Chapter 9
The Realm of Disgust in Sexual Behaviour

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The Goal of Pleasure and Reproduction Versus Remaining Disease and Contagion Free

Sex and sexual behaviour are a core part of life; besides reproduction, sex offers opportunities for pleasure and can be beneficial for bonding, intimacy and for many facets of one's life. However, along with these desirable features, sex and sexual behaviour can also have the clear down side of providing ample opportunities for contracting infectious diseases. To elaborate on this high risk of contagion, let us consider one of the simplest sexual activities, French kissing. This activity entails the sharing of saliva, with the capacity of more than 80 million bacteria in a single 10-s kiss transferred to the other person (Kort et al. 2014). Other sexual activities, such as intercourse, and/or coming into physical contact with the ejaculate and vaginal fluids, may similarly pose a high risk of contamination (Curtis 2013; Kort et al. 2014). Thus, the inherent contagious nature of sexual behaviours and sexual (by)-products may help explain why sexual stimuli, may also be generally considered as potent disgust elicitors (Rozin et al. 1995).

Disgust is thought to serve the evolutionary function of self-protection (Rozin et al. 2008) and disease avoidance (Oaten et al. 2009; see also Bradshaw and Gassen, Chap. 3, this volume). By the expressed disgust-driven inhibitory tendencies, operating via defensive reflexes, or by actively motivating avoidance (or withdrawal) of disgust-evoking stimuli, disgust is thought to protect us from contamination by non-visible pathogens (Curtis et al. 2011; Oaten et al. 2009). In line with the protective function of disgust, it has been shown that disgust propensity varies as a function of vulnerability to disease. For instance, Fessler et al. (2005) found a temporary

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increase in disgust propensity during the first trimester of pregnancy, during which the risk of afflicting diseases is highest. Clearly, disgust-induced avoidance of sexual stimuli may be helpful to reduce contamination risks, yet it seems incompatible with sexual pleasure and the functional goal of procreation. This raises the question of how the conflict between the opposing goals of disease avoidance and procreation can be resolved. How do people generally succeed in having pleasurable sex in the face of the disgust eliciting properties of the stimuli inherently involved in sexual behaviours?

The Effect of Sexual Arousal on Disgust and Its Characteristic Avoidance

Considering that both disease avoidance and procreation are of paramount evolutionary importance, there should be a mechanism that facilitates pleasurable and functional sexual experiences. One hypothesis that has been put forward is that sexual arousal may temporarily reduce feelings of disgust; thus, to the extent that sexual stimuli elicit arousal, this may counteract or neutralise the disgust eliciting properties of sex (Koukounas and McCabe 2001), thereby facilitating sexual approach (see also Fig. 9.1). Consistent with the assumption that sexual arousal might temporally reduce disgust, sexually aroused male students were found to report less subjective disgust in response to sex-related disgust elicitors than unaroused participants (Stevenson et al. 2011). A follow up study replicated and extended this pioneering work in female students (Borg and de Jong 2012). Again, experimentally heightened sexual arousal decreased disgust in response to sex-related disgust elicitors and reduced disgust-induced avoidance (Borg and de Jong 2012). Thus, sexual arousal not only reduced subjective appraisals but also behavioural avoidance of (sexual) disgust elicitors. In other words, it appears that sexual arousal may not only counteract the subjective perception of disgust but might also transform the disgust-induced avoidant and inhibitory tendencies into increased tendencies- and willingness to approach.

These findings suggest that sexual arousal has the power to override disgust-driven inhibitions/avoidance. It is thus possible that sexual arousal induces approach tendencies towards certain sexual stimuli and behaviours that would be inhibited in a non-sexually aroused state. In line with this argument, in a within-subjects study design, it has been shown that male participants ($N = 24$) in a sexually aroused state were significantly more open towards several sexual activities and behaviours that evoked repulsion in the absence of experimentally induced sexual arousal (e.g., “have sex with someone who is extremely fat”, or “getting sexually excited by contact with an animal”; Ariely and Loewenstein 2006). This indicates that sexual arousal might also reduce the prerequisites that potential sex mates need to fulfil for sexual appeal.

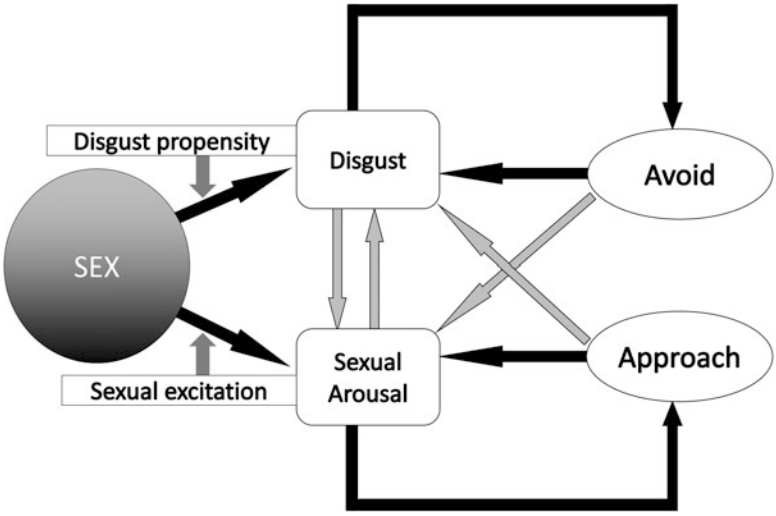

Fig. 9.1 Giving in to arousal or staying stuck in disgust? Disgust-based mechanisms in sex and sexual dysfunction. Model adapted from de Jong et al. (2013). Black arrows indicate excitation, whereas grey arrows refer to inhibition. The model illustrates how sexual arousal and sexual disgust are interrelated and jointly affect sexual behaviour resulting in either sexual avoidance, when disgust dominates, or sexual approach, when arousal outweighs disgust. Some sex-related stimuli are assumed to be inherently disgusting due to their associated contamination risk. Other sex stimuli, that become apparent somewhere around the process of puberty, are associated with sexual readiness (and a good fitness/healthy status). The latter sex stimuli have the potential to trigger sexual arousal that are expected to override disgust elicited by concurrently available sex stimuli that are somehow associated with contamination threat. Individual differences in trait disgust propensity will moderate the strength of the sex-disgust relationship, whereas individual differences in trait sexual excitation/arousability will moderate the relationship between sex and sexual arousal

The repulsion reported by the male participants in the unaroused condition is referred to as "sexual disgust", which, from an evolutionary perspective, has the function of assisting in the selection of an appropriate sexual partner, and to avoid sex partners of low intrinsic qualities and poor genetic make-up (Tybur et al. 2009; see also Tybur, Chap. 6, this volume). Sexual disgust is also thought to protect us from engaging in intercourse with someone that is genetically too close to us (e.g., father, mother, sister, or brother). Put simply, imagining sexual acts with each of these categories typically elicits disgust, and disgust promotes rejection and avoidance (Tybur et al. 2009). Thus, in combination, the available findings indicate that sexual arousal might temporally reduce both pathogen (or core) and sexual disgust.

The Weakening Influence of Disgust on Sexual Arousal

Consistent with the model depicted in Fig. 9.1, recent work indicates that the obstructive relationship between sex and disgust is bidirectional, meaning that not

only sexual arousal reduces disgust, but induced disgust may also weaken sexual arousal (e.g., Borg et al. 2019b). It has, for example, been shown that sexually explicit images elicited less self-reported sexual arousal when primed by disgusting pictures (Andrews et al. 2015). Following this idea, a recent experimental study showed that sexual arousal elicited by an erotic movie could be weakened by prior exposure to an aversive, disgusting odour (Borg et al. 2019b). The odour (associated with rotten food, rotten eggs, and tetrahydrothiophene - the odorant added to cooking gas) resulted in a decrease of both subjective and genital sexual arousal compared to the participants in the odourless control condition. These two studies support the view that disgust has an inhibitory effect on sexual arousal. Together, the available evidence suggests that sexual arousal and disgust have a mutually inhibiting relationship, however, as yet it is unclear what exactly the underlying mechanism of this bidirectional relationship is.

The Paradox

The available evidence seems to indicate that prior to the surge in testosterones in prepubertal boys and girls; these are typically repelled by intimate sexual behaviours such as French kissing. However, in spite of the disgust eliciting properties of sex and sexual behaviours, yet consistent with the function of procreation and sexual pleasure, at some stage most people generally become interested and get involved in intimate and sexual physical contact. The key to solving this paradox can be found in the capacity to become sexually aroused around the age that children become physically ready for reproduction. Probably due to the surge in testosterones in early adolescence, children may at that time acquire sexual approach motivation, together with sensitivity for sexual cues indicative of high mating value (e.g., breasts, blushed skin, particular body shapes, and body postures). The emergence of sexual cues may accentuate the sexual appeal and elicit sexual arousal at the time proximate to the process of puberty due to the surge in the gonadal hormones (Borg et al. 2019a; Peper and Dahl 2013). The gonadal hormones, which are known to contribute to the typical physical and behavioural changes in puberty, only start to be released by the age of 9–10 years in girls and 10–12 years in boys (Peper and Dahl 2013). Surrounding this age, these sex-related stimuli signalling a healthy status and reproduction fitness, may then become motivationally salient.

This process of transition from childhood into adolescence leads to the onset of biologically triggered sexual motivation. When sexual interest and sexual motivation commence, relevant sexual cues can elicit sexual excitation. In turn, this sexual excitation may (temporarily) reduce the inhibitory forces and avoidance behaviour that may at least partly be driven by the default disgust response towards sexual stimuli and behaviours that may signal contamination risk (Borg et al. 2019a; Koukounas and McCabe 2001).

It has been argued that testosterones impact the ability to become sexually aroused, and on the willingness to approach stimuli previously considered disgusting or avoided. In the meantime, testosterones may also impact on people's general

disgust propensity as a protective and compensatory mechanism for the increased risks to infections that comes as part and parcel with becoming autonomous and sexually active (Curtis 2013). In line with this notion, two cross-sectional studies (samples merged, $N = 248$, 6–17 years, 137 female students) using scenario-based measurements showed that general disgust propensity was overall higher in early adolescence (12–14 years) than in pre-adolescence (9–11 years; Borg et al. 2019a). Although this finding is consistent with the view that the heightened level of testosterones in early adolescence might be the motor behind the heightened general disgust propensity in this age group, it should be acknowledged that testosterone levels were not assessed in this study.

Consistent with the view that the ability to get sexually aroused may counteract the default sex-disgust response, it was found that disgust propensity towards sex-relevant disgust elicitors declined from pre-adolescence to early and middle adolescence (Borg et al. 2019a). In line with the view that this would serve the functional goal of procreation and sexual pleasure, such decline was restricted to contexts where peers and non-family members were the source of the sex-relevant disgust elicitors. Coherent with the view that sexual disgust might help prevent sexual approach of individuals with high genetic similarity (Tybur et al. 2009; see also Tybur, Chap. 6, this volume), disgust propensity increased from pre- to middle adolescence when parents were the primary source of the sex-relevant disgust elicitors (Borg et al. 2019a). The reduced disgust-eliciting properties of sexual behaviours may lower the threshold for adolescents to become involved in sexual behaviours. In turn, this weakened threshold may further contribute to a reduction of the disgust-eliciting properties of sexual stimuli that are involved in sex by habituation, thereby facilitating a healthy and typical sexual development. A recent online cross-sectional study ($N = 240$, 116 males, 9–17 years) provided further support for this idea. In this study we recorded the responses of youths towards 20 pictures (including inherently disgusting and sex-related stimuli) and six sexual behaviour scenarios (previously used in the study of Borg et al. 2019a), presented on visual analogue scales for the dimensions of liking and disgust. Preliminary data suggest that the pattern of findings of this online study is very close to the first two studies conducted in a classroom context (Oosterwijk et al. 2020). Self-reported disgust towards sex-related stimuli and behaviours (e.g., kissing) again followed a linear age trend, with sex-related disgust decreasing from the pre-adolescence group to the middle adolescence group.

An important next step would be to follow up these cross-sectional studies with a longitudinal approach. Longitudinal studies with repeated self-reported assessments of the disgust response towards sexual behaviours, together with repeated assessments of concrete sexual approach behaviours, are necessary to examine whether the current findings provide an adequate representation of people's actual developmental trajectories. Further, such studies may help to arrive at concrete conclusions in explaining the overall decline of (sex-relevant and sex-irrelevant) disgust from early to middle adolescence.

Besides assessing the disgust eliciting properties of particular sexual behaviours and sex stimuli that may signal contamination risk, it would also be important to

concurrently assess the sexual arousing properties of stimuli that are proposed to be relevant for sexual appeal (e.g., body features such as breasts, and specific body postures). Such information would help determine what factors are critically involved in sexual approach and whether the decline in disgust eliciting properties comes as a result of the heightened arousing properties of the stimuli that are relevant for sexual appeal. Additionally, it would be relevant to know the extent to which involvement in sexual behaviour contributes to a further decline in sexual disgust, from one sexual encounter to the next, and/or from one partner to a new partner. Finally, it would be helpful to test whether changes in arousal/disgust/sexual approach can be mapped on to the surge in testosterone during early adolescence.

If indeed testosterone levels play a crucial role in the shift from disgust-driven avoidance to sexual approach, it would be useful to test whether blocked testosterones have an intensifying effect on the disgust properties of sex and non sex-related disgusting stimuli and whether any shifts in disgust are translated into actual avoidance behaviours. The treatment of patients that are diagnosed with prostate cancer, offers the opportunity to study this relationship in a naturalistic framework. These patients are typically subjected to testosterone blockers as part of Androgen Deprivation Therapy (ADT), which leads to chemical castration. This type of treatment follows a typical trajectory. Patients begin with normal testosterone levels, however, following administration of ADT treatment, testosterone peaks at 3 days and then drops to castration levels 4 weeks later. Thus, this group of patients offers the opportunity to study the impact of heightened and lowered testosterones on sexual disgust within participants. To test whether avoidance is indeed intensified in the context of low testosterone, automatic approach and avoidance tendencies may be measured in an Approach Avoidance Task (AAT) in response to stimuli that are typically considered as sexually appealing and sex stimuli that may signal contamination risk (Hinzmann et al. 2019). Such an approach has the potential to help in understanding the impact of testosterones on the disgust properties of some sexual stimuli and to inform patients and their partners about what to expect following ADT.

The Evolution of the Disgust-Evoking Properties of Some Sexual Stimuli

As alluded to earlier in this chapter, sexual behaviour entails two categories of stimuli; those that promote reproductive health and signal sexual appeal (e.g., breasts) and stimuli that signal contamination thereby supporting the function of disease avoidance (e.g., saliva). Besides, some stimuli might fall in between these two categories (e.g., lips). Based on this categorisation, some specific sex stimuli are in general likely to maintain their inherently disgusting status, whereas other sex stimuli are likely to attract sexual appeal and trigger sexual excitation. Furthermore, sex stimuli may change their conditioned status either to a positive one following a

positive sexual experience/ pleasure/exposure, or to a negative/aversive one, after a negative sexual experience, or because sex/specific sexual behaviour occurred in the absence of sexual excitation.

Thus far, research on the relationship between developmental stage and the transition from sexual disgust to sexual desire (e.g., Borg et al. 2019a; Oosterwijk et al. 2020) has focused on potential changes in adolescents' disgust responses towards sex related stimuli and behaviours that may signal contamination risks (Curtis 2013). However, these studies have not focused on stimuli that may acquire sexual appeal. It thus remains to be tested how the arousal-eliciting properties of particular stimuli develop, and which stimuli are exactly involved/most critical in this acquisition. In addition, it would be important to examine how the change in sexual appeal of sex-relevant stimuli relates to the change in sexual disgust, as well as how these processes relate to and contribute to the rise of actual sexual behaviours.

To the extent that adolescents get involved in sexual approach behaviour, habituation of disgust is expected given that prolonged physical contact with disgusting stimuli is a potent way to reduce the disgust eliciting properties of otherwise initially disgusting stimuli (de Jong 2013; Rozin and Fallon 1987). Repeated exposure to sex-relevant disgust elicitors may even result in a more permanent reduction of disgust, thereby lowering the threshold for sexual approach. Repeated assessment of both sexual behaviour and the disgust eliciting status of particular sex-relevant stimuli would allow for the assessment of whether prolonged contact with such stimuli would indeed be followed by reduced disgust. Repeated exposure with the same partner would eventually also result in a pattern of equalisation of the bacteria thereby reducing contamination threat. Therefore, the decline in disgust eliciting properties of the sex-related stimuli will probably be most pronounced when repeated exposure occurs with the same sex-partner. Such a pattern would also be in line with the more general phenomenon that the disgust eliciting properties of stimuli highly depend on the stimulus' source; using a tooth brush of your sibling is typically less disgusting than using a tooth brush of an unknown person (Borg et al. 2019a; Peng et al. 2013).

It would be interesting and helpful to combine the responses to specific sex stimuli that are selected based on their contamination potential, with the testing of the appealing properties of non-contamination signal type (of gender specific) sex stimuli (such as breasts). This would allow identification of where an increase in attraction may promote sexual arousal and excitation and examination into how the change in sexual appeal relates to the disgust evoking properties of contamination-signalling sex stimuli. Perhaps it would be possible to identify trajectories that are involved in straightforward sexual development compared with trajectories that may relate to sexual problems and dysfunctions. Insight into such trajectories together with individual difference variables that may set people at risk for unfavourable trajectories might improve insights into factors involved in a healthy vs. more problematic sexual development. In addition, it may provide clues to improve current available treatment options for sexual dysfunctions.

Applications: Disgust Based Interventions and Gaps for Future Research

Involving disgust in the functional analyses of sexual problems and in promoting pleasurable sex might be especially important because disgust does not only influence the way we feel, but, as already discussed in this chapter, characteristically promotes avoidance and escape behaviour (Oaten et al. 2009). In light of what we have discussed earlier, the latter are very likely to weaken sexual pleasure, because every opportunity for contact with sexual stimuli is prevented. Consequently, this prevention of contact with sexual stimuli eliminates any possibility to focus and elaborate on, such stimuli for appraising it as sexually stimulating.

In the last decade, the role of disgust in several psychopathologies, has received increasing support (see Davey, Chap. 11, this volume), igniting several exposure-focussed interventions targeting disgust. Unfortunately, a prevalent finding has been that disgust is hard to unlearn (Bosman et al. 2016; see also Reynolds and Askew, Chap. 5, this volume). A possible explanation is that it is relatively difficult to disprove the contaminating properties of the stimuli in question, because the threat concerns pathogenic stimuli that cannot be directly detected by our senses. This might have geared the disease avoidance system to being overly conservative (de Jong and Borg 2019). This may help explain why exposure to stimuli that have been in contact with disgust elicitors are relatively ineffective in reducing people's avoidance to these stimuli (see e.g., Tolin et al. 2004). Furthermore, it may also help to explain why exposure is relatively ineffective in reducing disgust-induced avoidance of stimuli that previously acquired predictive value for disgusting outcomes (Borg et al. 2015).

Taking all of the above limitations into consideration, for over a decade it has nevertheless been acknowledged that prolonged exposure to inherently disgusting stimuli seems to be the most efficient manner to reduce their disgust-eliciting status (e.g., Meunier and Tolin 2009). Exposure tasks should be designed in such a way that they provide safety information and reduce the signal value of the target stimuli as a sign of contamination threat; prolonged physical contact seems therefore the most critical component (Borg et al. 2015; Bosman et al. 2016). In this context, it is especially important to reduce avoidance and safety behaviours, which in the long run maintain the associated disgust reactions to the stimuli. Research in the context of fear conditioning has shown that safety behaviours undermine the efficacy of extinction procedures to reduce learned fear responses (Lovibond et al. 2009), and it seems reasonable to assume that safety behaviours in the context of exposure to disgust eliciting stimuli will similarly undermine the efficacy of exposure to reduce disgust.

Safety behaviour in this context can be expressed as either completely avoiding all sexual stimuli or only participating in sexual situations with certain items, stimuli, or with behaviours that signify safety and temporarily reduce disgust (e.g., using fabrics to avoid contact with bodily fluids during sexual activities). Although such behaviour might momentarily decrease participants' levels of disgust, these safety

behaviours preclude prolonged direct physical contact and thus hinder the effectiveness of exposure in the long-term (Borg et al. 2011, 2020).

To investigate further how to optimally reduce (sexual) disgust, we designed a lab model of sexual disgust (Pawlowska et al. 2020). Similar to the traditional lab model of phobic fear, we used a classical conditioning procedure to facilitate acquisition/learning of disgust associations towards initially sexually arousing stimuli. During the acquisition stage, erotic films served as the Conditioned Stimuli (CS+ and CS−), where the CS+ film was repeatedly paired with a disgust film (Unconditioned Stimulus, US), and the CS− was not. Supporting the validity of this lab model of sexual disgust learning, the CS+ was rated as significantly more disgusting, less sexually arousing, and less pleasant than the CS−. Following this differential disgust conditioning procedure, the CS+ also elicited lower genital arousal than the CS− as indexed by vaginal pulse amplitude (VPA). Using this lab model, we recently tested the impact of mere exposure versus counterconditioning (in which the CS+ was paired with stimuli of high positive valence including pictures of romantic couples, palatable food, puppies, babies, and young animals) on acquired sexual disgust (Pawlowska et al. 2020). Both CS− only exposure (extinction) and the counterconditioning procedure were effective in eliminating the conditioning-induced differential physiological responsivity elicited by the CS+ and CS− as indexed by VPA. This appeared however not to be due to an increase in physiological arousal elicited by the CS+ from post-acquisition to extinction, but seems to be due to a general decline of the VPA to the erotic clips that already became evident during acquisition. This might have reduced the sensitivity of the VPA as a measure to detect more subtle differences between the CS+ and CS- over the course of the experiment.

In line with this, sexual arousal as indexed by a self-report measure showed a slightly different pattern in response to the extinction/counterconditioning procedures. Although both procedures were effective in reducing the acquired difference in subjective sexual arousal elicited by the CS+ versus the CS−, post extinction/counterconditioning the CS+ remained less sexual arousing than the CS−. A similar pattern was evident for the self-reported feelings of disgust. Although the acquired disgusting properties of the CS+ again reduced following the extinction and counterconditioning procedure, the CS+ remained more disgusting than the CS− (Pawlowska et al. 2020). The failure to fully eliminate the acquired disgust to the CS+ was paralleled with a failure to fully restore the sexually arousing properties of the CS+, which is consistent with the view that feelings of disgust may counterforce the generation of sexual arousal (as also proposed in the model depicted in Fig. 9.1).

In addition, the failure of both the CS-only extinction and the counterconditioning procedure to fully eliminate the acquired disgusting properties of the erotic clip that was used as the CS+ is consistent with previous findings indicating that disgust is relatively resistant to extinction procedures (e.g., Bosman et al. 2016). The findings of Pawlowska et al. (2020) also point to the relevance of coming up with fresh candidate strategies to target sexual disgust next to exposure and counterconditioning, which can then be tested within the context of this lab model (Pawlowska et al. 2020).

One possible candidate approach to target sexual disgust might be conceptual reorientation (Rozin and Fallon 1987). This refers to a "cognitive switch" in the conceptualisation and understanding of objects in a way that they no longer elicit disgust, by changing their core appraisal into something that is pleasurable or healthy and functional. For example, conceptual reorientation was used for a woman who indicated that she felt disgusted by "this slimy stuff" in her vagina by explaining that, in the absence of lubrication, a penis would feel like sandpaper. The reorientation of vaginal lubrication from being a highly aversive (bad-smelling and bad-tasting) fluid to a very helpful and positively valanced supporting substance appeared quite successful in modifying the originally dominant disgust appraisals and in reducing sexual avoidance (for detailed examples see de Jong et al. 2010). Reframing and challenging techniques from cognitive behavioural therapy may generally be helpful in changing relevant sex stimuli or behaviours from a disgust frame to promote pleasurable/rewarding or functional interpretations of these stimuli.

Such interventions can also be included within an emotional regulation framework. Using emotional regulation techniques, we tested whether a sexual arousal up-regulation strategy (the instruction to let one's emotion roll whilst watching an erotic movie) might effectively enhance feelings of sexual arousal and decrease feelings of disgust in response to sexual stimuli (van Overveld and Borg 2015). Indeed, brief sexual arousal up-regulation training appeared helpful in enhancing sexual arousal. However, this increase in sexual arousal was not paralleled with a decrease in disgust (van Overveld and Borg 2015). It needs to be said, however, that this study was conducted with sexually asymptomatic individuals who showed very weak disgust when exposed to the erotic movie to begin with.

In a follow up study, we successfully replicated the finding that up-regulation of sexual arousal could be successfully applied to increase arousal when exposed to an erotic video (Pawlowska et al. 2021; study 1). However, again, this strategy appeared ineffective in reducing feelings of disgust. Thus at least in the context of women without sexual problems and limited feelings of disgust when exposed to erotic materials, we failed to find evidence for successful sexual arousal upregulation to concurrently reduce feelings of disgust. This follow up study did however find some evidence for the inhibitory influence of disgust on the generation of sexual arousal. That is, it was found that the arousal up-regulation appeared ineffective in increasing sexual arousal when prior to the presentation of the erotic clip, the contaminating properties of sex were primed. Thus, making the disgust-relevant properties of sex more salient interfered with the subsequent efficacy of arousal up-regulation instructions. Together this implies not only that arousal up-regulation is not effective in reducing feelings of disgust, but it also implies that such up-regulation interventions might not be very helpful in increasing sexual arousal when sexual arousal problems are due to relatively strong pre-existing feelings of disgust. These cases suggest instead that the disgust eliciting properties of sexual stimuli should be reduced first, before aiming to increase sexual arousal.

We therefore also tested if disgust down-regulation strategies might perhaps be more effective than sexual arousal up-regulating strategies to reduce feelings of disgust. Findings indicated that indeed an emotion regulation strategy designed to

reduce disgust was effective in reducing feelings of disgust when exposed to an erotic video (Pawlowska et al. 2021; study 2). However, this study only included asymptomatic participants and thus it remains to be tested whether such an intervention would also be effective in reducing disgust in individuals with sexual problems related to sexual disgust. As an important next step, it is relevant to test these (or similar) interventions in symptomatic samples to explore their clinical relevance. Further, it needs to be mentioned, that reducing or even completely eliminating disgust may not be sufficient to lead to pleasurable sex. Such a strategy may just take away one barrier to sexual excitation; pleasurable experiences and sufficient stimulation may still be required for sexual enjoyment.

Weakening Sexual Approach

The interventions mentioned up until now are mainly focused on understanding and/or weakening disgust responses in favour of promoting sexual approach. However, as we already alluded to in a previous section, disgust can also be applied to do the opposite; to weaken sexual approach (e.g., Borg et al. 2019b). Such an approach may have practical relevance in cases where the sexual approach in question is unwarranted or undesired and necessitates to be stopped (e.g., rape). In a recent experimental study among male students ($N = 78$, $M = 21.1$ years, $SD = 2.1$), we showed that sexual arousal elicited by an erotic movie could be weakened by exposure to a highly disgust-eliciting odour (Borg et al. 2019b). The odour resulted in a decrease of both subjective and genital sexual arousal compared to the participants in the odourless control condition. This study provides initial support for the relevance of using disgusting odours to undermine undesired behavioural actions motivated by sexual arousal (driven by e.g., poor judgment, coercive sexual behaviour; Borg et al. 2019b).

An important extension of the current findings would be to examine whether odour induced disgust might also attenuate automatic sexual approach behaviour (e.g., Hinzmann et al. 2019), and whether the findings in the lab can be replicated in an actual sexual context. As a first step, and partially to replicate these findings, one may use a scenario-based study in which participants are asked about their willingness to approach their preferred sexual stimuli under high and low contagion. Next, by using a virtual reality lab approach in which participants are given choices about their inclination / motivation to (sexual) approach behaviours in various types of situations under conditions of high vs. low disgust, the actual approach behaviour could be tested. Finally, in the previously described study the sample was composed only of men, thus replicating this work with women would test the robustness and generalisability of the findings.

Synthesis and Conclusions

In this chapter, we described how sexual behaviours entail confrontation with stimuli that both promote reproductive health and signal sexual appeal, and stimuli that also signal contamination and disease. Sexual behaviours and some sexual stimuli may elicit disgust responses and consequently hinder sexual arousal, whereas other sex stimuli, generally those associated with sexual appeal, may help in generating sexual arousal and are expected to weaken the disgust response related to the contaminating properties of sex. We explored pathways in understanding how people become involved in sex and sexual behaviours and discussed when the central sexual stimuli signal contagion. We also explored interventions that can be used in accentuating sexual arousal and weakening disgust, as well as novel interventions to weaken sexual arousal when this is undesired. These theoretically driven interventions are novel, however, the evidence supporting them is preliminary and further work in the area is required. In this chapter, we outlined these interventions to provide a contemporary perspective about the possible applications of disgust-based interventions in the context of human sexual expression. We also outlined a lab model of sexual disgust (Pawlowska et al. 2020), which offers a platform to test the relative efficacy of interventions aimed at reducing disgust for sexual stimuli. We hope that this chapter is helpful in inspiring future research to arrive at more conclusive answers about the mechanisms involved in the development and persistence of sexual disgust and about the procedures that are most effective in adjusting the invalidating effects of sexual disgust.

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