How Disgust Affects Social Judgments

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Abstract

The emotion of disgust has been claimed to affect a diverse array of social judgments, including moral condemnation, inter-group prejudice, political ideology, and much more. We attempt to make sense of this large and varied literature by reviewing the theory and research on how and why disgust influences these judgments. We first describe two very different perspectives adopted by researchers on why disgust should affect social judgment. The first is the *pathogen-avoidance* account, which sees the relationship between disgust and judgment as resulting from disgust's evolved function as a pathogen-avoidance mechanism. The second is the *extended disgust* account, which posits that disgust functions much more broadly to address a range of other threats and challenges. We then review the empirical evidence to assess how well it supports each of these perspectives, arguing that there is more support for the pathogen-avoidance account than the extended account. We conclude with some testable empirical predictions that can better distinguish between these two perspectives.

1. Introduction

Over the last 25 years, the emotion of disgust has attracted enormous interest from researchers studying moral and social judgment. This might seem unexpected for an emotion whose primary evolved function is thought to be the avoidance of pathogens and parasites, but many researchers have argued that the disgust response has come to play a much broader role than would be expected given its putative evolutionary function. Specifically, disgust seems to play an important role in a wide variety of social judgments. For instance, disgust has been argued to underlie moral condemnation, particularly of acts involving physical purity (such as violations of social norms regarding food, sexuality, or hygiene) or spiritual purity (such as failures of mental discipline or piety). Individual differences in how easily disgusted people are (i.e., *disgust sensitivity*) have been found to be related to a host of social judgments, including evaluations of groups perceived as sexually deviant, evaluations of specific practices (e.g., abortion, sexual promiscuity), and endorsement of broader ideologies (e.g., social traditionalism and political conservatism). This has led some researchers to argue that disgust may have been co-opted evolutionarily and now functions as a bona fide social/moral emotion that can be elicited by certain social behaviors even if they are entirely absent of any pathogen threats (Rozin & Haidt, 2013).

In recent years, however, several empirical and theoretical critiques of this perspective have emerged. For instance, some of the reported experimental effects of induced disgust on moral judgment have not been reproduced in direct replication attempts (e.g., Ghelfi et al., 2020; Johnson et al., 2016), and a meta-analysis of the effects of disgust inductions on moral judgments reported an average effect size that was statistically indistinguishable from zero after correcting

for publication bias (Landy & Goodwin, 2015). In addition, some research has questioned the relationship between individual differences in disgust sensitivity and social judgments, suggesting that a greater tendency to experience disgust might simply be correlated with harsher judgments in general (as might be expected of any negative emotion). For instance, researchers have reported that disgust sensitivity, although correlated with harsher moral judgments, is also correlated with harsher judgments of non-moral violations of social conventions (Chapman & Anderson, 2014), and even with aesthetic judgments (Landy & Piazza, 2019). Against this backdrop of empirical skepticism, researchers have also pointed out that many of the theoretical claims regarding the relationship between disgust and judgment are vague enough that they can be construed in very different ways. For example, the general claim that there is a relationship between disgust and moral judgment can be interpreted to mean that immoral behavior evokes disgust (i.e., disgust as a consequence), or that disgust amplifies moral condemnation (i.e., disgust as an amplifier), or that it moralizes otherwise non-moral behaviors (i.e., disgust as moralizer)—but these claims are often treated interchangeably in the literature (Pizarro et al., 2011).

Here, we review the evidence for disgust as a cause of social judgments with an eye toward resolving some of the empirical and theoretical disputes that have arisen over the last ten years. We focus largely on the evidence for disgust as a *cause*, rather than a *consequence*, of judgments. This is for two reasons: First, there is a recent comprehensive review of disgust as a consequence of perceived moral violations (Giner-Sorolla et al., 2018). Second, we believe that the more provocative theoretical claim is that some social and moral judgments result from disgust (rather than the reverse). This does not necessarily limit our review to experimental

studies. Many correlational studies of disgust sensitivity as an individual difference assume that differences in disgust sensitivity cause differences in some downstream judgment, perhaps because more disgust-sensitive people respond to disgust elicitors more strongly. Moreover, although correlational studies obviously pose challenges for causal inference, it can also be problematic to draw causal inferences from experimental studies for a variety of reasons (e.g., experimental manipulations can affect more than just the variable or process of interest). Accordingly, we review both correlational and experimental studies here as long as they focus on disgust as a cause of judgments, rather than a consequence.

We also limit our review to social judgments, by which we mean moral evaluations of acts and actors, evaluations of social groups, beliefs about what behaviors or practices ought to be promoted or discouraged, and broader beliefs about how society is best organized. This is obviously a broad definition, and our intention was to be as inclusive as possible. In the case of some judgments that seemed on the border between social and non-social (e.g., beliefs about science and technology; see section 5.2.5) we have erred on the side of inclusion. We have, however, excluded clearly non-social judgments and behaviors such as willingness to pay for consumer goods (e.g., Lerner et al., 2004). Our focus on social judgment is largely driven by the fact that, for many non-social behaviors (such as the avoidance of objects associated with disgust), theoretical predictions of how disgust should influence judgment are straightforward (i.e., the avoidance of the contaminating object). It is less clear how and why an emotion that evolved to protect individuals from the physical threat of pathogens would influence judgments of moral wrongness or evaluations of entire social groups.

Finally, to better organize this very diverse literature, we have categorized the types of judgments putatively influenced by disgust into moral judgments (i.e., judgments about the morality or acceptability of specific acts) and other social judgments (e.g., liking or disliking some social group or practice, social values, and broader political ideologies). Within each of these domains, we separately assess the evidence from experimental studies (where disgust is induced extrinsically to the judgment being made) and correlational studies (where individual differences in disgust sensitivity are correlated with some judgment) and evaluate consistency between them.

Before reviewing the empirical literature, we will first describe two broad theoretical views about the nature and origins of disgust, as we believe that understanding this debate is key to understanding the patterns that have emerged in empirical findings of the last 20 years. We will then explain how disgust is manipulated and measured, before finally reviewing the empirical evidence for disgust as a cause of social judgments.

2. Disgust and Social Judgment: Two Theoretical Perspectives

There is a long-running theoretical debate as to why disgust ought to be related to social judgments at all (see Table 1). On one view, which we call the *pathogen-avoidance* perspective, the influence that disgust might have on social judgment is a direct result of its evolved function as a pathogen-avoidance mechanism that mitigates pathogen and parasite threats. On this account, to the extent that, for example, inducing disgust causes increased prejudice towards some social groups, it is the result of disgust activating an evolved pathogen-avoidance mechanism that responds to certain kinds of outgroups that historically posed a greater risk of transmitting contagious diseases. On the second account, which we refer to as the *extended*

disgust perspective, disgust has expanded to serve *social* functions (likely on top of its evolved function as a pathogen-avoidance mechanism, although not necessarily). On this perspective, although the original function of disgust may have been to keep us free from physical contamination, it now underlies social judgments that are not even distantly related to pathogen avoidance. So, for example, inducing disgust might cause prejudice towards some outgroups because disgust functions to enforce social group boundaries and hierarchies.

The pathogen-avoidance perspective has its origins in evolutionary psychology (Curtis et al., 2011; Lieberman & Patrick, 2014; Oaten et al., 2009), whereas the most prominent extended account of disgust has its origins in social and moral psychology (Haidt et al., 1994; Rozin, Haidt, & McCauley, 1999; Rozin et al., 2008, 2009). Researchers in different areas have sometimes tacitly accepted the premises of one or the other perspective (or some of both) without clearly distinguishing their different premises and empirical implications. Next, we turn to a more detailed description of these two approaches.

2.1 Disgust as Pathogen Avoidance

There is a surprising amount of consensus among emotion researchers that disgust evolved as an adaptation to disease threats. Cross-culturally, there appear to be a set of common disgust elicitors that strongly suggest disgust evolved to mitigate pathogen risks by motivating the avoidance of pathogen-rich stimuli (Curtis et al., 2011; Oaten et al., 2009). These elicitors include body products and secretions (e.g., feces, urine, pus, blood); contaminated food (food with visible or olfactory indications of decay); and signs of disease (open wounds, boils, sores, coughing and sneezing). The subjective experience of disgust—a sensation of aversion, queasiness, and, in its strongest form, nausea and vomiting—also seems to reflect its evolved

function. The facial expression most associated with disgust is a wrinkled nose, squinting eyes, a raising of the upper lip, and in extreme cases the protrusion of the tongue (Ekman & Friesen, 1971; Ekman, Friesen, & Hager, 2002). This facial expression may be functional, as the wrinkling of the nose protects against the entry of pathogens into the mucus membranes of the face (Susskind et al., 2008), and the gag reflex and protrusion of the tongue are mechanisms that serve to expel potential contaminants from the mouth (evidence, perhaps, that disgust has origins as protection from oral contamination and is closely associated with taste; Rozin, Haidt, & McCauley, 1999).¹

Further evidence that disgust has evolved for pathogen avoidance comes from developmental and comparative research. Avoidance of certain disgust elicitors seems to emerge fairly early in development: Two to three-year-old children make disgust expressions at the smell of urine and feces and are reluctant to touch filthy socks (although less so than older children or adults; Stevenson et al., 2010). As children develop and need to make more choices for themselves, the range of disgust elicitors expands. For example, many young children (1.5- to 2-year-olds) will willingly consume imitation dog feces, whole dried fish, and dried grasshoppers, whereas older children refuse these foods (Rozin et al., 1986).

Some non-human animals also appear to show evolutionary precursors of disgust in their avoidance of pathogens and parasites. Mandrills will avoid grooming individuals who show signs of parasite infestation and will selectively avoid their feces (Poirotte et al., 2017). Cats and mice will likewise avoid conspecifics showing olfactory evidence of disease (Kavaliers &

¹ There is also evidence of a secondary facial expression reliably associated with disgust: a “sick” face, that involves a raised upper lip and a dropped jaw (Yoder, Widen, & Russell, 2016).

Colwell, 1995). Chimpanzees and bonobos also avoid feces and other body products, particularly feces-contaminated food (Sarabian et al., 2018).

Researchers taking a pathogen-avoidance perspective on disgust often see it as part of a broader “behavioral immune system,” a system of behaviors hypothesized to have evolved to reduce the risk of exposure to disease (Faulkner et al., 2004; Murray & Schaller, 2016; Park et al., 2003; Schaller & Duncan, 2007; Schaller & Park, 2011). Some theorists see disgust and the behavioral immune system as the same thing (e.g., Lieberman & Patrick, 2014), but we believe that there are important reasons to distinguish between the two. While disgust is an affective state (it feels like something), behaviors considered part of the behavioral immune system need not entail any such affective state. In non-human animals, for example, behaviors such as avoidance of infected conspecifics, grooming or cleaning, and avoidance of waste products are considered part of the behavioral immune system (Murray & Schaller, 2016), but researchers do not generally think that there is a subjective feeling of disgust that motivates these behaviors in animals. In humans, broad social orientations such as conformity (Murray et al., 2011) and collectivism (Clay et al., 2012) have been argued to be influenced by the behavioral immune system. Although some researchers have argued that disgust may facilitate the *development* of these social orientations (Schaller, 2014), no one thinks that (for example) any particular decision to agree with what your neighbors think is motivated by disgust. In addition, research on the behavioral immune system has typically focused on the measurement and manipulation of disease threats, which may or may not induce disgust (e.g., photos of skin lesions may be disgusting, but a passage of text describing the risk of getting ill is not). We view the pathogen-avoidance account of disgust as an approach that is consistent with disgust being part of a larger

behavioral immune system, but that focuses on the affective response that is traditionally referred to as disgust.

In sum, the pathogen-avoidance account views disgust as an emotional response whose core domain is that of avoiding exposure to disease. On this view, while disgust may influence any number of judgments, it is primarily (if not exclusively) elicited by pathogenic threats. As such, it makes a clear set of predictions regarding the role of disgust in social judgment: Disgust should influence social judgments specifically when pathogen threats are involved. So, for example, moral judgments of acts that entail physical pathogenic threats (such as certain sexual acts) would likely to be influenced by disgust, whereas moral judgments of behaviors that do not contain any pathogen threats would not be. This approach stands in contrast to the approach we turn to next, which has dominated work on disgust within moral psychology in the last two decades.

2.2 Extended Disgust

The second perspective, which we call the *extended* view of disgust, posits that the nature and function of disgust are much broader. We use the term “extended” to describe this approach because theorists adhering to it do not see the evolved function of disgust as limited to protection against threats of physical contamination, but also as addressing a range of other threats and challenges. These could be symbolic (e.g., coping with death anxiety and sanctioning violations of social or moral “purity”; Rozin et al., 2008; Rozin & Haidt, 2013) or more concrete (e.g., avoiding inappropriate sexual partners and condemning moral violations; Tybur et al. 2013). According to these accounts, disgust has expanded its role in humans through a process of preadaptation, by co-opting the disgust emotion that evolved for pathogen avoidance to serve a

completely different function: that of regulating behavior in completely novel (i.e., non-pathogenic) social domains. The most influential example of this perspective is summarized nicely by Rozin and Haidt (2013, p. 367):

“On this account, the elicitors of disgust expanded by preadaptation, but the outputs—expressive, physiological, and behavioral—were generally conserved. These included contamination sensitivity and a motivation to cleanse, avoid, or expel the contaminant. The elicitors expanded from a food rejection system related to pathogen avoidance to avoidance of reminders of humans’ animal nature, especially death, and then on to some aspects of the moral domain.”

Similarly, the philosopher Dan Kelly has defended this view, which he calls the *Co-opt thesis*, and describes it as such: “[I]n the face of...adaptive pressures, disgust was recruited to perform several novel functions, and became implicated in the psychological systems underlying cognition of social norms and ethnic boundary markers” (Kelly, 2011, p. 118).

Importantly, this view offers a very different set of predictions for how disgust might cause social judgments. If disgust is evoked by reminders of our animal nature, it may underlie prejudice towards social outgroups who are dehumanized by being seen as more animal-like (Haslam, 2006). Likewise, if disgust is evoked not only by physical contamination but also by social disorder and spiritual impurity, disgust might underlie negative reactions to groups seen as spiritually tainted or socially threatening, entirely apart from any pathogen threats they might pose (e.g., Hodson & Costello, 2007). But at its broadest, the expanded view of disgust can be taken to predict that disgust can be evoked by the violation of nearly any social or moral norm.

Those adopting the expanded view generally also adopt the claims of the pathogen-avoidance view but offer a further distinction between “core disgust” and “moral disgust” (e.g., Rozin et al., 2008). Rozin first defined “core disgust” as an emotion of revulsion at the prospect of eating offensive substances (Rozin & Fallon, 1987; from Angyal, 1941), but the terms have come to be used by many researchers to refer to the broader distinction between physical disgust and the “moral” disgust that is proposed to be at work in sociomoral evaluations that do not involve core disgust elicitors. Moral disgust has been described variously as motivating the rejection of “certain classes of violators who are beyond redemption” (Rozin, Haidt, & McCauley, 1999, p. 436) and as responding to contamination of the body and soul (Graham et al., 2009). Importantly, on this account, the set of emotional responses involved in core and moral disgust is hypothesized to be the same (as described above by Rozin & Haidt, 2013). People are thought to react with the same emotion to the smell of feces as they do to a person who has violated a moral rule that contains no physical disgust elicitor (such as violations of fairness in an economic game; Chapman et al., 2009). As evidence for this two-tiered account of core and moral disgust characteristic of the expanded view, researchers have observed that individuals report feeling disgusted and make characteristic disgust facial responses to non-pathogenic moral violations (e.g., Chapman et al., 2009; Danovitch & Bloom, 2009).²

² A somewhat different extended account of disgust was proposed by Tybur and colleagues (Tybur et al. 2009; Tybur et al. 2013). According to this view, disgust has three separate functional domains: avoiding pathogen threats, avoiding inappropriate sexual partners (i.e., kin or partners with low mate value), and communicating and coordinating moral condemnation. Despite important differences from the account proposed by Rozin and colleagues, this account also proposes that moral violations elicit the same emotion that physical pathogen threats do.

2.2.1 Criticisms of the Extended Perspective

The claim that disgust has come to be co-opted to be a sociomoral emotion has been questioned by researchers who have designed studies to specifically test this extended account of disgust. For instance, these researchers have argued that if the expanded account of disgust is correct and disgust has evolved to enforce sociomoral norms, one would expect that similar words for “disgust” across languages would encode for the emotional response to sociomoral violations as well as to pathogen threats. This is the case in English—English speakers often report being disgusted at a con artist who preys on the elderly, or on someone who has acted disloyally, for instance (e.g., Rozin, Haidt, & McCauley, 1999, p. 436). There is also evidence that disgust language is used to describe a response to sociomoral evaluations across many languages other than English as well (e.g., French, German, Hebrew; Rozin, Haidt, & McCauley, 1999). However, recent research has shown that there are many other languages for which disgust is used in a much narrower sense (i.e., only as a response to core disgust elicitors), leading researchers to conclude that the term “disgust” in English encodes for two very different kinds of emotional responses: the core disgust that arises from exposure to a pathogen threat, and something more akin to anger or moral disapproval (Gutierrez et al., 2012). The term “grossed-out,” on the other hand, describes the response to pathogens specifically, and appears to be a better translation of the term disgust across a variety of languages (Kollareth & Russell, 2017). Note that this is a problem not only for the interpretation of people’s responses to specific sociomoral norm violations, but also for individual-difference measures such as the Three-Domain Disgust Scale (Tybur et al., 2009) which defines “moral disgust” as how disgusted people say they are by pathogen-free moral violations such as lying and cheating.

Another concern regards the kinds of moral violations the extended account would predict to be associated with disgust. At times, theorists defending the extended disgust account have argued that moral violations that include physical disgust elicitors are not a good test case for sociomoral disgust. For example, Rozin, Haidt, and McCauley (1999) write that “many of the most disgusting sociomoral violations appear to be disgusting because they involve aspects of core or animal-nature disgust (e.g., the sexual molestation of children, or brutal murders that involve mutilation or other body envelope violations)” (p. 436). They contrast these cases with sociomoral violations that have no obvious core disgust content, such as “hypocrisy, racism, betrayal, and disloyalty.” However, research on the role of disgust in moral judgment has often focused on moral violations of “purity,” that is, “acts that are disgusting or degrading to one’s spiritual nature” (Haidt et al., 1993, p. 614), and many of the purity violations used in these studies clearly include pathogen content (e.g., a man masturbating into a chicken carcass before cooking and eating it; Haidt et al., 1993). The inclusion of such pathogen-relevant content in these violations means their results cannot be taken as support for the extended view.

In fact, in research that has directly tried to test whether moral violations without core disgust elicitors evoke the same emotion that core disgust elicitors do, individuals do not appear to experience the same sort of disgust as they do in response to pathogen threats. For instance, in a cross-cultural study, Kollareth and Russell (2019) created a variety of scenarios that described a moral purity violation or a non-purity moral violation, and which contained either a pathogen elicitor or not. They found that while the term “disgust” was used by both American and Indian participants when reporting responses to purity and non-purity moral violations, the term “grossed-out” (which captures the emotion of core disgust more accurately) was only used in

reporting responses to pathogen violations. In addition, ratings of immorality were not reliably related to core disgust, as would be predicted on the extended disgust account. Likewise, Royzman et al. (2014) assessed responses to moral violations that involved pathogen threats vs those that did not and showed that participants were not likely to report being grossed out, gagging, or losing their appetite for moral violations—features that would normally be present in a core disgust reaction. When given the option, people were also more likely to select the term “angry” than “grossed out” in response to non-pathogen moral violations as well as to select an “anger” face rather than a “disgust” face to describe their reactions to non-pathogenic moral violations.

In short, there is now a fair amount of evidence on the linguistic use of the term disgust that does not appear to support the extended view, which holds that the emotional response to moral violations is qualitatively identical to the core disgust response to pathogen threats. Rather, it appears as if, in some languages, the term disgust has simply come to be used in some situations as a metaphorical stand-in for an emotion that is closer to anger.

However, there are other potential sources of evidence that *could* provide support for the extended view, including evidence from the influence of disgust on social judgment. We will be reviewing the empirical literature with an eye toward this evidence. If, for instance, if it is the case that inducing disgust consistently makes people more condemning of (non-pathogenic) sociomoral violations, we would take this as evidence in favor of the extended view and against the more constrained pathogen-avoidance view. Similarly, if it is the case that individuals who are higher in disgust sensitivity tended to be consistently harsher in their judgments of (non-pathogenic) sociomoral violations (but not harsher for non-sociomoral violations), we would also

consider this as evidence in favor of the extended view. This is one of the major goals of this review—to evaluate the patterns of empirical findings on the relationship between disgust and social judgment across studies that use a wide variety of methods to investigate this broad question. It is to these methods that we turn to next.

3. The Manipulation and Measurement of Disgust

3.1 Disgust Manipulations

Experimental studies of the effects of disgust on judgment typically rely on disgust inductions that are independent from the judgment being measured (i.e., incidental affect manipulations; Loewenstein & Lerner, 2003). By inducing disgust with a stimulus that is independent of the judgment of interest, the effects of the emotion can be understood as a carry-over effect where the disgust aroused by the stimulus is (mis)attributed to the target of judgment (Clore et al., 2001). This means that for the disgust induction to affect unrelated judgments, 1) the induction must evoke disgust; 2) disgust must persist and extend to the (unrelated) judgment task; and 3) participants must be unable to correct for their feelings of disgust when making their judgments.

Disgust inductions usually either directly expose participants to disgusting stimuli or ask participants to imagine or recall disgusting situations. In the direct-exposure category, visual inductions are most common (e.g., in a meta-analysis of effects of induced disgust on moral judgments, 35 of the 73 studies used visual inductions; Landy & Goodwin, 2015). Visual inductions are often in the form of short film clips (one popular clip, from the film “Trainspotting,” depicts an addict digging through a dirty toilet bowl with his bare hands) or images, often from the International Affective Picture System (Lang et al., 2005). Some direct-exposure inductions use other sensory modalities: chemical odorants that smell of feces or decay

(e.g., Inbar, Pizarro, & Bloom, 2012), unpleasant tastes (e.g., Eskine et al., 2011; Ghelfi et al., 2020), or the sounds of vomiting (e.g., Seidel & Prinz, 2013). Some researchers have used multimodal inductions, such as asking participants to sit at a filthy desk to complete the study (Schnall et al., 2008). For imagined-exposure inductions, participants might be asked to recall and write about a disgusting event they experienced (e.g., Schnall et al., 2008) or they might be asked to picture a novel disgusting experience (e.g., listening to a detailed story describing incest; Ottaviani et al., 2013).

There is also a heterogeneous category of less common disgust inductions. For example, Wheatley and Haidt (2005) selected highly hypnotizable participants, and, during hypnosis, gave them the post-hypnotic suggestion to feel “a brief pang of disgust” when reading an otherwise-innocuous word (“take” or “often”) embedded in scenarios describing immoral behavior. Similarly, David and Olatunji (2011) paired disgusting images with an innocuous word (“part”) during a training phase, and then embedded that word in scenarios describing immoral behavior. Subliminal priming has also occasionally been used. For example, Ong et al. (2014) visually primed participants with a disgust face for 17 milliseconds, preceded and followed by a masking stimulus to ensure that they could not be perceived consciously.

Unfortunately, it is not clear which types of inductions are most effective at creating the kinds of carry-over effects that researchers are usually trying to produce. In their meta-analysis, Landy and Goodwin (2015) found that gustatory and olfactory disgust inductions were more effective at changing moral judgments than other types, but this was based on only eight studies in that category. Elsewhere, Kiss et al. (2020) found no significant heterogeneity between different disgust inductions in their effects of attitudes towards gay men and lesbians, but this

was based on only six studies. More research is needed to determine what disgust inductions, if any, consistently produce carry-over effects on judgment.

3.2 Measuring Individual Differences in Disgust

There is some debate about the terminology that should be used to describe individual differences in disgust. Most researchers use “disgust sensitivity” and “disgust proneness” interchangeably to refer to individual differences in how frequently and intensely disgust is experienced. Some, however, have argued that this ought to be called “disgust propensity” and that “disgust sensitivity” should be used to refer to how *upsetting* people find the experience of being disgusted (but see Tybur & Karinen, 2018; van Overveld et al., 2006). Without taking a side in this debate, we here use “disgust sensitivity” in the more common sense, to refer to individual differences in the frequency and intensity of disgust in response to disgust elicitors. For those interested in learning more about popular measures of disgust, there is a recent in-depth review (Tybur & Karinen, 2018).

3.2.1 Self-Report Measures of Disgust Sensitivity

Individual differences in disgust sensitivity have typically been measured using self-report scales. The two most common measures are the Disgust Scale-Revised (DS-R; Olatunji, Williams, et al., 2007), and the Three Domain Disgust Scale (TDDS; Tybur et al., 2009). The DS-R is based on the original Disgust Scale (Haidt et al., 1994), which used 32 items to measure eight theorized disgust domains: food, animals, body products, hygiene, envelope violations (i.e., blood and gore), death, sex, and magic (contagion based-magical thinking). (Note that these domains were derived from the extended account of disgust described in Section 2.2 above). Subsequently, the same authors developed the Disgust Scale 2 which reduced the number of domains to four: interpersonal disgust, core disgust, death/body envelope disgust, and sex

disgust. This version of the scale was never peer-reviewed and its validity is therefore unknown, but it is used in some research conducted before the Disgust Scale-Revised was published.

The most current, best-validated, and widely-used version of the Disgust Scale is the Disgust Scale-Revised (Olatunji, Williams, et al., 2007). The original Disgust Scale did not perform well psychometrically, showing poor measurement model fit in confirmatory factor analyses and low internal reliability of the subscales (α s = .34–.64; Haidt et al., 1994), likely because each subscale consisted of only four items. The DS-R reduced the proposed factor structure to three: core (food, animals, and body products), contamination (germs and hygiene), and animal-reminder (which now only contains death, gore, and blood items). Compared to the original Disgust Scale, the 25-item revised version shows acceptable fit in confirmatory factor analyses and higher reliability of the subscales (Olatunji, Williams, et al., 2007; van Overveld et al., 2011). It also shows convergent and discriminant validity with related measures including contamination fear, anxiety, and other trait disgust measures such as the Disgust Emotions Scale (DES; Kleinknecht et al., 1996) and the Disgust Propensity and Sensitivity Scale-Revised (van Overveld et al., 2006).

The 21-item Three Domain Disgust Scale (TDDS; Tybur et al. 2009) also has a three-factor structure, but the factor content is quite different from that of the DS-R. All pathogen-relevant items (which ask about disgust in response to pathogen cues such as dog poop, body odor, or moldy food) compose a single “pathogen disgust” subscale. Two additional subscales assess moral disgust (the extent to which respondents say they are disgusted by non-pathogen-relevant moral transgressions such as lying and cheating) and sexual disgust (the extent to which respondents report disgust at sexual promiscuity, pornography, and oral/anal sex, among other practices). Like the DS-R, the TDDS has been shown to have good psychometric properties, and

its three-factor structure fits well in confirmatory factor analyses. Nevertheless, the three subscales may not tap the same underlying emotional experience. Particularly for the moral disgust subscale, responses might also reflect more generic moral disapproval or negative affect, given the multiple meanings of “disgust” in English (Kollareth & Russell, 2017). Likewise, the TDDS sexual disgust subscale may tap sexual restrictiveness in addition to (or instead of) a genuine affective reaction; it correlates highly with other measures of sociosexuality (i.e., willingness to engage in commitment-free sex) and has often been used interchangeably with them (Tybur & Karinen, 2018).

Therefore, when using the TDDS researchers generally use only the pathogen subscale to measure “disgust sensitivity.” When using the DS-R, researchers most commonly use the entire scale. We think that this is reasonable. Although the DS-R was derived from the extended disgust account and thus is not exclusively focused on pathogen-threatening stimuli, there are conceptual and empirical reasons to think that both the DS-R and the TDDS pathogen subscale measure sensitivity to pathogen threats. Conceptually, all the TDDS pathogen items and most of the DS-R items ask about pathogenic stimuli: decay, blood and body products, signs of disease, and so on. Empirically, the three DS-R factors are correlated strongly with each other ($r_s = .66-.84$; Olatunji et al., 2007), and total DS-R scores are strongly correlated with the TDDS pathogen subscale ($r = .65$). In contrast, total DS-R scores correlate much more modestly with the TDDS sexual and moral disgust subscales ($r_s = .38$ and $.12$ respectively; Tybur et al., 2010). Finally, meta-analyses (e.g., Terrizzi et al., 2013) treat the DS-R and TDDS pathogen subscale interchangeably as measures of pathogen disgust. We will follow this practice and assume that the two scales measure roughly the same construct, although we will usually note when researchers use one or the other.

3.2.1.1 Behavioral Validation of Self-Report Measures

Disgust sensitivity as assessed by self-report is related, as one would expect, to behavioral avoidance of objects seen as unclean or contaminating. People higher in disgust sensitivity have been found to be more reluctant to touch used combs and floor cookies (Deacon & Olatunji, 2007), sterilized cockroaches and previously-worn fedoras (Rozin, Haidt, McCauley et al., 1999), worms and moldy oranges (Olatunji, Lohr, et al., 2007), used tissues (Fan & Olatunji, 2013), and colostomy bags (Reynolds et al., 2014). There is thus consistent evidence that people who say they are more disgust sensitive are more reluctant to touch disgusting items. One caveat is that all these studies used versions of the Disgust Scale. One study (Olatunji et al., 2012) that used the TDDS pathogen subscale found that it was not significantly associated with reluctance to touch a public toilet (although the relationship was directionally consistent).

3.2.2 Physiological Measures of Disgust Sensitivity

Less commonly, researchers have assessed disgust sensitivity by measuring physiological reactivity to disgusting stimuli. Smith et al. (2011), for example, measured skin conductance as participants viewed three disgusting images and computed the change from baseline skin conductance as an index of physiological reactivity. Aarøe et al. (2017) measured skin conductance as participants viewed six disgusting images and computed physiological reactivity as the average of the skin conductance from one to fifteen seconds after stimulus onset across the six images. However, there seems to be mixed evidence for the relationship between physiological reactivity and self-reported disgust sensitivity. Smith et al. (2011) found that skin conductance was not correlated significantly with self-reported disgust sensitivity as measured by the DS-R, but Olatunji et al. (2012) found that skin conductance response when viewing five

disgusting images was correlated with TDDS Pathogen disgust ($r = .34$; note that in this case skin conductance scores were adjusted for skin conductance at baseline).

We believe that these measures are promising but should be interpreted cautiously given the limited evidence of their validity and the fact that they have been computed in different ways by different research teams (see Flake & Fried, 2020).

3.3 Comparing Induced Disgust and Disgust Sensitivity

It is appealing to think that studies that induce disgust and those that measure disgust sensitivity are testing the same underlying process. That is, researchers may assume that by inducing disgust (vs. not) one can randomly assign participants to be more like people who are higher in disgust sensitivity (and are chronically more strongly and frequently disgusted). This logic is appealing, and in some cases it is surely reasonable. However, in other cases it may not be. As an analogy, imagine a “chronic thirst scale” that asks people to report how frequently and strongly they experience thirst. On some outcomes (e.g., current desire for a glass of water) one would expect people who score high on this scale to be like people who have been assigned to drink nothing for six hours. However, this is not necessarily true for all outcomes associated with chronic thirst. For example, the chronically thirsty might support greater public drinking fountain availability, believe that retail stores should be legally required to offer shoppers water, support political parties who advocate for more public investment in water infrastructure, and so on. It is not obvious that someone who is only temporarily thirsty would shift their beliefs in this direction, because the relationship between *chronic* thirst and beliefs is the result of a longer and less direct causal chain established over time, and perhaps now supported by any number of related factual beliefs and moral commitments. As Hatemi et al. (2013, p. 281) put it, dispositional differences in emotion can “exert influence throughout one’s life, including

downstream preferences, and alter how one selects into and experiences specific environments.”

A very similar argument is made by Schaller (2014), who argues that disgust may lead to the adoption of broad social beliefs (such as a dislike of non-conformity) which are then activated and expressed without a subjective feeling of disgust.

The process comparability between induced disgust and disgust sensitivity might therefore depend on whether the dependent variable is more like the desire for a glass of water or more like support for societal thirst-reduction initiatives. This is partly a theoretical question, but there are also helpful empirical indicators. If induced disgust and disgust sensitivity generally show the same pattern of relationships with dependent variables, this should increase our confidence that the underlying processes are the same. If they do not show the same pattern of relationships, that should undermine our confidence. In the following sections, we examine the relationship between induced disgust and disgust sensitivity on the one hand, and moral judgments (Section 4) or social judgments (Section 5) on the other. We begin with the relationship between disgust and moral judgments.

4. Disgust and Moral Judgments

“Moral judgment” is notoriously a fuzzy category. In their review of moral disgust, Chapman and Anderson (2013) write that “there is as yet no consensus as to how morality should be defined” (p. 301). It can be challenging to cleanly distinguish moral from social judgments; because morality is often about the regulation of behavior in others, many moral judgments are inherently social. In addition, there is a great deal of debate about whether the domain of morality is in any sense unified, with some researchers arguing that psychologists and philosophers have forced very different kinds of judgments into a general “moral” bucket with little justification (Parkinson et al., 2011).

Fortunately, for the purposes of this review we do not need to arrive at a definitive answer as to the difference between moral judgments and other social attitudes. Our goal is rather to organize the literature to reflect the way that researchers have most commonly divided up the conceptual territory. As such, when we discuss moral judgments, we mean expressions of (dis)approbation towards an individual or their action because of the perceived violation of a normative standard (i.e., a belief about how people ought to act). When we refer to social (and political) judgments we mean beliefs about social groups, what behaviors ought to be socially encouraged or discouraged, and how society is best organized. Of course, these categories are blurry around the edges. For example, a religious traditionalist who believes that homosexuality is sinful would likely view gay people as a group more negatively. This would also likely entail harsher moral judgments of a specific individual who has same-sex relationships, although in this case those moral judgments would be downstream of the broader belief about the sinfulness of homosexuality. Luckily, the distinction is generally less fuzzy in practice than in theory. Research on disgust and moral judgment tends to ask about moral transgressions that are not linked to any larger group membership, such as lying, cheating, or unusual sex. In contrast, research on disgust and social attitudes tends to ask about evaluations of groups, or support for specific laws and policies.

4.1 Effects of Induced Disgust on Moral Judgment

Research on the effects of induced disgust on moral judgment only began fairly recently, but it has expanded rapidly following several influential early studies. In one especially well-known set of studies (Wheatley & Haidt, 2005), highly hypnotizable participants were given post-hypnotic suggestions to feel disgusted in response to specific “trigger” words. Participants judged moral transgressions (e.g., a politician condemning corruption while secretly taking

bribes) as more immoral when they were described in scenarios containing the trigger words, vs. in scenarios that contained neutral words (Wheatley & Haidt, 2005). Subsequent studies found that more commonplace disgust elicitors also led to harsher moral judgments. Participants who completed questionnaires next to a smelly trash can or at a messy desk rated practices ranging from consensual sex between first cousins to resume falsification as more immoral (e.g., Schnall et al., 2008), and participants who tasted a bitter drink subsequently rendered harsher moral judgments (on the same scenarios used by Wheatley and Haidt, 2005) compared to those who tasted a sweet drink or unflavored water (Eskine et al., 2011).

However, as this literature grew, so did the inconsistencies between findings. First, there has been little consistency as to whether the effects of disgust are specific to certain kinds of moral violations concerning “purity,” or whether they influence judgments of moral violations more generally. Purity violations are defined as behaviors that are “disgusting or degrading to one’s spiritual nature” (Haidt et al., 1993, p. 614) but have generally been operationalized as lack of physical cleanliness or non-traditional sexual practices. Some researchers have found effects of induced disgust on moral judgments only for violations of purity. For example, Horberg et al. (2009) found that induced disgust increased condemnation of purity violations such as “keeping an untidy and dirty living space” and “being sexually promiscuous.” Others, however, have found that disgust causes greater condemnation of all moral violations, whether they are purity-relevant or not (e.g., Schnall et al., 2008). One study even found that disgust led participants to condemn morally neutral behavior (a student council member choosing topics for discussion; Wheatley & Haidt, 2005).

A second inconsistency concerns the moderation of experimental disgust manipulations by individual differences. Some studies (e.g., Schnall et al., 2008, Studies 2 and 3) have found

significant effects of disgust on moral judgment only for those who are chronically more focused on their internal physical states (i.e., people high in “private body consciousness,” Miller et al., 1981). Others have found unmoderated main effects of disgust on moral judgment (Eskine et al., 2011; Horberg et al., 2009; Schnall et al., 2008, Study 1; Wheatley & Haidt, 2005). Taken together, these inconsistencies raise the concern that some of the initial findings of relationships between disgust and moral judgment might be false positives, especially because these studies are from an era in social psychology where sample sizes were small, *p*-hacking and selective publication were common, and direct replications were not (Nelson et al., 2018). These concerns were a large part of the motivation for Landy and Goodwin (2015) to conduct a meta-analysis of the studies looking at the effects of induced disgust on moral judgment. Although they found a small aggregate effect of disgust on moral judgment ($d = .11$), it was not statistically distinguishable from zero when correcting for publication bias ($d = -.01$). Even using the uncorrected effect size estimate, the studies in their analysis would have been dramatically underpowered, as 80% power to detect $d = .11$ in a two-group between-subjects design requires a total sample size of nearly 2,600.

These conclusions have been contested (Schnall et al., 2015) on the grounds that the effects of disgust on moral judgment might be moderated by other individual differences such as attentional control (van Dillen et al., 2012), emotional differentiation (Cameron et al., 2013), or mindfulness (Sato & Sugiura, 2014). However, research in the last few years has largely borne out the pessimistic case. As it has become easier to publish non-significant results, more researchers have reported finding null relationships between disgust and moral condemnation (Białek et al., 2021; Jylkkä et al., 2021; Sanyal et al., 2021). Furthermore, two large replication attempts of early and influential studies have failed to replicate the original results. The first was

a multi-site direct replication of the finding reported in Eskine et al. (2011) that tasting a bitter liquid caused people to make harsher moral judgments. This replication attempt (Ghelfi et al., 2020) found a negligible effect of taste on moral judgments, despite having a much larger sample size ($N = 1,137$) than the original ($N = 57$). Bayesian analyses showed that the observed effects were most consistent with the null hypothesis of no relationship between taste and moral judgments.

Another team (Johnson et al., 2016) attempted to replicate the finding that recalling a disgusting experience caused people high in private body consciousness (PBC) to make harsher moral judgments (Schnall et al. 2008, Study 3). Two large studies (combined $N = 1,412$) found no significant main effects of disgust on moral judgments and no significant moderation by PBC. Again, Bayesian analyses showed that the observed effects were strongly consistent with the null hypothesis.

At the same time, new studies have been published proposing new moderators (e.g., psychological distance; van Dijke et al., 2018). However, pre-registered replications of these moderations are lacking. Furthermore, a set of findings showing effects of disgust *only* when moderated by different individual differences is internally contradictory if each study finds the effect of disgust on judgments is only significant when moderated by a variable that the other studies did not measure. Thus, a literature showing many different moderated effects but few or no main effects should *reduce* our confidence rather than increase it. Without pre-registration, moderation allows analytic flexibility (if the unmoderated main effect is significant but the moderator is not, report the main effect; if the main effect is not significant but the moderation is, report the moderation), raising the likelihood of false-positive results (Gelman & Loken, 2014).

Our overall assessment of this literature is that, despite several initial positive results, there is not enough evidence to conclude that inducing incidental disgust leads to any change in moral judgments. Our conclusion is based on the meta-analysis of studies conducted up to 2014 (Landy & Goodwin, 2015), the negative results (including high-powered replication studies) published since then, and the lack of convincing pre-registered studies showing main effects of disgust or moderation by individual differences. This is obviously not to say that such evidence might not emerge in the future, only that it is currently lacking. We next turn to the research examining relationships between individual differences in disgust sensitivity and moral judgment.

4.2 Relationships Between Disgust Sensitivity and Moral Judgment

There are a number of studies showing a relationship between greater disgust sensitivity and harsher moral judgment. As we will see, these findings are consistent enough that it is safe to conclude that there is some relationship between disgust sensitivity and judgments. The open question is how general this relationship is. Is disgust sensitivity associated preferentially with only certain kinds of moral judgments, with moral judgments overall, or even more broadly with non-moral interpersonal judgments? Overall, it seems that the evidence points to a broader relationship between disgust sensitivity and judgments than was initially believed.

In one set of studies, Jones and Fitness (2008) created ad hoc disgust scales by selecting items (8 items in Study 2; 13 items in Study 3) from the 32-item Disgust Scale (α s = .34–.64; Haidt et al., 1994). They found that participants scoring higher in disgust sensitivity were more likely to find a hypothetical defendant guilty in a mock-jury paradigm (Study 2) and were more likely to rate defendants described in four vignettes as more likely to be guilty (Study 3). Higher disgust sensitivity was also associated with rating four separate criminals (a con man, murderer, drunk driver, and drug trafficker) as more evil (Study 3). Overall, these studies lend moderate

support for a link between disgust and moral judgment. The dependent variables are not all purely about moral judgment (i.e., a judgment of guilt can be the result of beliefs about facts rather than the moral badness of a behavior), but “evilness” can straightforwardly be interpreted as a judgment of bad moral character. The interpretability of these findings is somewhat lessened by the use of unvalidated ad hoc scales, but overall these studies provide some evidence of a link between disgust sensitivity and harsher moral judgment.

While the studies in Jones and Fitness (2008) suggest a broad relationship between disgust sensitivity and moral judgment, there is evidence pointing to a more specific relationship between disgust sensitivity and moral purity violations (behaviors that are “disgusting or degrading to one’s spiritual nature”; Haidt et al., 1993, p. 614). Horberg et al. (2009) created an ad hoc three-item disgust sensitivity measure that asked participants to rate how frequently they felt “grossed out,” “disgusted,” and “repulsed.” They found that scores on this measure were significantly associated with how much participants thought purity-violating behaviors should be punished (behaviors included “being sexually promiscuous,” “buying music with sexually explicit lyrics” and “purposefully wearing unmatched clothing”), even when controlling for self-rated political ideology. Disgust sensitivity was not, however, associated with participants’ desire to punish harm- or injustice-relevant behaviors (e.g., “kicking a dog that is blocking a doorway,” “expecting to be given special rights or treatment”). However, there are some features that complicate the ability to interpret these results—the ad hoc disgust scale, the small sample ($N = 88$), and the oddness of asking liberal U.C. Berkeley undergraduates how much buying explicit music and wearing unmatched clothes should be punished.

More recent findings have called into question the idea that disgust sensitivity is exclusively associated with the evaluation of moral violations having to do with purity. Karinen and

Chapman (2019) meta-analyzed six studies (total $N = 1,082$) in which participants were asked to rate the moral wrongness of instances of mild-to-moderate harm (e.g. “a female student slaps another girl in the face”). No purity violations were included, nor did any scenarios contain physical disgust elicitors. Nonetheless, wrongness ratings were significantly associated (standardized $b = .22$) with disgust sensitivity as measured by the Disgust Scale-Revised.

In fact, it appears that disgust sensitivity is even associated with condemnation of non-moral behaviors. Chapman and Anderson (2014) examined the relationship between disgust sensitivity (as measured by the original Disgust Scale in Study 1 and the Disgust Scale-Revised in Study 2), wrongness ratings of moral violations (e.g., “a female student slaps another girl in the face”), and wrongness ratings of violations of social convention (e.g., “a student wears a t-shirt and jeans to school instead of the school uniform”). In both studies they found that higher disgust sensitivity was associated with greater wrongness ratings for both moral *and* conventional transgressions. In Study 2, these relationships held when controlling for social conservatism using a previously validated issue-based scale (Henningham, 1996). While these findings are consistent with the claim that there is a relationship between disgust sensitivity and moral judgment, they call into question the claim that this relationship is specific to moral judgment (or to moral judgment only in the purity domain). Rather, they suggest that it may be a result of a broader relationship between disgust sensitivity and social judgment in general.

A further challenge to the claim that there is a special relationship between disgust sensitivity and moral judgment comes from a recent set of studies (Landy & Piazza, 2019), which found a relationship between disgust sensitivity (as measured by the TDDS pathogen subscale) and immorality ratings for not only moral and conventional violations, but also for imprudent behaviors (e.g., running in the rain). The authors also found that disgust sensitivity (this time

measured with the DS-R) was also associated with lower judgments of the intelligence and competence of individuals engaging in imprudent behaviors (Study 2), and with more extreme judgments (positive or negative) of faces, landscapes, (painted) portraits, and abstract art.

There is, however, also strong evidence for some specificity in the relationship between disgust sensitivity and moral judgment. In five studies (one of which was pre-registered), Wagemans et al. (2018) found that disgust sensitivity as measured by the DS-R was correlated more strongly with moral condemnations of violations of purity than with other moral violations (across the five studies, disgust sensitivity correlated with condemnation of purity violations at $r = .40$ on average; correlations for the other violations ranged from r s of .07 to .27 depending on the domain). These studies drew moral violations from previously-validated vignettes based on Moral Foundations Theory (Clifford et al., 2015), which operationalize moral purity as violations of sexual and food taboos. These items (e.g., “You see a story about a remote tribe eating the flesh of their deceased members”; “You see a woman having intimate relations with recently deceased loved one”) clearly are descriptions of pathogen threats rather than conceptual or symbolic purity violations (e.g., disrespecting a sacred object).

What is to be made of the seeming inconsistencies across these studies, which all purport to have a similar aim (that of testing the relationship between moral judgment and disgust sensitivity)? Overall, the research with the strongest indicators of reliability (i.e., use of validated scales, large sample sizes, pre-registration) shows a relationship such that individuals higher in disgust sensitivity tend to make harsher moral judgments, but also tend to make harsher judgments of non-moral behaviors, suggesting that at least part of the DS-moral judgment relationship is due to a broader relationship between disgust sensitivity (or perhaps of emotional reactivity in general; Landy & Piazza, 2019) and negativity in social judgment. However, it is

interesting to note that the strongest evidence for specificity—that is, for selective affinity between disgust sensitivity and certain moral judgments (Wagemans et al., 2018)—comes from studies that have investigated judgments regarding behaviors that were specifically in the pathogen-threatening domains of food and sex.

4.3 Disgust and Moral Judgment: Summary

In Section 3.3 we asked whether induced disgust and disgust sensitivity might be similarly related to judgment. In the case of moral judgment, it seems that they are not. The evidence for *any* relationship between induced disgust and moral judgment is currently weak. As mentioned above, both a recent meta-analysis (Landy & Goodwin, 2015) and recent large-scale replication attempts (Ghelfi et al., 2020; Johnson et al., 2016) suggest that the effects of induced disgust on moral judgment are trivially small or null. The findings regarding the relationship between disgust sensitivity and moral judgment look quite different. Here, there are broad and replicable relationships, but they may not be specific to moral judgments per se (Landy & Piazza, 2019). The strongest evidence for specificity is for moral judgments of scenarios with clear pathogen content (e.g., cannibalism and necrophilia; Wagemans et al., 2018).

The simplest explanation for this pattern of results is that disgust does not directly affect moral judgment in the way that theorists initially claimed (Haidt, 2001). That is, there is currently not convincing evidence that people rely on an in-the-moment feeling of disgust to determine whether a behavior is immoral, or, if it is immoral, to determine how much it ought to be condemned. This does not mean that there is not a class of moral violations that may have *originally* become moralized because of their associations with pathogen risk (such as sexual and food taboos). But it does not appear that morally condemning these violations (or any others) results from feeling disgust in the moment.

The broad relationship between disgust sensitivity and moral, conventional, prudential, and aesthetic judgments is most plausibly due to a relationship between general negative emotional reactivity and disgust sensitivity (for example, Olatunji et al., 2007 found the DS-R to correlate with state anxiety at $r = .23$; Tybur & De Vries, 2013 found a correlation of $r = .18$ between the TDDS pathogen subscale and HEXACO PI-R emotionality). Importantly, these results do not appear to offer support for the extended perspective on disgust, which would predict 1) a clear effect of induced disgust on moral judgment (or on moral judgments for non-pathogenic purity violations) 2) a specific relationship between disgust sensitivity and moral judgment (or a more specific relationship between disgust sensitivity and moral judgments for non-pathogenic purity violations). There is greater support for the pathogen-avoidance account of disgust, which (definitionally) holds that more pathogen-sensitive people will react more strongly to pathogen threats—and would thus predict a specific relationship between disgust sensitivity and harsher judgments of behaviors with pathogen content (Wagemans et al., 2018).

5. Disgust and Social Judgments

We now turn to the literature on disgust's influence on social judgments, by which we mean beliefs about and evaluations of social groups, beliefs about what behaviors ought to be socially encouraged or discouraged, and broader beliefs about how society is best organized. We begin with the research examining the effects of induced disgust on social judgments.

5.1 Effects of Induced Disgust on Social Judgments

5.1.1 Sexual Minorities

There is consistent evidence that many people report feeling disgusted by gay men and lesbians (Haidt et al., 1997; Herek, 1993), and it is a common tactic for anti-gay rhetoric to appeal to themes of disgust, especially regarding sexual acts (Nussbaum, 2010). There is reason

to believe that recruiting disgust to amplify anti-gay sentiment may be an effective strategy, given that the sexual domain is one in which pathogen concerns are active (Tybur et al., 2015a). This would also suggest that inducing disgust should be a particularly effective strategy for amplifying negativity toward *any* group of individuals who engage in non-traditional sexual acts (as defined by the majority), not just gay men and lesbians. However, most of the research looking at the relationship between disgust and evaluations of sexual minorities has focused on evaluations of gay men and lesbians.

For example, Dasgupta et al. (2009) found that, compared to a control group who viewed neutral images, participants who viewed disgusting images (e.g., a cockroach on a piece of food) subsequently showed more negative implicit evaluations of gay people relative to straight people on the Implicit Association Test (IAT; Greenwald et al., 1998). Similarly, Inbar et al. (2012) found that participants who were exposed to a noxious odor rated gay men less positively relative to straight men (vs. those who were not exposed to the odor), and Cunningham et al. (2013) found that participants who were exposed to a noxious odor (a chemical mixture described as “body odor”) were less positive towards gay men less on both an explicit and an implicit measure.

These findings seem to represent consistent evidence for the claim that induced disgust leads to more negative evaluations of gay men and lesbians. However, the size of the effects across these studies varies widely. In their recent review of studies looking at the effects of induced disgust on attitudes towards gay people, Kiss et al. (2020) found six studies total with effect sizes ranging from $d = .16$ to $.61$.³ It should be noted, however, that the total number of studies is

³ This range omits two very large effect sizes ($ds = 2.38$ and 3.76) that appear to be the result of a calculation error in Kiss et al. (2020). The average meta-analytic effect size when excluding those studies is $d = .44$.

small and that the authors might not have been able to locate all unpublished studies, despite making efforts to do so.

The evidence suggests that inducing disgust does not have a similar effect on evaluations of all social groups. To the extent that researchers have included other social groups in their studies, the effects of disgust appear to be specific to evaluations of gay men and lesbians. For instance, both Inbar et al. (2012), and Cunningham et al. (2013) included evaluations of other social groups in their studies (such as African-Americans and the elderly), and found that disgust manipulations did not affect those ratings. Similarly, Dasgupta et al. (2009) found that induced disgust affected implicit evaluations of gay men, but not implicit evaluations of African-Americans (whereas induced anger had the reverse effect).

5.1.2 Minimal Outgroups

Evidence for the effects of induced disgust on evaluations of other social groups is generally less conclusive. As mentioned above, some studies looking at the effects of induced disgust on judgments about sexual minorities have used other social groups as controls and have failed to find any effects on these judgments. There are, however, two experiments suggesting that inducing disgust might make people more negative towards outgroups in general. Buckels and Trapnell (2013) randomly assigned participants to view a slideshow of images that were either disgusting (e.g., a dirty toilet), sad (e.g., a young boy crying), or neutral (e.g., a lamp). All participants then completed a minimal-groups task in which they were informed that they were “overestimators” and that another group of participants (the outgroup) were “underestimators.” In a subsequent IAT, participants who had seen the disgusting images showed stronger associations between ingroup members and “human” words (e.g., person, humanity, people) and outgroup members and “animal” words (e.g., pet, mongrel, critter) relative to the other two

groups (i.e., those who had seen sad or neutral images). The authors used these findings to argue that inducing disgust caused outgroup dehumanization (although they acknowledged that because the IAT measures relative associations, part or all of the effect might be due to stronger associations between ingroup and human in the disgust condition).

Similarly, Dasgupta et al. (2009, Study 1) induced disgust or anger with an autobiographical recall task. All participants then completed a minimal-groups task in which they were (falsely) told that they were “underestimators” or “overestimators.” Compared to a control group who recalled a neutral event, both induced-disgust and induced-anger participants showed more positive implicit associations to the ingroup relative to the outgroup.

5.1.3 Immigrants and Foreigners

Some researchers have argued that, given its role in motivating the avoidance of pathogens, disgust ought to play a role in motivating the avoidance of immigrants and foreigners. On this account, foreign (i.e., unfamiliar) groups inherently pose a greater disease threat, because they may carry pathogens from unfamiliar ecologies (Fincher & Thornhill, 2012; Thornhill et al., 2009). Disgust therefore ought to make people more negative towards these groups, just as it does towards sexual minorities. Consistent with this account, anti-immigrant rhetoric sometimes explicitly mentions threats of disease or likens immigrants to disease-carrying animals (Savage, 2007). However, although the assumption that non-local pathogens are more dangerous seems plausible, it has been contested by some researchers on the grounds that most pathogens are locally adapted and thus are *less* virulent to hosts not from the local ecology (de Barra & Curtis, 2012), and that pre-modern humans did not encounter others from radically different ecologies (van Leeuwen & Petersen, 2018).

While there is some experimental evidence for a link between disgust and anti-immigrant sentiment, the findings across studies are inconsistent. In one study, Navarrete and Fessler (2006) asked participants from the U.S. to provide ratings of (ostensibly) American and foreign essay writers (who wrote pro- and anti- U.S. essays, respectively), either before or after they completed the DS-R. They found that participants who completed the DS-R before providing ratings rated the American writer more positively (and the foreign writer non-significantly more negatively), compared to participants who provided their ratings first and the DS-R second. The authors argued that in this study the DS-R served as a disgust induction, as it describes a variety of disgust elicitors (although they did not report a manipulation check). Similarly, Faulkner et al. (2004, Study 5), found that after viewing an informational slideshow about germs (vs. non-disgusting common hazards) Canadian participants were more supportive of allowing a familiar foreign group (Scots) to immigrate to Canada and less supportive of allowing an unfamiliar foreign group (Nigerians) to immigrate. There were, however, no significant effects of the manipulation for 18 other items pertaining to the two groups, including whether participants thought they would bring health problems or criminal problems into Canada, and ratings of the groups on attributes including “sanitary,” “filthy,” “hygienic,” “clean,” “dirty,” “likeable,” “hostile,” and “trustworthy.” A second study using the same manipulation (Study 6), found no effects on any ratings of Taiwanese people (familiar group) or Mongolians (unfamiliar group). Finally, Ji et al. (2019) found no significant effects of induced disgust on anti-immigrant sentiment across four studies (total $N = 1,849$), even though manipulation checks showed that the manipulations successfully induced disgust.

5.1.4 Induced Disgust and Social Judgments: Interim Conclusions

Overall, there is not consistent evidence that induced disgust causes greater negativity towards social groups other than sexual minorities. There are not many published studies on other groups, and the studies that do exist have shown mixed results or have assessed behaviors that are several steps removed from liking or disliking real social groups (e.g., implicit associations to minimal in- and outgroups). The strongest evidence is for a link between induced disgust and evaluations of gay people—and in several of these studies, researchers found that the effects of disgust were specific to gay people and did *not* extend to other social groups. As sexual behavior is clearly pathogen-relevant (Tybur et al., 2015a), whereas other social groups are less clearly pathogen-relevant, this pattern of results is most consistent with the pathogen-avoidance account of disgust (which would obviously predict the strongest relationship between disgust and evaluations of clearly pathogen-relevant groups). It is less consistent with extended accounts of disgust, which would predict a relationship between disgust and social groups defined much more broadly (e.g., Hodson & Costello, 2007). We next turn to the literature linking individual differences in disgust sensitivity to social judgments.

5.2 Relationships Between Disgust Sensitivity and Social Judgments

5.2.1 Overall Political Ideology

A substantial body of research has linked disgust sensitivity (generally assessed using the Disgust Scale-Revised or the pathogen subscale of the Three Domain Disgust Scale) with an individual's overall political ideology (i.e., their description of themselves as liberal or conservative, or their political party identification). A relationship between disgust sensitivity and conservative/liberal self-placement was first documented by Inbar et al. (2009), who found that disgust sensitivity—as measured by an unpublished short form of the Disgust Scale in Study

1 and by the 32-item Disgust Scale 2 in Study 2—was correlated with participants' rating of themselves as liberal vs. conservative on a single item in Study 1, and on a composite measure that asked participants to rate themselves as "liberal," "Democrat," "conservative" and "Republican" (on separate items) in Study 2. Tybur et al. (2010), however, reported a failure to replicate the relationship between pathogen disgust sensitivity and self-reported political orientation in a U.S. undergraduate sample using both the DS-R and the TDDS. This led Inbar et al. (2012) to attempt to replicate their original finding from Inbar et al. (2009) using a larger sample of about 25,000 US respondents and 5,000 international respondents. In both the US and the international sample, they found the predicted relationship between disgust sensitivity (as measured by the DS-R) and ideology, with more disgust sensitive respondents rating themselves as more conservative on average. In the US sample, the correlation between disgust sensitivity and self-reported overall ideology was $r = .17$; effect sizes in the international sample were somewhat larger (r s = .22—.33). In addition, the relationship between disgust sensitivity and ideology held when controlling for demographics including gender, age, education, and religiosity, as well as the Big Five personality traits (openness, conscientiousness, agreeableness, extraversion, and neuroticism). For the subset of participants who separately reported their political orientation in social, economic, and foreign-policy domains, the relationship with disgust sensitivity was stronger for social conservatism ($r = .20$) than for economic and foreign-policy conservatism (r s = .09 and .15, respectively). The larger effect size estimates for social conservatism are consistent with the findings reported in a meta-analysis that examined the relationship between measures of disgust sensitivity and social conservatism specifically. Depending on the meta-analytic model used, these effect size estimates ranged from $r = .23$ to $r = .31$ (Terrizzi et al., 2013).

There is thus consistent evidence across a wide set of studies for a moderately-sized relationship between disgust sensitivity and political ideology in the US and elsewhere, with individuals higher in disgust sensitivity showing the largest correlation with social conservatism (rather than conservatism regarding economic or foreign policy). Why does this relationship exist? For some theorists who hold an extended view of disgust, there is a broad compatibility between disgust as an emotion of rejection and contamination and support for intergroup hierarchies, derogation of groups and individuals seen as inferior, and a dislike of socially “deviant” groups that are seen as violating social norms and values (see Hodson & Costello, 2007). On this account, because all these ideological orientations are constituents of conservative ideology (Jost et al., 2003), there is an emergent overall relationship between disgust sensitivity and ideology.

The pathogen-avoidance account of disgust sees the relationship between disgust sensitivity and ideology as more specific. On this account, many traditional norms in domains including food, sex, and hygiene likely evolved culturally to mitigate pathogen risks (e.g., favoring pathogen-mitigating methods of food preparation and storage, sexual restrictiveness, and specific purification and cleansing practices; Murray & Schaller, 2012; Schaller & Murray, 2008). Because food, sex, and body products are core disgust elicitors, those who are more disgust-sensitive should be more attracted to these traditional norms and values, which are often conceived of explicitly as helping individuals avoid contamination (Schweder et al., 1997). Therefore, on this account, the overall relationship between disgust sensitivity and political ideology (for example, self-description as liberal or conservative) is simply a downstream consequence of greater social traditionalism among the more disgust-sensitive.

To test one part of this explanatory account, Tybur et al. (2016) examined the relationship between disgust sensitivity (as measured by the TDDS pathogen subscale), traditionalism (as measured by the six-item traditionalism subscale of the Authoritarianism-Conservatism-Traditionalism scale; Duckitt et al. 2010) and social dominance orientation (SDO). Social dominance orientation is thought of as encompassing a competitive view of intergroup relations, a preference for group hierarchies, and prejudice towards other racial or ethnic groups (Pratto et al., 1994). Across 30 nations, disgust sensitivity was correlated with greater traditionalism ($r = .10$) but not higher SDO ($r = -.06$). This pattern of results supports the narrower pathogen-avoidance account over broader extended accounts, which would plausibly have predicted a relationship between disgust sensitivity and both SDO and traditionalism. The pathogen-avoidance account would not, however, predict a relationship between SDO and disgust sensitivity.

Research on the relationship between disgust sensitivity and other intergroup judgments is also informative for distinguishing between these two accounts of disgust. We start with the research on the relationship between disgust and evaluations of sexual minorities.

5.2.2 Sexual Minorities

As with induced disgust (see Section 5.1), some of the strongest evidence for a relationship between disgust sensitivity and social judgments is for evaluations of sexual minorities (particularly gay men and lesbians, but also bisexuals and transgender men and women). A relationship between attitudes towards sexual minorities and scores on the original Disgust Scale (Haidt et al., 1994) is somewhat tautological because that scale includes an item about homosexuality (“I think homosexual activities are immoral”). However, the Disgust Scale-Revised dropped all the sex items, and the pathogen subscale of the Three-Domain Disgust Scale

does not contain any items concerning sex. As such, the relationships we describe here are not simply the result of content overlap between measures.

In one study, Olatunji (2008) found a correlation of $r = .30$ between disgust sensitivity (as measured by the DS-R) and the Index of Attitudes Towards Homosexuals (Hudson & Ricketts, 1980), a 25-item measure assessing discomfort with interpersonal contact with gay people. Subsequent research found a similar relationship between disgust sensitivity and implicit evaluations: Inbar et al. (2009) found that greater disgust sensitivity (as measured by the Disgust Scale 2 with the eight sex items removed) was correlated with scores on the gay-straight IAT (Nosek et al., 2006). The more disgust sensitive participants were, the more they had negative associations with gay men and lesbians as compared to heterosexuals (standardized $b = -.30$).

In a recent meta-analysis, Kiss et al. (2020) analyzed 58 tests of the relationship between disgust sensitivity and evaluations of gay men and lesbians and estimated an overall effect size of $r = .31$. This aggregate effect size estimate is the average of studies using a heterogeneous mix of measures of disgust sensitivity so its magnitude may not be particularly interpretable, but overall it seems safe to say that disgust sensitivity is reliably related to negativity towards gay men and lesbians. There is evidence that this relationship extends to other sexual minorities including transgender men and women. For instance, Vanaman and Chapman (2020) found that greater disgust sensitivity (as measured by the pathogen subscale of the TDDS) was associated with greater support for requiring people to use public bathrooms that match their birth sex (that is, requiring transgender men and women to use bathrooms that do not match their felt/expressed gender identity).

Indeed, disgust sensitivity seems to be broadly related to evaluations of groups associated with sex. Crawford et al. (2014) found that disgust sensitivity (as measured by the DS-R) was

associated not only with more negative ratings of “gay men and lesbians” and “pro-gay activists,” but also with more negative ratings of other groups that participants rated as highly threatening to “traditional moral values about sex,” (i.e., “young people who are sexually active,” “pro-choice activists,” and “feminists”). In addition, the degree to which social groups were rated as threatening or upholding sexual morality predicted the relationship between disgust sensitivity and evaluations of that group. Specifically, individuals higher in disgust sensitivity liked sexual morality-threatening groups less, but liked sexual morality-upholding groups (e.g., pro-life activists) more. This suggests that rather than resulting from specific features of certain groups (e.g., gay men, transgender women) the relationship between disgust sensitivity and evaluations of sexual minorities results from their association with sex in general, and thus their perceived threat to traditional sexual morality. While this study looked at participants from the US, there is evidence for a similar pattern worldwide in an unpublished analysis (van Leeuwen et al., 2021) of data originally collected by Tybur et al. (2016) from respondents in 31 countries. This dataset contained feeling thermometer ratings of gay men, lesbians, and three groups associated with sexual promiscuity and/or threats to traditional morality: atheists, prostitutes, and sexually promiscuous people. Across the 31 countries, disgust sensitivity (as measured by the TDDS pathogen subscale) was modestly but reliably associated with more negative ratings of gay men (male participants: $r = .10$, female participants: $r = .08$), and lesbians (male participants: $r = .07$, female participants: $r = .11$). However, the relationship between disgust sensitivity and ratings of other sexual morality-threatening groups was of a similar magnitude ($r_s = .07-.15$).

Decomposition analyses (Kohler et al., 2011) showed that once the relationship between disgust sensitivity and other groups was accounted for, the remaining relationship between disgust sensitivity and ratings of gay men/lesbians did not significantly differ from zero. Again, this

suggests that the relationship between disgust sensitivity and evaluations of gay men and lesbians is due to their association with non-normative sex, and thus their perceived threat to traditional sexual morality.

Some researchers have even proposed that sexual conservatism might be the key component of traditionalism that explains the relationship between disgust sensitivity and political ideology (Tybur et al., 2015a). This is a more specific version of the pathogen-avoidance account outlined above, in that *sexual* traditionalism specifically is hypothesized to be the mediating variable between disgust sensitivity and overall ideology. In the research that first documented a relationship between disgust sensitivity and ideology, Inbar et al. (2009) also asked participants about a range of political issues and found that disgust sensitivity correlated with more conservative positions on gay marriage and abortion but not with positions on other issues including affirmative action, gun control, or the death penalty (disgust sensitivity did correlate significantly with greater support for tax cuts, but given the other evidence we discuss this may be a false-positive). When controlling for the indirect path between disgust sensitivity, gay marriage and abortion attitudes, and overall ideology, the direct path between disgust sensitivity and overall ideology was no longer significant. The same idea was tested more systematically by Tybur et al. (2015a), who examined sexual restrictiveness (i.e., a preference for monogamy and aversion to sexual promiscuity). Using a path modeling approach and a variety of measures of disgust sensitivity, sexual restrictiveness, and conservatism, the authors found that once the indirect path between disgust sensitivity and conservatism via sexual restrictiveness was accounted for, the direct path from disgust sensitivity to conservatism did not differ significantly from zero. In other words, the relationship between disgust sensitivity and general conservatism was entirely accounted for by the relationship both had with sexually conservative beliefs.

Likewise, Billingsley et al. (2018) found that sexual conservatism statistically explained the relationship between disgust sensitivity and voting intentions in the 2016 US Presidential election.

However, in our view, it is too early to close the book on a broader relationship between disgust sensitivity and political beliefs. Shook et al. (2015) reported a study in which the direct path between disgust sensitivity and conservatism remained significant when controlling for sexual conservatism (but see Tybur et al., 2015b). Furthermore, researchers have reported associations between disgust sensitivity and evaluations of other groups that seem unlikely to result from shared variance with sexual conservatism.

5.2.3 Immigrants and Foreigners

There is consistent evidence linking disgust sensitivity and anti-immigrant sentiment, although effect sizes are generally small to moderate. For example, in a sample of Canadian undergraduates, Hodson and Costello (2007) found that disgust sensitivity (as measured by the Disgust Scale 2) was related to more anti-immigrant beliefs ($r = .25$) as measured by a version of the Modern Racism Scale (McConahay et al., 1981) adapted to measure anti-immigrant beliefs (e.g. “Immigrants are getting too demanding in their push for equal rights”). In a sample of American adults, Crawford et al. (2014) found that disgust sensitivity (as measured by the DS-R) was related to more negative feeling thermometer ratings of illegal immigrants ($r = -.19$). Using a community sample in the Netherlands, Brenner and Inbar (2015) found that disgust sensitivity (as measured by the DS-R) was related ($r = .15$) to more anti-immigrant sentiment using a 10-item set of statements related to immigration and Islam (immigrants to the Netherlands tend to be Muslim); e.g., “Immigrants are a threat to our society,” “There are too many immigrants in the Netherlands, so sometimes I feel strange in my own country.”

Though they are consistent, the generalizability of these results is hampered by the fact that researchers relied on non-representative convenience samples. Aarøe et al. (2017) addressed this shortcoming in two studies using nationally-representative samples in Denmark and the United States. In these studies, scores on the five-item contamination subscale of the DS-R (Studies 1 and 2) were associated with anti-immigrant sentiment as assessed by a six-item scale created by the researchers (for example “Immigrants improve American [Danish] society by bringing in new ideas and cultures”). In a separate (non-representative) sample of Americans, this relationship held when measuring disgust sensitivity using the pathogen subscale of the TDDS. These relationships were small ($bs .10-.13$) but reliable even when controlling for demographic variables including age, gender, income, and race, as well as the “Big Five” personality factors. Finally, the authors also included a study using a Danish undergraduate sample in which disgust sensitivity was measured physiologically by measuring skin conductance response (SCR) when viewing six disgusting images. Higher SCR when viewing these images was again associated ($r = .24$) with higher anti-immigrant sentiment on the same six-item scale.

In a set of studies that directly tested the role of sexual conservatism, Ji et al. (2019) found that disgust sensitivity (as measured by the TDDS pathogen subscale) was associated with lower comfort with immigrants and greater likelihood of opposing their settling in the participant’s community. These relationships largely held when controlling for sexual conservatism as measured by the TDDS sexual disgust subscale, particularly for immigrants said to come from Liberia (which at the time was suffering from an Ebola outbreak).

There are at least two reasons that disgust sensitivity might be related to discomfort with immigration and immigrants. The first is the hypothesis we outlined in Section 5.1.3, that foreign (i.e., unfamiliar) groups heuristically pose a greater disease threat, because they may carry

pathogens from unfamiliar ecologies (Fincher & Thornhill, 2012; Thornhill et al., 2009), and that more disgust-sensitive people are reacting to this perceived threat. Another possibility is that immigrants are seen as threatening traditional norms and values (i.e., if they are seen as not assimilating and instead adhering to a different set of cultural norms), which are supported more by people who are more disgust sensitive. Indeed, questionnaire items such as “Immigrants improve society by bringing in new ideas and cultures” or “Immigrants are a threat to our society” (Aarøe et al., 2017; Brenner & Inbar, 2015) explicitly focus on threats to traditional norms and values. This reasoning would suggest that disgust sensitivity should predict negativity towards immigrants that do not assimilate to the local culture more so than towards those who do.

This question was tested by Karinen et al. (2019), who examined whether the relationship between disgust sensitivity and anti-immigrant sentiment is moderated by whether immigrants are seen as assimilating to the host country’s culture. In this study, the authors presented American participants with a scenario describing an immigrant who either assimilated to local (American) norms or did not. In addition, he was also described as having either high or low contact with native-born Americans. Disgust sensitivity (as measured by the TDDS pathogen scale) was related to greater anti-immigrant sentiment when the immigrant was described as not assimilating but was unrelated to anti-immigrant sentiment when he was described as assimilating. Level of contact (high or low) between the immigrant and native-born Americans did not moderate the relationship between disgust sensitivity and anti-immigrant sentiment. These results suggest that when disgust sensitivity is related to negativity towards immigrants and immigration, it is because immigrants are seen as threatening traditional norms by not assimilating, and not because immigrants are seen as intrinsic pathogen risks (if this were the

case, more contact ought to have resulted in a stronger relationship between disgust sensitivity and anti-immigrant sentiment).

Some apparently contradictory findings were reported by Aarøe et al. (2017), who found that describing a hypothetical immigrant as willing to learn English and committed to democracy and equal rights (vs. not) did not moderate the relationship between disgust sensitivity and negativity towards him. Karinen et al. (2019) suggest that the specific norms to which immigrants are assimilating may be important, and that the relationship between disgust sensitivity and anti-immigrant sentiment may be moderated specifically by perceived adherence to disgust-relevant social norms of food, sex, and hygiene.

5.2.4 Disease-Associated Groups

There is some research showing relationships between disgust and evaluations of social groups that appear visually non-normative, such as disabled or obese people. The theoretical explanation for this relationship is that unusual physical appearance is an intuitive disease cue, even if people know explicitly that most unusual-looking people (e.g., burn victims or amputees) pose no communicable disease risk. As disgust sensitive people are more attuned to pathogen cues, they may respond negatively to these cues even if they are invalid. Along these lines, Park et al. (2003) reported that among East Asian undergraduate participants in Canada, those who were more disgust sensitive (as measured by a version of the original Disgust Scale that underwent unspecified revisions) had stronger implicit associations between disability and disease. However, this result did not replicate in participants of European descent, and the decision to split the sample between East Asian and European participants may have been post-hoc.

In another set of studies, Lieberman et al. (2012) found that disgust sensitivity as measured by the TDDS pathogen scale was associated with more negative evaluations of obese people, but only among women. Similarly, Park et al. (2007) found a relationship between negative evaluations of obese people and germ aversion, a subscale of the Perceived Vulnerability to Disease scale that taps concerns about contamination and contagion (e.g., “I’m comfortable sharing a water bottle with a friend;” “I don’t like to write with a pencil someone else obviously chewed on.”). The authors did not say whether they tested for moderation by participant gender (the sample was 73%—209/286—women).

While suggestive, our assessment is that, at present, these results do not provide enough evidence for the hypothesized relationship between disgust sensitivity and evaluations of disabled or obese people. The strongest evidence for a relationship between disgust sensitivity and evaluations of disease-associated groups is for the homeless, who are often associated with pathogen cues (Clifford & Piston, 2017). In a national sample of 861 Americans surveyed as part of the 2014 Cooperative Congressional Election Study, the researchers found that more disgust-sensitive respondents were more supportive of policies excluding the homeless from public life (i.e., bans on panhandling and sleeping in public), especially when they had read a paragraph about homeless people that emphasized disgust cues (e.g., public urination and littering). There was, however, no relationship between disgust sensitivity and support for policies *helping* the homeless (e.g., subsidized housing). Thus, the relationship with disgust sensitivity was specific to policies that would minimize contact with homeless individuals.

5.2.5 Technology Evaluations

Disgust sensitivity has also been linked to evaluations of technologies that do not involve clear pathogen threats. Several investigations have found that disgust sensitivity is associated

with greater opposition to GE (genetically engineered) food (Clifford & Wendell, 2016; Scott et al., 2016). This could be because people higher in disgust sensitivity dislike genetic engineering in general (perhaps because, consistent with the extended disgust account, it is seen as impure or unnatural). It is also possible that they are simply more wary of novel foods in general (this is consistent with both the extended and pathogen-avoidance accounts, as one of disgust's primary functions is to discourage oral incorporation of harmful substances). It seems that the balance of the evidence favors the latter possibility. First, higher disgust sensitivity is also associated with greater wariness of other novel foods, such as lab-grown meat (Wilks et al., 2019), as well as with general food neophobia (Al-Shawaf et al., 2015). Second, Halstead and Lewis (2020) found that greater disgust sensitivity (as measured by the DS-R and the TDDS Pathogen subscale) was associated with opposition to GE food but with greater *support* of genetic engineering of humans, either to cure diseases or to enhance attributes such as strength or attractiveness. This was the case even when controlling for general risk aversion and neuroticism, along with individual differences including age, gender, race, education, and political ideology. Both these findings are more consistent with a link between disgust sensitivity and wariness of novel foods than with a more general dislike of genetic engineering by the disgust sensitive.

There is also some mixed evidence on the relationship between disgust sensitivity and vaccine opposition. Clifford and Wendell (2016) found an association between disgust sensitivity (as measured by the TDDS pathogen subscale) and anti-vaccine beliefs, although this was somewhat inconsistent across studies (the relationship between disgust sensitivity and vaccine negativity was significant in two studies but non-significant in another). Subsequently, other researchers have found small to moderate but significant relationships between vaccine negativity or hesitancy and disgust sensitivity (Clay, 2017; Kempthorne & Terrizzi, 2021;

Reuben et al., 2020), although some have also reported null relationships (Halstead & Lewis, 2020).

One possibility is that more disgust sensitive people may be more attuned to risks in general. As vaccine hesitancy is often assessed by asking about risks (e.g., risks of autism or long-term health consequences; Clifford & Wendell, 2016), a relationship between disgust sensitivity and vaccine hesitancy may be a specific example of this more general tendency. In an unpublished paper, Kahan and Hilgard (2016) asked people how much risk they thought each of a number of hazards posed to “human health, safety, or prosperity.” They found that disgust sensitivity (as measured by the TDDS pathogen subscale) was associated with greater risk perceptions for vaccines ($r = .17$) but also with greater risk perceptions for many other hazards including carjackings ($r = .31$), mass shootings ($r = .30$) and elevator crashes in high-rise buildings ($r = .28$). Likewise, Karg et al. (2019) found that disgust sensitivity (as measured by the DS-R) was associated with a broad measure of risk perceptions (Weber et al, 2002) in multiple studies (r s ranged from .30 to .40).

If more disgust-sensitive people are more attuned to risk in general, they should also be more attuned to disease risks (which one would expect to be associated with more *positive* evaluations of vaccines). Some evidence consistent with this idea is reported by Luz et al. (2019), who used a path model to examine the relationships between disgust sensitivity, vaccine evaluations, and flu vaccine uptake (this was a self-reported binary variable: whether the respondent got a flu vaccine in the 2016 flu season). There was a significant indirect negative path between disgust sensitivity (as measured by the DS-R), vaccine evaluations, and flu vaccine uptake: Disgust sensitivity predicted greater vaccine negativity, which in turn predicted a lower probability of having received the flu vaccine. However, once this indirect path was modeled, the remaining *direct*

path between disgust and vaccination was positive—that is, more disgust sensitive people were more likely to have been vaccinated.

5.3 Disgust and Social Judgments: Summary

Overall, there is consistent evidence for a relationship between disgust sensitivity and overall political ideology, evaluations of sexual minorities, and evaluations of immigrants and foreigners. The evidence when it comes to *induced* disgust is narrower. There is reasonably strong evidence that induced disgust causes more negative evaluations of gay men and lesbians, but the evidence when it comes to other groups is much less convincing. The simplest explanation for this is that induced disgust will shift judgments when the target of judgment evokes core disgust elicitors. Sex intrinsically entails core disgust elicitors, including close contact with others and exposure to their body products (Tybur et al., 2015a), and therefore judgments of groups defined by their sexual practices are affected by induced disgust. In terms of the analogy to chronic vs. induced thirst we proposed in Section 3.3, evaluations of sexual minorities are like desire for a glass of water: they are affected both by temporary changes in state and by trait differences. Other social beliefs and values—for example, overall political ideology or anti-immigrant sentiment—seem to be more like support for social thirst-reduction initiatives: they are the product of a longer and less direct causal chain, which means that they will not be affected by disgust inductions even though they are associated with individual differences in disgust sensitivity. Indeed, a recent registered report failed to find any effect of induced disgust on self-reported political ideology in two studies (Shook & Oosterhoff, 2020).

The most plausible intervening variable between disgust sensitivity and broader ideological commitments is social traditionalism—support for traditional cultural values. Most plausibly, the relationship between disgust and social traditionalism is the result of the pathogen-mitigating

functions of some traditional values, which leads more disgust-sensitive individuals to find them more appealing. Adhering to traditional values, then, has downstream consequences including greater general conservatism, dislike of immigrant groups seen as threatening traditional cultural norms, and dislike of groups seen as threatening sexual morality.

If this view of the distinction between induced disgust and disgust sensitivity is correct, it has some interesting implications. The first is that induced disgust ought to shift attitudes towards other groups associated with primary disgust elicitors. For example, if a particular immigrant group is described as eating unusual foods or as violating cultural standards of hygiene, disgust inductions should lead to more negative evaluations of that group. The second implication is that the relationship between disgust sensitivity and evaluations of sexual minorities is over-determined, in that it is a product of both the association of sexual minorities with primary disgust elicitors and the fact that they are seen as threatening sexual morality. In theory, these two paths could be distinguished empirically by varying these characteristics experimentally, or by measuring and modeling each proposed path.

Finally, how are we to interpret the association between disgust sensitivity and evaluations of specific technologies? We believe that the most straightforward explanation is that more disgust-sensitive people are more reluctant to consume novel foods (consistent with avoidance of dangerous foods as one of the core functions of disgust) and are also generally more risk-averse. This suggests that researchers should be wary of over-interpreting a relationship between disgust sensitivity and evaluations of a specific technology, as this could simply be a consequence of greater general risk aversion. Ideally, researchers would control for risk aversion when studying the relationship between disgust and science and technology evaluations. Another possibility is

to compare the size of the relationship between disgust sensitivity and evaluations of the focal technology to evaluations of technologies that theoretically should not be related to disgust.

6. Pathogen-Avoidance and Extended Perspectives on Disgust: Assessing the Evidence

We began by describing two perspectives on how disgust might affect social judgments. The *pathogen-avoidance* perspective sees disgust as an emotion that motivates the avoidance of objects or entities that are likely to pose a risk of physical contamination. The *extended* perspective sees disgust as having expanded its functional domain beyond this, to many intra- and inter-personal challenges: mate selection, coordinating moral condemnation, managing one's fear of death, maintaining intergroup boundaries and hierarchies, guarding spiritual and physical purity, and more. We first described some preliminary evidence for and against these two perspectives, but one of the major goals of this chapter was to evaluate the empirical findings on the relationship between disgust and social judgment to see which perspective better fit the data.

We think that although the data are not perfectly consistent in their support of one perspective over the other, the general pattern is quite clear: The predictions generated by the extended account of disgust are the least likely to have robust support. This is particularly true of the many studies in moral psychology that aimed to show that incidental manipulations of disgust (that were independent of the judgment being made by participants) played a role in social and moral judgments regarding actions, individuals, or groups of people that were not also, to some degree, relevant to the pathogen-avoidance goals of core disgust. So, for example, there is simply not strong evidence that inducing disgust causes changes in moral judgment writ large (i.e., for moral violations that do not involve core pathogenic disgust elicitors). One explanation is that it is simply hard to induce disgust in a way that carries over to subsequent unrelated judgments. After all, this requires that the disgust induction is strong enough to change

emotional states but also that participants misattribute some of their felt disgust to the focal judgment. However, there *do* seem to be reliable effects of induced disgust on evaluations of gay men and lesbians.

We do not want to overstate the case. There are relatively few studies showing this relationship, none of which were pre-registered, so it may be that later replication attempts do not find the same results. And there is not consistent evidence that induced disgust shifts evaluations of immigrants and foreigners, who some theorists have argued are associated with pathogen risks. However, for now it seems the strongest evidence for any effects of induced disgust is for evaluations of groups strongly associated with sex, which is inherently a pathogen-risky endeavor. This general pattern is also true of the correlational evidence. There is no strong evidence that disgust sensitivity is associated with greater moral harshness above and beyond its associated with generally harsher judgments of even non-moral actions. There *is* convincing evidence that disgust sensitivity is associated specifically with moral violations with pathogen content, and—consistent with the experimental evidence—with evaluations of sexual minorities.

There is an ambiguity in some extended-disgust theorizing on the relationship between disgust and moral judgment that can make the evidence for it seem stronger than it is. One possible way to interpret the extended-disgust perspective is that it predicts that disgust ought to influence moral judgments in general; that disgust has expanded to become an emotion that serves to regulate the behavior of others in what is best described as the moral domain. We believe there is insufficient evidence for this claim—there seem to be many cases in which disgust (either as an experimental induction or as an individual difference) seems to play no special role in moral judgment. Perhaps the more defensible interpretation of the expanded view is that disgust is only relevant for moral judgments of actions that violate some notion of

“purity.” However, we believe that this approach is problematic for different reasons. The term “purity” has been used in so many ways that it is hard to pin down exactly what this approach ought to predict. Researchers have at various times described as purity violations: sibling incest; sexual promiscuity; other weird sexual acts with no apparently direct harm (sex with chickens or with teddy bears on grandma’s bed); keeping an untidy and dirty living space; purposefully wearing unmatched clothing; consuming drugs, alcohol, tobacco, meat, or foods deemed to be “unclean”; smearing cat feces on your arm; drinking spoiled milk; giving a homeless person a moldy sandwich; and a widow wearing jewelry too soon after her husband’s death. Many acts that are described as purity violations do in fact involve pathogen threats (e.g., sexual behaviors, eating bad/rotten food, touching feces); others do not (e.g., wearing unmatched clothing or prematurely wearing jewelry); still others may or may not (e.g., keeping an untidy living space or recreational drug use).

One consequence of labeling such a heterogeneous set of behaviors as purity violations is that researchers sometimes include pathogen-relevant violations within a set of broader non-pathogen-relevant violations, and collapse these into the category of “purity violations.” If disgust is shown to influence these, they can point to their findings as evidence that disgust has come to shape not just the avoidance of pathogens, but to violations of moral purity. This, in turn, helps bolster the expanded view that disgust has become co-opted in the service of sociomoral regulation. More research is needed here, but to the extent that researchers have systematically separated pathogen-relevant content from these moral scenarios, it has become evident that disgust does not play the role predicted by the expanded account (e.g., Kollareth & Russell, 2019; Oaten et al., 2018).

The relationship between disgust sensitivity and a variety of social beliefs and values—beliefs about immigration, social traditionalism, and overall political ideology, among others—might seem to support the extended-disgust perspective. The choice between a right-wing vs. left-wing political party, for example, usually does not involve pathogen threats. However, there is convincing evidence that these attitudes and ideologies are downstream of reactions to pathogen threats, and that social traditionalism—which seems to be the intervening variable between disgust sensitivity and a broad range of attitudes—can be a cultural adaptation to pathogen threats in the environment (see Schaller, 2014). So, like the research on purity violations, this research is less supportive of the extended-disgust perspective than it might at first seem.

A general challenge for the extended-disgust perspective is discriminant validity. Because the extended-disgust perspective predicts broad relationships between disgust and judgment, researchers must be careful to establish both that relationships exist where they should, but also that they don't where they should not. We have reviewed several cases in which not doing this would have made the evidence for the extended-disgust perspective look stronger than it is. For example, greater disgust sensitivity is associated with harsher judgments of many kinds of moral violations, which seemingly supports the extended-disgust perspective, but it is also associated just as strongly with harsher judgments of non-moral stimuli (Landy & Piazza, 2019). Likewise, disgust sensitivity is associated with greater perceived risks of vaccination, but also greater perceived risks associated with many other hazards including carjackings and elevator accidents (Kahan & Hilgard, 2016). This is just as much a concern with experimental studies as correlational ones. Induced disgust does not seem to reliably affect moral judgment, but if replicable effects were to be found, researchers would need to ensure that they were the

result of disgust specifically, rather than of negative affect. The same problem applies to judgments of social groups (where some researchers have in fact contrasted disgust with other negative emotions, see Dasgupta et al., 2009), or, indeed, to any other social judgment.

Conversely, an advantage of the pathogen-avoidance account is its specificity; it not only seems to be able to provide a satisfactory explanation for the observed effects of disgust on judgment, but also of the *absence* of reliable effects for some targets. Indeed, the pathogen-avoidance perspective makes a clear set of predictions regarding what sorts of judgments ought to be influenced by disgust. For instance:

1. Groups that are either defined by acts that pose pathogen risks, or groups for which pathogen-risky behaviors are made salient in a study, should be more likely to be judged more harshly by individuals who are disgusted or individuals who are high in disgust sensitivity.
2. Social or moral norm violations that involve pathogen risks should be judged more negatively (and perhaps as more immoral, if they are viewed as a moral violation to begin with) by more disgust-sensitive people, and by people who are induced to feel temporarily disgusted. Induced and dispositional disgust should likewise correlate with seeing individuals who engage in pathogenic norm violations as worse people, with greater blame, and (within the constraints of societal norms) with harsher punishment of these individuals.
3. “Purity” violations as a category should not be responsive to dispositional or induced disgust, unless, again, those violations contain some element of pathogen risk. The use of these terms, however, sometimes includes acts that do not involve

pathogenic risks of any kind (such as some violations of honor). For violations of these acts, we should see disgust play a much smaller role (if any) in influencing evaluations.

4. More disgust-sensitive people, and those who are temporarily disgusted, ought to object more to social practices or policies that are heuristically associated with pathogen risks. One example is drinking purified wastewater, which does draw greater objections from the disgust sensitive (Rozin et al., 2015). There are many practices, from fecal transplants to eating horse meat, that we would expect to be similarly affected.
5. Disgust sensitivity and induced disgust should diverge in their effects when the judgment in question does not directly concern pathogen threats but is instead the result of a longer causal chain—for example, when disgust sensitivity is associated with political ideology via social traditionalism. In these cases, we would expect no effect of induced disgust (which is what the evidence generally shows). In terms of the analogy we proposed earlier, making people thirsty should not increase support for a political party that, among other things, supports more public drinking fountains.

We emphasize that these are just hypotheses (although some do have some evidence for them). We propose them not because we think that they are all necessarily true, but because they seem to be the sort of tests that would be most informative in further adjudicating between the different perspectives on disgust.

6.1 Conclusion

We have described two very different perspectives on disgust that posit very different explanations for its role in social judgments. In our view, the evidence currently supports the pathogen-avoidance account over the extended-disgust alternative, but the question is best settled by future research explicitly designed to differentiate the two perspectives.

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Table 1

Comparing the pathogen-avoidance and extended perspectives on the relationship between disgust and social judgments.

Disgust	<i>Pathogen-avoidance perspective</i>	<i>Extended disgust perspective</i>
Core domain	Disease avoidance	Many social threats and challenges (symbolic or concrete)
Primary elicitors	Pathogen threats	Pathogen threats, reminders of animal nature, moral violations, inappropriate sexual partners
Influence on social judgments	Only when pathogen threats are involved	For many social/moral norm violations
Origins	Pathogen-avoidance adaptations	Preadaptation of (oral) pathogen-avoidance response

Table 2

Summary of reviewed research on relationships between induced disgust or disgust sensitivity and social judgment.

Effects of Induced Disgust on Moral Judgment	
<u>Citation</u>	<u>Primary Finding(s)</u>
Białek et al., 2021	Exposure to a noxious odor did not affect moral judgments in two experiments, and self-reported disgust had inconsistent relationships with moral judgments across the two studies.
Cameron et al., 2013	Exposure to disgusting images did not affect moral judgments, except for those chronically (Study 1) or situationally (Study 2) lower in “emotion differentiation,” for whom viewing disgusting images caused harsher moral judgments.
Eskine et al., 2011	Tasting a bitter drink caused harsher moral judgments compared to tasting a sweet or neutral drink.
Ghelfi et al., 2020	A large-scale ($n = 1,137$) replication of Eskine et al., (2011) that found no reliable effect of bitter vs. sweet vs. neutral drink on moral judgments.
Horberg et al., 2009	Viewing a disgusting film clip (vs. a sad clip) caused greater condemnation of purity-related moral violations and greater praise of purity-related moral virtues. There was no effect for judgments of non-purity violations/virtues.
Johnson et al., 2016	Recalling and writing about a disgusting experience (vs. recalling and writing about the events of the previous day in Study 1 and no recall task in Study 2) did not cause harsher moral judgments overall. There was also no moderation of the disgust manipulation by individual differences in “private body consciousness.”
Jylkkä et al., 2021	Viewing disgusting images (Study 1) and film clips (Study 2) did not cause harsher moral judgments (vs. neutral images/clips).
Landy & Goodwin, 2015	Meta-analysis of 50 experiments inducing disgust and measuring moral judgments. Overall, there is a small effect of disgust ($d = .11$) which is not significantly different from

	zero ($d = -.01$) after statistically correcting for publication bias.
Sanyal et al., 2021	Viewing disgusting (vs. frightening or neutral) images caused slightly more negative evaluations of some biotechnologies, but this effect was not significant after correcting for multiple comparisons.
Sato & Sugiura, 2014	Writing about a disgusting (vs. neutral) experience made moral judgments more severe only for participants who scored low on the “acting with awareness” subscale of the Five Facet Mindfulness Questionnaire.
Schnall et al., 2008	Exposure to a disgusting odor (vs. no odor; Study 1), sitting at a messy desk (vs. a clean desk; Study 2), writing about a disgusting experience (vs. no writing; Study 3), and watching a disgusting film clip; vs. sad or neutral clips; Study 4) led to harsher moral judgments. In Study 1, this was true for all participants, in Studies 2-4, it was true only for those dispositionally high in “private body consciousness.”
van Dijke et al., 2018	Two of the studies in this paper were experimental (Studies 2 and 4). In Study 2, imagining and writing about a disgusting situation (vs. a no-task control) did not affect moral judgments overall, but did interact with (manipulated) psychological distance from a moral violation only for purity-related moral judgments, such that the disgust induction caused harsher moral judgments only for psychologically distant purity-related violations. In Study 4, imagining and writing about a disgusting situation (vs. a no-task control) led to harsher purity-related moral judgments (but not harsher non-purity moral judgments), but this was not moderated by psychological distance.
van Dillen et al., 2012	One study in this paper compared induced disgust to a control condition (Study 1). In this study, reading disgusting sentences (vs. control sentences) caused harsher moral judgements of a hypothetical moral violation (keeping a lost wallet). In the disgust condition (but not the control condition), participants who were lower in attentional

	control as measured by performance on a Stroop task gave harsher moral judgments.
Wheatley & Haidt, 2005	A post-hypnotic suggestion to “feel a sickening feeling” when reading a “trigger” word (either “take” or “often”) caused harsher moral judgments when scenarios contained the trigger word in two studies.
Relationships Between Disgust Sensitivity and Moral Judgment	
<u>Citation</u>	<u>Primary Finding(s)</u>
Chapman & Anderson, 2014	Two studies showed that individuals dispositionally high in disgust sensitivity rated moral and conventional violations as more wrong than individuals low in disgust sensitivity, even when controlling for social conservatism, trait anger, and trait anxiety.
Horberg et al., 2009	In Study 3, trait disgust (but not trait anger or fear) predicted greater punishment for purity violations, and praise for purity virtues.
Jones & Fitness, 2008	In one study, mock jurors higher in disgust sensitivity were more likely to favor conviction of a fictitious defendant. In another study, disgust sensitivity predicted judgments of culpability for crimes, longer prison sentences, and greater perceptions of crime in the community.
Karinen & Chapman, 2019	A meta-analysis of six studies showing a positive relationship between disgust sensitivity and condemnation of nonpurity (i.e., harm) transgressions.
Landy & Piazza, 2019	In four studies, disgust sensitivity was associated with harsher judgments of moral and conventional violations, as well as imprudent actions. Disgust sensitivity was also associated with competence judgments, aesthetic evaluations, and praise for positive moral acts.
Wagemans et al., 2018	In five studies, disgust sensitivity was more strongly correlated with moral condemnation of purity violations than with condemnation of transgressions in other moral domains.
Effects of Induced Disgust on Social Judgments	
<u>Citation</u>	<u>Primary Finding(s)</u>
Buckels & Trapnell, 2013	Induced disgust (via IAPS pictures) caused relatively stronger implicit associations between minimal outgroups and animals vs.

	minimal ingroups and humans, compared to induced sadness and neutral control groups.
Cunningham et al., 2013	Disgust induced with odor manipulations led to less positive evaluations of gay men and lesbians on a feeling thermometer.
Dasgupta et al., 2009	In Study 1, anger and disgust (induced via autobiographical recall) caused more positive implicit associations to minimal ingroups vs. outgroups. In Study 2, disgust (induced via autobiographical recall) increased implicit bias against outgroups associated with disgust (e.g., homosexuals), but anger did not. In Study 3, induced anger (but not disgust) increased implicit bias against outgroups associated with anger (e.g., Arabs).
Faulkner et al., 2004	In two experiments, manipulating disease salience led to less positive attitudes toward foreign (but not familiar) immigrants and to greater endorsement of policies that would favor immigration of familiar vs. foreign people. However, it did not affect ratings of immigrants on many other evaluative attributes.
Inbar et al., 2011	Disgust induced with odor manipulation led to less positive evaluations of gay men (but not other social groups) on a feeling thermometer.
Ji et al., 2019	Across four studies, pathogen primes did not cause more negative evaluations of immigrants (although individual differences in pathogen disgust sensitivity were related to these evaluations).
Kiss et al., 2020	A meta-analysis of 17 studies found a moderate effect of disgust sensitivity on evaluations of gay men, and a large effect of induced disgust on evaluations of gay men.
Navarrete and Fessler, 2006	Participants who completed a disgust sensitivity scale as a disgust induction reported greater in-group favoritism (but not out-group derogation).
Shook & Oosterhoff, 2020	In two studies, induced disgust (via reading a disgusting story) did not affect self-reported political ideology.
Relationships Between Disgust Sensitivity and Social Judgments	
<u>Citation</u>	<u>Primary Finding(s)</u>

Aarøe et al., 2017	In four samples, disgust sensitivity was associated with greater opposition to immigration. In one U.S. sample, this relationship held for Middle Eastern but not European immigrants.
Al-Shawaf et al., 2015	Disgust sensitivity was associated with general food neophobia (i.e., reluctance to consume novel foods).
Billingsley et al., 2018	Sexual disgust was associated with voting for Donald Trump and supporting the Republican party, but pathogen disgust was not related to these outcomes after controlling for pathogen disgust.
Brenner & Inbar, 2015	In two studies in the Netherlands, greater disgust sensitivity was associated with greater anti-immigrant sentiment, sexual conservatism, and voting for a socially conservative party.
Clay, 2017	In two studies, disgust sensitivity was associated with more negative attitudes towards vaccines.
Clifford & Piston, 2017	Disgust sensitivity was associated with greater support for policies excluding homeless people from everyday life (e.g., banning panhandling).
Clifford & Wendell, 2016	Disgust sensitivity was associated with opposition to genetically engineered food and anti-vaccination beliefs.
Crawford et al., 2014	Disgust sensitivity was associated with more negative evaluations of groups seen as threatening traditional sexual morality, and with more positive evaluations of groups seen as upholding traditional sexual morality.
Halstead & Lewis, 2020	Disgust sensitivity was associated with more opposition to GE food, but more <i>support</i> of gene editing in humans, both for treatment and enhancement.
Hodson & Costello, 2007	Interpersonal disgust sensitivity was associated with more negative evaluations of foreigners and low-status social groups as well as higher social dominance orientation and right-wing authoritarianism.
Inbar et al., 2012	Disgust sensitivity was associated with self-reported conservatism across 121 countries, and was associated (at the state level) with a

	higher vote share for John McCain over Barack Obama.
Inbar, Pizarro, & Bloom, 2009	Disgust sensitivity was associated with self-reported conservatism (Studies 1 and 2) and with more conservative positions on abortion and gay marriage (Study 2).
Inbar, Pizarro, Knobe, & Bloom, 2009	Disgust sensitivity was associated with rating encouraging same-sex couples to kiss in public as more intentional (Study 1), and with more negative implicit evaluations of gay men and lesbians (Study 2).
Ji et al., 2019	Disgust sensitivity was associated with lower comfort with immigrants specifically from pathogen-rich ecologies, and with lower support for allowing individuals to immigrate (regardless of their origin).
Kahan and Hilgard, 2016	Disgust sensitivity was associated with seeing vaccines and GE food as more risky, but also with higher risk judgments of other hazards (e.g., carjackings and elevator accidents).
Karg et al., 2019	In four studies, disgust sensitivity was associated with higher scores on the Domain-Specific Risk-Taking (DOSPERT) scale across five different risk domains.
Karinen et al., 2019	Disgust sensitivity was associated with anti-immigrant sentiment when an immigrant was described as not assimilating to US culture, but not when he was described as assimilating.
Kemphorne & Terrizzi, 2021	Disgust sensitivity was associated with anti-vaccination attitudes.
Kiss et al., 2020	In a meta-analysis, disgust sensitivity was associated with more negative evaluations of gay men and lesbians (58 effects; average effect size $r = .31$).
Lieberman et al., 2012	Disgust sensitivity was associated with more negative evaluations of obese people for women, but not men.
Luz et al., 2019	In a path model, the direct path between disgust sensitivity and self-reported flu vaccine uptake was positive, but the indirect effect via vaccine attitudes was negative.
Olatunji et al., 2008	Disgust sensitivity was associated with discomfort with interpersonal contact with gay people; this was partially mediated by sexual conservatism and religiosity.

Park et al., 2003	Disgust sensitivity was associated with stronger implicit associations between disability and disease for Asian (but not white) Canadian undergraduates.
Park et al., 2007	Germ aversion (as measured by a subscale of the Perceived Vulnerability to Disease scale) was associated with disliking obese people.
Scott et al., 2016	Disgust sensitivity was associated with greater opposition to genetically engineered food.
Shook et al., 2015	In a latent variable model, the direct path between pathogen avoidance and political conservatism was significantly positive even when accounting for the (positive and significant) indirect path via sexual strategies.
Tybur et al., 2010	In three studies, there was no relationship between disgust sensitivity and self-reported political ideology.
Tybur et al., 2015a	In three studies, restrictive sexual strategies fully mediated the relationship between disgust sensitivity and political conservatism.
Tybur et al., 2016	In 30 countries, disgust sensitivity was associated with higher traditionalism but not with higher social dominance orientation.
van Leeuwen et al., 2021	In 31 countries, disgust sensitivity was associated with greater negativity towards gay men and lesbians, but also to other groups associated with violations of traditional sexual norms.
Vanaman and Chapman, 2020	Disgust sensitivity was associated with greater support for policies restricting public bathroom access for transgender people.
Wilks et al., 2019	Disgust sensitivity was associated with opposition to lab-grown meat.