems. For instance, sexual arousal was negatively affected by concerns about the ability to attain or maintain an erection and anticipation of failure (failure anxiety) in men. In women, negative thoughts of sexual failure, disengagement, and sexual abuse negatively affected sexual arousal (Nobre & Pinto-Gouveia, 2008). As such, painful sexual experiences in women can motivate avoidance of sexual stimuli because the association of these stimuli has changed from pleasure to pain, anxiety, and disgust (Borg, de Jong, & Weijmar Schultz, 2010; Reissing, Binik, Khalifé, Cohen, & Amsel, 2004), and possibly to the creation of pain expectancies and catastrophic (negative) beliefs (Borg, de Jong, & Weijmar Schultz, 2011; Lykins, Meana, & Minimi, 2011; Payne, Binik, Amsel, & Khalifé, 2005).

Although the work mentioned previously clearly shows that many factors have been negatively associated or correlated with low sexual arousal, there is a scarcity of comprehensive psychological models that integrate these factors and explain how and why they might be related to problems with sexual arousal. What is more, many of the factors mentioned here are negatively related to general psychological well-being and are not specific to sexual arousal. Specifically, changes in affective symptoms (mood and anxiety) were directly related to sexual function in a sample of women (Kalmbach et al., 2014), leading the authors to suggest that these processes are the products of shared underlying mechanisms. While it is possible and even likely that such shared underlying mechanisms exist, a confounding of low sexual arousal with decreased psychological well-being in many studies may have hindered the effective search for arousal-specific factors. The only factors that were specific for low sexual arousal were sex-related negative cognitions, expectations, and dysfunctional attitudes, which often seem to be caused by prior negative sexual experiences. However, the results that demonstrate this are exclusively of a correlational nature, which limits the ability to determine their causal relevance for (low) sexual arousal. Moreover,

most of these studies investigated subjective self-reports of participants during or after sexual experiences, with little or no consideration of the subtle state factors that might nevertheless have strongly influenced sexual arousal.

### **The Inhibitory and Excitation Play: Disgust as a New Factor in Low Arousal**

Contemporary or dominant models of sexual behavior propose that sexual responses involve an interaction between sexual excitatory and sexual inhibitory processes (e.g., Bancroft and Janssen, 2000). From such a perspective, the generation of sexual responses may be compromised when sexual inhibition outbalances sexual excitation. We have recently argued that among factors that can inhibit sexual arousal or excitation in a sexual context, disgust may be a prominent candidate that feeds inhibitory tendencies (Borg, 2013; de Jong & Peters, 2009; de Jong et al., 2013).

Disgust is one of Ekman's universally recognized basic six emotions (Ekman, 1992) and is associated with certain behavioral tendencies related to avoidance and withdrawal (Davidson, Ekman, Saron, Senulis, & Friesen, 1990; Harlé, & Sanfey, 2010). So-called pathogen disgust is thought to have the evolutionary function of a self-protection system (Rozin, Haidt, & McCauley, 2008). By maintaining inhibitory tendencies, operating defensive reflexes, or actively motivating avoidance of disgust-evoking stimuli, disgust is thought to protect us from contamination by non-visible pathogens (e.g., other people's bodily fluids; Curtis, de Barra, & Aunger, 2011; Oaten, Stevenson, & Case, 2009). Indirect evidence of such a protective effect of disgust against diseases is that the disgust propensity was shown to vary as a function of vulnerability to disease. For instance, Fessler, Eng, and Navarrette (2005) found a temporary increase in disgust propensity during the first trimester of pregnancy, during which the risk of afflicting diseases is highest.

Another point that is important for the current context is that the body parts involved in

sexual activities (mouth, vagina, tip of the penis) are generally considered to be highly sensitive for contamination when on our own body. These same body parts on someone else seem to have high contamination potency. The bodily fluids emitted by others during sexual activity (e.g., saliva, sweat, or semen) are associated with a very high disgust propensity (Rozin & Fallon, 1987). Lastly, sexual contact involves a close proximity, which was shown to increase disgust (Rozin et al., 2008). As such, from the perspective of a disease avoidance model it makes sense to avoid sexual activities because of their potential for contamination.

Consequently, disgust and sexual arousal almost seem like opposing forces, representing opposing needs (the need to avoid contamination and disease versus the need for procreation and pleasure). These findings therefore raise the question how humans generally manage to perceive sex as arousing and rewarding. This question is especially applicable to women because for them sexual activity can involve several apertures, which increases their vulnerability for infections, and because women generally show a higher disgust propensity than men (Fessler, Arguello, Mekdara, & Macias, 2003; Haidt, McCauley, & Rozin, 1994). This indicates that disgust, or the relief of disgust, may be involved in and necessary for pleasurable sexual activities.

The link between sexual arousal and disgust was investigated and supported in a number of studies. For instance, a correlational study showed that both male and female participants who were more aroused reported a lower level of disgust after watching an erotic film than their unaroused counterparts (Koukounas & McCabe, 2001). Overall, these studies suggest that there is a link between disgust and arousal. However, although they were correctly executed methodologically, these studies were merely correlational in nature and did not reveal any direction or causality.

Two independent studies, therefore, tested this link experimentally and considered the following. Since both disease avoidance and

procreation (and pleasure) are of paramount evolutionary importance, there should be a mechanism that facilitates pleasurable and functional sexual experiences and still minimizes health risks. Hypothesizing that sexual arousal is such a mechanism, two studies tested the influence of sexual arousal on disgust. The hypotheses were that increasing sexual arousal would (a) decrease the level of disgust evoked by initially considered disgusting stimuli (Stevenson, Case, & Oaten, 2011), or (b) directly affect approach tendencies (which are inhibited by disgust) without affecting the level of disgust, or (c) both (Borg & de Jong, 2012).

The first hypothesis was tested by Stevenson et al. (2011) who induced sexual arousal in a group of male students and compared their level of disgust in reaction to disgust-inducing sex-related or non-sex-related stimuli with that of students who had watched a neutral film clip. Consistent with the assumption that sexual arousal might temporally reduce disgust, they found that the group of sexually aroused male students reported less subjective disgust in response to sex-related disgust elicitors than the unaroused group. Using female students, the second study replicated and extended Stevenson et al.'s (2011) findings (Borg & de Jong, 2012). This study again collected ratings of disgust in response to sex-related and non-sex-related disgust elicitors from sexually aroused students. Beyond that, the students were also asked to perform certain potentially disgust-inducing behavioral tasks that were, again, either of a sexual or of a non-sexual nature. Their ratings and willingness to perform the tasks were compared to those of two other groups of students: a group that watched a neutral film clip and another that watched an exciting film clip including extreme sports that was intended to induce non-specific (positive) arousal. The results clearly showed that the students in a sexually aroused state showed decreased disgust in response to sex-related pictures and that they completed the highest number of sex-related tasks. There was also a small trend for showing less disgust to non-sex-related pictures (Borg & de Jong, 2012).

The findings were quite relevant in that not only did the subjective appraisal of the level of disgust change with sexual arousal, but the actual behavioral approach tendencies were increased. This suggests that sexual arousal may not only counteract the subjective perception of disgust, but also transform some of the disgust-induced avoidant and inhibitory tendencies into more approach-oriented behavioral tendencies (see Figure 18.1). The effect of sexual arousal on behavior was not mediated by disgust, meaning that sexual arousal seems to affect both level of disgust and behavioral approach tendencies independently of each other. As mentioned before, we used a control condition by adding an arousal group in order to be able to demarcate effects of general levels of arousal from sex-specific arousal. Participants in the arousal group rated non-sex-related stimuli as similarly disgusting as the sexual arousal group, whereas the sexual arousal group rated it as less disgusting than the neutral group. This may indicate that arousal per se has an inherent disgust-decreasing effect and that sexual arousal has a specifically strong effect this way (Borg & de Jong, 2012). However, the non-sexual arousal condition did not have an effect on sexual disgust stimuli and on behavioral tendencies to fulfill sex- and non-sex-related tasks. These findings suggest that sexual arousal has the potency to overrule preconceived notions and disgust-maintained inhibitions. It is possible that sexual arousal induces approach tendencies toward certain sexual actions (and to experience pleasure from them) that would not have been considered in an unaroused state.

In line with the last argument, it was shown that male participants in a sexually aroused state were significantly more open toward several sexual activities and behaviors that evoked repulsion prior to the arousal (e.g., “having sex with someone who is extremely fat” or “getting sexually excited by contact with an animal”) than their unaroused counterparts (Ariely & Loewenstein, 2006). This indicates that sexual arousal may even reduce the prerequisites potential partners need to fulfill. The original

repulsion reflected by the male participants in this study is referred to as sexual disgust, which from an evolutionary perspective has the function of assisting in the selection of an appropriate sexual partner, one that has high intrinsic qualities and likely a valuable genetic pool (e.g., this intrinsic quality can be signified by an hourglass figure or a symmetrical face; Tybur, Lieberman, & Griskevicius, 2009).

Sexual disgust is also thought to protect us from engaging in intercourse with someone who is genetically too close to us (e.g., a sibling), or someone who is thought to have bad genes. But it is also thought that disgust protects us from overstepping certain moral borders, such as sexual activity with children. Simply imagining sexual acts with each of these categories typically elicits disgust. The findings indicate that sexual arousal might temporally reduce each of these facets of disgust. In a similar vein, sexual arousal was shown to increase risk taking (Ditto, Pizarro, Epstein, Jacobson, & MacDonald, 2006; Strong, Bancroft, Carnes, Davis, & Kennedy, 2005) and to impair decision making (Van den Bergh, Dewitte, & Warlop, 2008), further demonstrating that sexual arousal may undermine mechanisms that normally help people to avoid certain risky or possibly contaminating stimuli. Supporting the alleged reciprocal relationship between disgust and sexual arousal, there is also evidence that experimentally induced disgust lowers sexual arousal. That is, when sexually explicit images were primed by disgusting pictures, the sex-relevant pictures elicited less self-reported sexual arousal than the unprimed pictures (Andrews, Travis, Cholka, Cooper, & Bridges, 2015). The effect of disgust on arousal became larger following additional presentations, especially in women. Thus these findings support the view that disgust has an inhibitory effect on sexual arousal. This is particularly relevant in the current context, as problems associated with low sexual arousal may arise when disgust is elicited, thereby inhibiting the generation of sexual arousal.

Together, the available evidence paints a picture of sexual arousal and disgust balancing

each other and keeping each other at bay. In the context of the dual process model (Bancroft & Janssen, 2000) these findings seem to show that disgust is a strong inhibitory factor. However, it has to be considered that the tasks performed in the studies were limited to explicit notions and did not tax the more automatic processes, which are thought to play a large role in the context of sexual arousal. An exploration of such automatic processes may be relevant for further examination of sexual arousal and its inhibitors as well as its elicitors (e.g., see Gawronski & Bodenhausen, 2006).

### From Disgust to Desire

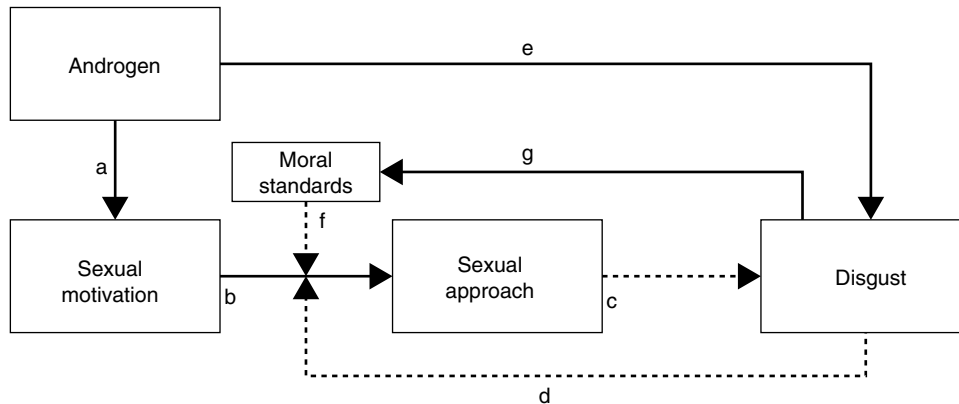
From what we have explained above, it can be seen that sex is a risk-taking act, at least from the perspective of the disease avoidance model. Other negative emotions such as fear, anxiety, and pain are more secondary to a specific or particular negative experience, whereas disgust may be seen as the default response that needs to be habituated before sexual arousal can flourish. Let us imagine perhaps the simplest sexual activity, French kissing. This activity will entail the sharing of saliva and penetration by another persons' tongue, with the capacity of more than 80 million bacteria in a single 10-second kiss transferred to the other person (Kort et al., 2014). It is difficult to conceive how this can elicit pain or fear, but it makes perfect sense that, in the absence of sexual interest, disgust or fear of contamination is experienced. Of course other sexual activities such as intercourse will have even higher risks of contamination, such as irreversible sexually transmitted viruses (Curtis, 2013; Kort et al., 2014). Besides, these sexual activities might also trigger other negative emotions such as anxiety or pain, based on anticipation or prior experiences.

So, if disgust is evolutionary relevant for survival, and the main sexual stimuli are strong disgust elicitors, it understandable that pubertal children (particularly) are generally repelled by these mentioned stimuli. This is especially so, when considering the high disgust potency of

stimuli such as saliva, and that hormonally driven sexual motivation in prepuberty is assumed to be absent. However, when sexual motivation increases (as a result of exposure or hormonal surge) excitation temporarily overrides the inhibitory forces driven by this protective mechanism, to promote the functional shift from disgust to desire.

By the age of 9–10 in girls and 10–12 in boys, the transition from childhood into adolescence is marked by the surge of hormones. The gonadal (sex) hormones, which are known to contribute to the typical physical and behavioral changes in puberty, are released (Peper & Dahl, 2013). This process leads to the onset of biologically triggered sexual motivation (gray stream in Figure 18.2), though increased androgen may also lead to the propensity for heightened disgust as a protective mechanism (black stream in Figure 18.2; Curtis, 2013). Considering that sex and disgust are two competing forces in functional sexual development, sexual motivation will override disgust (inhibition). Problems arise when disgust hinders the functional process of sexual development, disrupts sexual excitation, and eventually leads to sexual dysfunctions (Figure 18.2). According to Valerie Curtis, the disgust propensity heightens with increasing androgens (gray stream in Figure 18.2) as a compensatory mechanism for the increased risk of infections that is part and parcel of becoming sexually active (Curtis, 2013). However, in contrast to Curtis's hypothesis, we have recently argued that disgust may actually reduce instead of heighten in order to facilitate the approach to (disgusting) sex-related stimuli (sweat) when individuals become ready to have sex (Figure 18.2). Another possible pathway may be that androgens indirectly reduce disgust by stimulating sexual motivation or approach behavior (reward, actual contact, peer pressure) which in its turn inhibits disgust. According to this hypothesis, androgen levels *sexually motivate* the person to come into contact with disgusting stimuli. Because prolonged contact allows habituation to occur, engagement in sexual behaviors facilitates habituation to the





**Figure 18.2** Androgen and disgust responding. Solid arrows indicate excitation, broken arrows represent inhibition; arrow e may indicate excitation or inhibition. *Source:* Adapted from Jong 2013.

disgusting properties of sexual stimuli and/or behaviors.

To examine this hypothesized shift from disgust to desire, we recently conducted a small-scale preliminary cross-sectional study with 150 participants in Germany. This study measured the propensity for disgust-eliciting stimuli in multiple age cohorts (6 to 17 years of age). Preliminary findings indicate that disgust development is heightened during the age range 12–14 and drops again at the age range 15–17. This finding highlights the need to understand the mechanism behind this increase and subsequent drop in disgust, when risks of pathogen transmission (e.g., sexually transmitted bacteria and viruses) escalate further with the new opportunities that come with increasing age (Curtis, 2013). Research about this shift should be relevant for treatment interventions targeting sexual problems when either negative emotions are inhibiting excitation, and/or when excitation is not enough to override these inhibitions.

According to the same thinking, if this shift from disgust to desire does not take place or is delayed, perhaps as a result of strict moral standards, social restrictions, or culturally imposed rules (e.g., sex is sinful, or women should not touch themselves for pleasure), natural habituation may not occur, and the person

may enter a self-perpetuating cycle in which sexual disgust becomes a chronic symptom (Figure 18.1). This disgust might be what was captured when we investigated women with GPPPD (i.e., women who are unable to have intercourse [vaginismus] or who have pain with intercourse [dyspareunia]), compared to sexually asymptomatic women, the default disgust may never have been neutralized or the shift from disgust to desire did not occur (Borg et al., 2010; Borg et al., 2011).

In countries and cultures where sexual engagement is postponed till after marriage, there is a high prevalence of GPPPD (Dogana, 2009). If the desensitization or habituation of sexual disgust is postponed, it can consequently manifest itself as enhanced disgust, with all the associated implications.

Furthermore, individuals suffering from sexual problems involving low sexual arousal have indeed been characterized by high conservative moral standards and hold negative beliefs around sex (Borg et al., 2011; Nobre & Pinto-Gouveia, 2006; Ward & Ogden, 1994). Transgressions of sociomoral values are powerful elicitors of disgust (Rozin et al., 2008). Notably, the experience of disgust itself may further shape and strengthen people's moral values (Schnall, Haidt, Clore, & Jordan, 2008). Accordingly, feelings of disgust toward sexual

stimuli may further enhance the influence of already present restrictive moral standards and negative (sex) beliefs (e.g., masturbation is wrong, anal sex is a perverted activity, etc.). In this thinking, moral standards weaken the relationship between sexual motivation and the actual approach (Borg & de Jong, 2012). Therefore, if a sexual stimulus or cue is perceived as sinful or as a transgression against one's beliefs, and/or if indeed androgen heightens disgust in puberty, this can further emphasize the already existing moral standards that will further inhibit approach tendencies. In its turn, avoidance tendencies will act in a way to maintain sexual problems.

### Synthesis

The previous explorations of sexual arousal and the factors involved have led to a change in the conceptualization of sexual arousal: rather than regarding sexual arousal as an individual process, the combination of disgust and sexual arousal suggests an evolutionary mechanism directed at balancing two vital needs. It is thought that there are at least two motivational systems: an approach and a withdrawal system (Arnold, 1960; Davidson Jackson, & Kalin, 2000), whereby the former reacts to stimuli related to the survival of the species and the latter acts as a defense system that is triggered by threat. Therefore, humans are confronted with opposing forces and opposing needs. These are related to the need to procreate (and pleasure and/or reward) on the one hand, and the need to reduce the risk of contracting diseases and infections on the other hand. More specifically, disgust seems to reduce sexual arousal, whereas sexual arousal can temporarily reduce disgust and its withdrawal tendencies, and induce the functional changes that allow for pleasurable intercourse and decrease the risk of contracting a disease (Borg & de Jong, 2012). These findings therefore extend the evolutionary function of sexual arousal and, perhaps in contrast to the dual process model (Bancroft & Janssen, 2000), sexual arousal seems to be more than merely the

consequence of the balance of excitatory and inhibitory processes; rather, it seems to interact directly with disgust (see Figure 18.1). This interaction is not accounted for in the dual process model, although the authors do mention that each inhibitory factor of sexual arousal likely functions with an evolutionary purpose (e.g., inhibition may protect from detected threats; Janssen & Bancroft, 2007). However, they do not predict this direct interplay of sexual arousal with such an inhibitory factor.

Besides the focus on disgust as an inhibitory factor, the beginning of this chapter highlighted many factors that were shown to be negatively related to sexual arousal. However, these factors and the other negative emotions mentioned earlier seem to play a less direct and more circumstantial role than disgust in sexual arousal. The model of sexual arousal depicted above shows sexual arousal as involved in a constant balancing act with disgust. It seems that sexual stimuli can be responded to ambivalently, with both sexual arousal and disgust being evoked. Whether sexual arousal can outbalance disgust likely depends on the strength of the sexual stimuli, their disgust intensity, the disgust propensity of the individual, and the factors mentioned above (e.g., mood, stress, etc.). These factors probably exert an effect either by directly influencing and inhibiting sexual arousal, or by reinforcing disgust. It is plausible that a highly negative mood, anhedonia, or generally decreased psychological well-being might erect a barrier that filters out, changes, or decreases the processing of otherwise sexually arousing stimuli, the consequence of which might be that the levels of disgust are not reduced enough for sexual arousal to occur (Kalmbach et al., 2014). Alternatively, someone who is stressed might be so distracted during the sexual activity that they are not able to retain enough excitatory stimulation to reduce the levels of disgust (Hamilton & Meston, 2013). Furthermore, a person who has learned to associate sex with pain (e.g., as a past victim of sexual assault), and who experiences negative automatic thoughts and feelings of threat on confronting sexual stimuli, may not

receive enough positive stimulation for the excitatory processes to overcome the tendency for disgust (and other negative emotions such as anxiety may be experienced). The thoughts and threat appraisals may directly increase the disgust response. It has been argued that dysfunctional sexual attitudes (e.g., general sexual conservatism) can be equated with moral disgust, a category of disgust that is formed by the society we live in and that protects us from overstepping certain moral borders (Kelly, 2011; Tybur et al., 2009). As such, that dysfunctional sexual attitudes were negatively related to sexual functioning (Carvalho et al. 2013) may be indicative of higher intrinsic levels of sex-related disgust. However, the mediation of disgust in the relation of either of these factors to sexual arousal has not been investigated and still awaits further study.

## Empirically Supported Treatment Components

### Overview of Treatment for Low Sexual Arousal

Treatment for enhancing the sensitivity for sexual excitation usually requires a thorough understanding of the mechanisms underlying the presented problem. Thus, effective treatment requires addressing the underlying contextual problems (being able to express what pleases one, making use of lubrication, working on creating enough stimulation in one's sexual relationship by engaging in new experiences), as well as the medical (e.g., changing drug treatment that may have sexual side effects), psychological (exploring negative emotionality elicited by sexual stimuli), or psychiatric (optimizing treatment for depression) conditions and/or hormonal changes (e.g., androgen therapy to increase sexual incentive, and estrogen therapy to increase vaginal tone and elasticity). However, to address the main purpose of this chapter, we should return to Figure 18.1. This model can perhaps help us to have a better understanding

of possible leads for treatment and the features that can hinder a better outcome. Thus this section will center on interventions that either enhance the excitation forces or weaken the inhibitory forces. As Figure 18.1 shows, both sides of the mechanism work in synchrony, so, by working on weakening the inhibitions, we would also be enhancing the sensitivity to excitation (or sexual arousal), and vice versa.

### Sporadic Treatment Intervention for Problems of Low Sexual Arousal

The findings presented above lead to some considerations regarding possible treatment approaches for low sexual arousal. As shown in Figure 18.1, sexual dysfunctions are regarded as the consequence of either too little positive or adequate sexual stimulation, or too high levels of disgust. Traditional treatment approaches usually focus on increasing sexual stimulation or on removing assumed inhibitory factors (other than disgust). Sexual problems are regarded as being strongly related to interpersonal, psychosocial, and medical factors. As such, a first step in dealing with sexual problems would be to draw up a comprehensive medical and psychosocial history, biography, or anamnesis (Basson et al., 2004; Montorsi et al., 2010). This should include the current symptoms (biological, psychosocial, and sexual), the context in which the problems occur, and the onset thereof, but also past medical, psychological, and sexual problems. Importantly, the current sexual response is evaluated in great detail and the experienced level of distress is assessed.

A functional analysis is then conducted on the history, which contains certain hypotheses regarding causal and maintaining factors (Leiblum & Wiegel, 2002). Different treatment options are chosen on the basis of this functional analysis. If the sexual problems co-occur with or are thought to be secondary symptoms of another primary disorder, it is general practice to treat the primary complaint first rather than specifically targeting the sexual arousal disorder (Basson et al., 2004). For instance, if a mood or substance use disorder is present,

treatment is directed primarily at this rather than at the sexual problems they mediate. However, if the sexual problems are a major source of distress for the patient there is a selection of treatment options that can be used.

If, for instance, the analysis shows that the patient holds certain dysfunctional beliefs or sexual myths, psychoeducation can be a helpful tool. Myths that are often held include, for instance, the belief that it is abnormal not to always reach an orgasm or that good sex must be spontaneous. Psychoeducation aims to increase knowledge about sexual (dys)functions, to rectify unrealistic standards that might be held, and to normalize the problem (Leiblum & Wiegel, 2002). Another technique to challenge and correct such misconceptions is cognitive restructuring, which is an integral part of cognitive behavioral therapy (CBT; e.g., Rothbaum, Meadows, Resick, & Foy, 2000). This technique is often used to challenge strictly moral and negative attitudes about sexual activities and distracting thoughts during the latter. This intervention focuses on increasing the patient's ability to recognize unhelpful thoughts and to correct certain cognitive biases that might be at play, such as over-catastrophizing or all-or-nothing thinking. The goal is to strengthen positive fantasies and attitudes toward sex (Leiblum & Wiegel, 2002). In addition to their effects on misconceptions and negative attitudes, psychoeducation and cognitive restructuring were also found to decrease the experience of negative emotions, such as anxiety, shame, or guilt during sexual contact (Leiblum & Wiegel, 2002). However, additional interventions may be useful to further decrease negative emotional reactions to sexual stimuli. Desensitization is commonly used in this context, that is, exposure to erotic pictures and writings, as well as sensate focus exercises/non-demand touching exercises (Leiblum, 2010). The latter refers to a therapy for couples, in which they are asked to touch each other in a sensual manner while refraining from intercourse (Masters and Johnson, 1970). This is thought to increase the intimacy and sensual

pleasure while circumventing performance pressures and worries. Concerns about body image may also play a role in low sexual arousal, which is targeted with interventions of body image desensitization and cognitive restructuring (Leiblum, 2010).

Many interventions are also directed at the relationship in which the sexual problems emerge. In addition to sensate focus exercises, such couples' therapy can also include communication training, which aims to stimulate verbal communication between the sexual partners so that wishes, fantasies, preferences, and dislikes can be discussed in an open and comfortable manner (Bitzer & Brandenburg, 2009). If the problem is a shortcoming in sexual technique in either the patient or his/her partner, the use of instructional videos and other materials is not uncommon (Leiblum & Döring, 2002); this can be used in combination with open communication and non-demand sensual touching exercises. Another effect of the couples' therapy can be the disclosure of certain secrets kept by one or both of the partners that might have had an indirect negative influence on the intimacy between them (e.g., infidelity, sexual orientation, or undisclosed history of abuse). Expressing these secrets can go a long way toward influencing the course of the future relationship (Leiblum & Wiegel, 2002). Couples can also be assisted in incorporating sexual activities into their daily lives: this involves identifying conditions in which sexual pleasure is facilitated and planning sexual activities accordingly (e.g., time management training). In this vein, a recent study outlined the effect of group mindfulness-based therapy/non-judgmental present moment awareness for enhancing desire (Brotto & Basson, 2014). This training was combined with psychoeducation and cognitive therapy in a group setting (four sessions of 90 minutes each). Following treatment, it appeared that women were more accepting of their partner, which facilitated desire. Though this is not really targeted as a "relationship" intervention, it is of relevance because feelings for a partner was one of the strongest predictors of women's sexual desire

and response (Dennerstein, Guthrie, Hayes, DeRogatis, & Lehert, 2008).

Many of the interventions described so far were directed at removing obstacles thought to inhibit sexual arousal. There are, however, also interventions directed at enhancing arousal. For instance, couples might be recommended to make use of erotic materials. In some cases, more specific skills training is recommended, such as pelvic floor awareness or general body awareness exercises, sometimes including guided masturbation (Bitzer, & Brandenburg, 2009; Zamboni, & Crawford, 2003). These trainings are thought to increase the knowledge of one's own sexual body and of the bodily signals related to sexual arousal.

While there are several psychological interventions that are used regularly, the evidence of their effectiveness in controlled trials is still limited (Basson et al., 2004). In addition to psychological treatments, there are also more biomedically oriented approaches, such as attempting to increase the sensitivity to sexual incentives by influencing the sexual hormones. For example, the use of androgen patches was quite successful in some studies (e.g., Simon et al., 2005). However, there is a growing understanding in the scientific community that medical interventions should be applied in combination with psychological interventions in order to counteract sexual problems in a lasting way (Basson et al., 2004).

### **Factors Hindering Current Treatment Options**

As mentioned earlier, findings have shown that disgust may play a role in reducing sexual arousal. If so, perhaps the effectiveness of some of the approaches described above may be the result of their indirect influence on disgust. For instance, cognitive restructuring and psychoeducation, which are used to challenge strict moral beliefs, for example, may facilitate sexual arousal by decreasing the level of moral disgust in an individual (e.g., Borg et al., 2011). Also, the positive effects of communication and

non-demand touching therapy may partly be due to increased levels of intimacy that might decrease the levels of disgust associated with the partner. Recent research suggests an association between intimacy and disgust in line with this assumption (Bužeková & Išová, 2010). In a similar vein, the effect of reduced negative emotions evoked by sexual stimuli following exposure to them may also be mediated by effects of the exposure on levels of disgust (e.g., Olatunji, Huijding, de Jong, & Smits, 2011). As of yet, neither of these links has been subject to direct scrutiny, nor has there been any investigation of interventions in sexual arousal that specifically target disgust. This chapter discusses some approaches involving disgust that may be worth testing or considering.

## **Appraisal of Treatment Interventions and Application**

Involving disgust in the functional analyses of sexual problems may be especially important because disgust does not only influence our feelings (which on their own are likely to interfere with sexual arousal), but also promotes avoidance and escape behavior (Oaten et al., 2009). The latter are very likely to maintain problems with sexual arousal because they prevent every opportunity for and contact with sexual arousal.

A possible disgust-oriented treatment could attempt to reduce the level of disgust that is experienced in reaction to sexual stimuli. This might be done using prolonged exposure to disgust-evoking stimuli. An intake interview is needed to identify factors that trigger disgust in a sexual setting. The exposure exercises are adapted accordingly. Exposure therapy is part of the standard CBT repertoire that is usually applied to fear-related disorders (e.g., phobias, panic disorder, obsessive–compulsive disorder). Similar to fear exposures, disgust exposures would consist of different stages of disgust. For this, the patient identifies certain stimuli and behaviors (sex-related and non-sex-related) that

evoke disgust, and sorts them into a disgust hierarchy. Usually, the exposures start from the bottom of the hierarchy, with the least disgusting stimulus or action (Ter Kuile et al., 2009). The exposures then take place either during the psychotherapeutic sessions or, preferably, at home in the form of homework. A goal of these exercises or therapy is to reduce these feelings of aversion to particular stimuli and their disgust reaction to it via habituation (de Jong, Vorage, & van den Hout, 2000; Mason & Richardson, 2012).

Recently, the role of disgust in several psychopathologies, such as certain phobias and washing compulsions, has received increasing support and given rise to exposure interventions targeting disgust (e.g., Olatunji et al., 2011). Unfortunately, a prevalent finding has been that disgust is much harder to “unlearn” than fear (e.g., Olatunji, Wolitzky-Taylor, Willems, Lohr, & Armstrong, 2009). A possible explanation for this finding is that disgust is rather unspecific since one cannot know for certain where contamination might lurk (e.g., as bacteria can be present, even if invisible to the naked eye, the evolved disgust system seems to be highly conservative and reflects a better-safe-than-sorry heuristic). Thus, because a person cannot determine the contamination risk exactly, he/she may deem it favorable from an evolutionary perspective to never completely let down his/her guard (de Jong, 2013). This aggravates the task of presenting situations that disprove the individual’s automatic disgust associations and may counteract complete habituations. Nevertheless, prolonged exposure to disgusting stimuli does seem to be the most efficient manner to reduce their impact (e.g., Meunier & Tolin, 2008). Exposure tasks should be designed in such a way that they provide safety information. Prolonged physical contact seems, therefore, to be the most critical component. But just being exposed to disgusting materials will not help much (Borg, Bosman, Engelhard, Olatunji, & de Jong, 2016). In this context, it is especially important to reduce avoidance and safety behaviors, which in the long run maintain the disgusted reactions to

the stimuli. The latter refer to either completely avoiding all sexual stimuli or to only entering sexual situations with certain items, stimuli, or behaviors that signify safety and temporarily reduce the disgust (e.g., using fabrics to avoid contact with bodily fluids during sexual activities). Although such behavior might momentarily decrease the levels of disgust, these safety behaviors preclude prolonged direct physical contact and thus hinder “real” exposure and habituation (Borg et al., 2011; Frank, Noyon, Höfling, & Heidenreich, 2010).

Another possibility in targeting the disgust response to sexual stimuli may be conceptual reorientation (Rozin & Fallon, 1987). This refers to a cognitive switch in the conceptualization and understanding of objects previously perceived as disgusting. Thus, the focus is placed not on why a stimulus is not disgusting but more on what the stimulus is (Mason & Richardson, 2012). In a sexual context, such a switch might occur when an individual who is disgusted by bodily fluids and/or body parts at the core of sexual activities (e.g., vaginal fluids) is informed of the important role this lubrication plays in protecting her and making the intercourse comfortable (de Jong, van Overveld, & Borg, 2013). Such reorientations could be performed using homework assignments. Furthermore, imagery restructuring can also be used in decreasing or counteracting the disgust properties of specific stimuli and disgust-driven inhibition or avoidance. This cognitive strategy can be aimed at targeting mental images of particular sexual stimuli (e.g., rethinking the vagina not as a disgusting piece of extra skin but as a flower bud). Finally, addressing one’s ability to cope with the feeling of aversion may be a good pathway to decreasing disgust and aversion. In the context of this chapter, this strategy can be applied by encouraging the client to come into contact with her/his least aversive stimuli (e.g., semen, vaginal fluid) to test out his/her reactions, with the aimed of decreasing the dysfunctional catastrophic concerns of coping with contamination. Similarly, as has been done with fear in panic disorders, Mason and Richardson

(2012) suggested that eliciting comparable physiological feelings to these experienced when confronted with a disgusting stimulus can help the individual to be more at ease with feeling disgusted (disgust sensitivity).

We have suggested some treatments of sexual arousal that might be used to target disgust more directly. This is not to say that such treatments should replace the ones described earlier, but rather that they might complement them and eventually increase their effectiveness in treating low sexual arousal and related disorders. However, empirical research and clinical trials are needed in order to evaluate these ideas.

## Conclusion

Innumerable physiological and psychological processes affect human sexual arousal. Not only does the context of a sexual experience shape how sexual stimuli and stimulation are received, but the experiences of that day, that month, and the whole lifetime also shape an individual's associations and reactions to such stimuli. This chapter has identified disgust as a potentially important counteragent to sexual arousal. Levels of disgust may either directly influence sexual arousal or mediate the relationship of other psychological processes to sexual arousal in a negative fashion. In their reciprocal relationship, arousal is thought to be able to reduce disgust temporarily. This chapter sheds light on the role of disgust as an obvious but neglected factor in inhibiting sexual arousal. We explored various treatment interventions that should at least be considered when dealing with this transdiagnostic factor (see also Borg, de Jong, & Elgersma, 2014).

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