

## LITERATURE REVIEW

# On Disgust and Moral Judgments: A Review

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While there is a continuing debate on whether cognitive or emotional mechanisms underlie moral judgments, recent studies have illustrated that emotions, particularly disgust, play a prominent role in moral reasoning. This review explores the role of disgust in moral judgments. Three relevant claims are explored regarding their involvement in moral cognition and it is argued that the least appealing (i.e., disgust is just anger in disguise) is also the one with the least empirical support.

**Keywords:** disgust; moral judgments; emotions; cognition; morality

Research on moral judgments has typically focused on how people respond to moral dilemmas. A typical paradigm involves assessing how people evaluate various situations involving harm or justice (e.g., the trolley problem; Thomson, 1986) in order to reach a conclusion regarding the morality of a person or behavior (Björklund, 2004). Although most research conducted in the last century focused on reason as a basis for moral judgments, recent work has pointed towards emotions playing a dominant role in the way people make moral judgments. Most studies focused particularly on the emotion of disgust, claiming that it serves a substantial role in moral cognition. The aim of this review is to examine recent studies that have investigated the role of disgust in morality. Although not extensive, the present paper covers an array of issues concerning the role disgust may have in moral judgments. Three different forms of this claim are being differentiated and it is argued that the last claim, apart from being the least appealing, is the weakest of them all. The three forms are as follows: (a) disgust increases the severity of moral judgments, (b) individual differences in the propensity to experience disgust are connected with fluctuation in moral cognition, and (c) disgust cannot be differentiated from anger towards reporting moral transgressions.

### Disgust: Origin and Evolution

Disgust has been acknowledged as one of the six basic universal emotions in humans (Darwin, 1872; 1965). Like the other basic emotions, disgust has a specific facial expression (Ekman & Friesen, 1971; Izard, 1971), a specific behavior (e.g., holding oneself back from the object of disgust or dropping it; Rozin, Haidt, & McCauley, 1993), and specific physiological manifestations (e.g., lower blood

pressure, lower galvanic skin response, and nausea; Curtis & Biran, 2001).

Some researchers suggest that disgust has originated from distaste, a type of food-repudiation motivation or drive generated by the swallowing of unpalatable substances, typically bitter ones (Chapman, Kim, Susskind, & Anderson, 2009; Rozin & Fallon, 1987). Distaste is assumed to be the basis of food-connected disgust, which is the most elementary type of disgust (Rozin & Fallon, 1987). However, distaste differs from disgust in the sense that disgust is not as closely connected to the sensorial characteristics of the stimuli (e.g., one does not have to taste a cockroach in order to become disgusted by it; Rozin & Fallon, 1987). Furthermore, objects that are perceived to be disgusting elicit a more powerful offensive feeling and are also more contaminating than those that are considered to be distasteful (Rozin & Fallon, 1987; Rozin, Markwith, & McCauley, 1994).

Disgust has also been extended to stimuli other than elementary food-related ones (Rozin & Fallon, 1987). Among these are bodily products (e.g., faeces, greasy hair, blood), certain sexual actions (e.g., incest, bestiality), transgressions of bodily surfaces (e.g., injuries), and sickly individuals or those lacking hygiene (Curtis & Biran, 2001; Rozin, Haidt, & McCauley, 2008). This type of disgust has been conceptualized as physical disgust (Chapman & Anderson, 2012, 2013).

Furthermore, it has been shown that physical disgust also acts as a disease avoidant mechanism (Curtis, Aunger, & Rabie, 2004; Curtis & Biran, 2001; Oaten, Stevenson, & Case, 2009). Hence, this type of disgust has been conceptualized in the literature as pathogen disgust (Tybur, Lieberman, Kurzban, & DeScioli, 2013). Similarly to a broad series of species (e.g., roundworms, lizards, and chimpanzees), humans have developed certain protective physiological, cognitive, and behavioral adaptive features (Curtis, 2007; Kluger, Ringler, & Anver, 1975; Schaller & Duncan, 2007; Zhang, Lu, & Bargmann, 2005).

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Disgust as a Magnifier of Moral Judgments	Disgust Sensitivity or Disgust as a Personality Trait	Disgust is just Anger in Disguise
Eskine et al. (2011)	Björklund (2004)	Cannon et al. (2011)
Horberg et al. (2009)	David and Olatunji (2011)	Chapman et al. (2009)
Schnall et al. (2008)	Erlandsson (2012)	Horberg et al. (2009)
Ugazio et al. (2012)	Hodson and Costello (2007)	Hutcherson and Gross (2011)
Wheatley and Haidt (2005)	Horberg et al. (2009)	Rozin et al. (1999)
	Inbar et al. (2009)	Simpson et al. (2006)
	Jones and Fitness (2008)	Ugazio et al. (2012)

**Table 1:** Articles selected to assess each of the claims.

Accordingly, pathogen disgust can be considered as being such an adaptation and can thus play the role of a defense mechanism toward pathogen infection (Tybur et al., 2013). This type of disgust was conceptualized as either core disgust (Rozin et al., 2008), primary disgust (Marzillier & Davey, 2004), pure disgust (Zhong & Liljenquist, 2006), basic disgust (Chapman et al., 2009; Inbar, Pizarro, & Bloom, 2009), or theoretical disgust (Nabi, 2002).

Perhaps the most surprising evolved function of disgust has been identified in the social and moral realm, namely *moral disgust* (Chapman & Anderson, 2012; 2013). Furthermore, it is believed that it is only in humans that disgust plays a role in the dynamics of norms (Clark & Fessler, 2014). For example, the acts of stealing, lying, and fraud have been shown to induce subjective reports of disgust (e.g., Tybur, Lieberman, & Griskevicius, 2009). If the elicitors of disgust have been extended from physical stimuli to moral acts, this expansion would be then considered an important case of exaptation (Rozin et al., 2008). Exaptation is an evolutionary course by which a previous structure undertakes a function without altering its basic role (Bock, 1959; Mayr & Tax, 1960).

Thus, in humans, disgust is assumed to have extended from having its origins in distaste, then serving as a pathogen avoidance mechanism, and finally entering into the social and moral sphere. Given its expansion, from very concrete, non-social, and clear-cut functions of avoiding contaminated or toxic food, or disease, it surprising that disgust is a nominee for being a moral emotion (Rozin & Fallon, 1987; Rozin et al., 2008). As Chapman et al. (2009) argue, disgust could have changed its function to stimulate avoidance from transgressions or even from the idea of performing a transgression. Chapman et al. suggest that if disgust is triggered by abstract moral violations, then it supports the view that human morality relies on evolutionarily archaic antecedents. Furthermore, there has been a growing body of research agreeing that disgust plays a role in moral judgments. For instance, individuals report feeling disgusted as a reaction to acts deemed to be immoral (e.g., Rozin, Lowery, Imada, & Haidt, 1999). Their moral judgments are also more severe when experiencing the feeling of disgust (Wheatley & Haidt, 2005), and people are more prone to consider certain actions as being immoral if they have an inclination to be easily disgusted (Horberg, Oveis, Keltner, & Cohen, 2009;

Inbar, Pizarro, Knobe, & Bloom, 2009). The connection of disgust with moral judgments has substantial consequences for how we look at moral cognition (Chapman & Anderson, 2013).

Despite this, the view of disgust as a moral emotion and the role that it plays in moral judgments has been questioned and is up for debate. Arguments range from claims that disgust is evoked solely by transgressions that include physical disgust stimuli such as, for example, sexual crimes and bloody murders (Bloom, 2004; Oaten et al., 2009; Royzman & Sabini, 2001; Rozin et al., 1999) to arguments that the report of disgust is just metaphorical (e.g., Royzman & Sabini, 2001). However, there are many researchers who support the view that disgust plays a role in moral judgments. The present paper focuses on evaluating three of these main claims and argues that the least appealing is also the one with the least empirical support.

I begin my review by evaluating the claim that disgust increases the severity of moral judgments (i.e., magnifies the strength of individuals' judgments of moral transgressions; Claim 1). Secondly, I evaluate the claim that individual differences in the propensity to experience disgust are associated with fluctuation in moral cognition (Claim 2). Lastly, I review the case of whether disgust cannot be dissociated from anger towards reporting moral transgressions (Claim 3). I argue that while there is enough empirical evidence to support the first two claims, the third one is the most objectionable.

In reviewing the three claims, I conducted online searches of seven online databases—PsycARTICLES, Social Sciences Citation Index, Scopus®, JSTOR Life Sciences, MEDLINE, ScienceDirect, and PsycINFO. Two search terms were used: 'disgust' and 'moral judgment'. The search was limited to articles published in English between January 1, 1999 and December 31, 2012. In addition, reference lists of relevant literature were investigated to identify further studies that were suitable for the review. **Table 1** displays the articles that were selected for consideration in this paper.

### Claim 1: Disgust as a Magnifier of Moral Judgments

The first claim argues that disgust may have a special association with moral judgments in that manipulating disgust has a magnifying influence on moral judgments (i.e.,

rendering them more severe). To address this matter, a number of studies have investigated whether experimentally induced physical disgust can bias moral judgments by making them harsher. An important query here is whether the moral judgments influenced by physical disgust are judgments about a broad spectrum of moral topics or only about issues that include suggestions of physical disgust (Chapman & Anderson, 2013). It is important to note that physically disgusting transgressions will be conceptualized as those that contain factual stimuli; whereas pure transgressions will be conceptualized as those that contain abstract moral stimuli. If empirical evidence showing that inducing physical disgust could increase the severity of judgments about both physically disgusting and pure moral transgressions exists, the supposition of a specific effect of disgust would be strengthened. More precisely, if there is enough evidence to show that evoking physical disgust increases the severity of judgments not only about transgressors containing suggestions of physical disgust but also of those containing pure transgressions, then it could be even safer to assume that disgust *does* (more generally) increase the severity of moral judgments.

Wheatley and Haidt (2005), using posthypnotic suggestions of disgust to influence moral judgments, found that the aggravating effect of disgust on such judgments was present even when disgust was induced through suggestion, rather than physical sensation. Of the moral scenarios used, two were connected with physical disgust (e.g., eating one's dog) and the other four were not (e.g., accepting bribes, a lawyer described as 'ambulance chasing'). As a result, participants thought that the moral violations were more disgusting when the disgust word was present in the scenarios compared to when it was not. Furthermore, participants judged the violations as being worse when the disgust word was present (Wheatley & Haidt, 2005). Additionally, disgust did influence another non-moral judgment (e.g., a student council representative that often tries to select discussion topics that could attract the interest of both students and teachers) in the sense that participants judged the story as being both more disgusting and morally wrong. However, this study had one important limitation: the only emotion the authors investigated was disgust. Because no other emotions were examined, it cannot be concluded that there is a particular association between disgust and moral judgments when hypnosis is used (Wheatley & Haidt, 2005). However, the results indicate that evoking physical disgust may specifically influence moral judgments (i.e., rendering them more severe) and that physical disgust does increase the severity of judgments about physically disgusting transgressions, but also of those about pure transgressions.

Schnall, Haidt, Clore, and Jordan (2008) investigated how different ways of inducing disgust can influence moral judgments in an attempt to replicate, at a conceptual level, Wheatley and Haidt's (2005) study. Exposure to a bad smell, working in a disgusting room, remembering a physically disgusting experience, and watching a video depicting a disgusting situation all led to the disgust manipulation increasing participants' harshness of moral judgments compared to a control group (Schnall

et al., 2008). Moreover, participants' ratings did not differ between the disgusting moral transgressions and the non-disgusting ones (i.e., pure transgressions). Furthermore, the authors showed that the role disgust plays in increasing the severity of moral judgments was dependent on the participant's attunement to sensations from their own body as measured by the Private Body Consciousness subscale pertaining to the Body Consciousness Subscale (Miller, Murphy, & Buss, 1981). Results suggested that only disgust and not other negative emotion (sadness) had an influence on moral judgments. More precisely, they found that disgust, compared with sadness, had a much stronger link with making more severe moral judgments. And lastly, the findings also suggested that disgust did not influence non-moral judgments.

Ugazio, Lamm, and Singer (2011) however, were unsuccessful at replicating Schnall et al.'s (2008) results. More precisely, they attempted to investigate the influence of different emotions (disgust vs. anger) on different kinds of moral judgments. The different types of judgments were as follows: disgust-connected, belief, personal, and impersonal. Personal meant it was governed by social-emotional reactions (Greene, Nystrom, Engell, Darley, & Cohen, 2004) such as, for example, the trolley dilemma, where people were asked if they would throw a switch that would divert a runaway trolley on an alternative track where it would kill one person instead of five. On the other hand, impersonal was governed by more deliberate reactions (Greene et al., 2004) such as the footbridge dilemma where people have the option to push a fat man of a bridge over a runaway trolley in order to save five people standing on a track below (Thomson, 1986). Disgust was induced by positioning participants in a foul-smelling room or by watching a disgusting film, while anger was induced by obtaining false negative feedback on essays. The control groups either watched a neutral film or were given neutral feedback. This helped to show that the emotions induced did have an effect in the personal scenarios, but not in those scenarios concerning beliefs. Moreover, the emotions did influence moral judgments in the impersonal scenarios, but not in those connected with disgust. Nevertheless, as Chapman and Anderson (2013) pointed out, participants induced with disgust tended to judge utilitarian acts (i.e., killing a person in order to save five) harsher than those induced with anger or those in the control condition.

The above studies investigated the effect of incidental disgust on moral judgments. However, Eskine, Kacinik, and Prinz (2011) went even further into the sensorial origins of disgust and examined the influence of distaste. The authors reported that a bad taste in the mouth, which consequently induced physical feelings of disgust, was related to harsher moral judgments. Participants allocated to a bitter taste condition made more severe judgments about several moral scenarios (same as those used by Wheatley & Haidt, 2005). Eskine et al.'s (2011) study had important implications; they confirmed the specific impact (i.e., severity increasing) disgust has on moral judgments (both those about physically disgusting transgressions and non-disgusting transgressions) and, similar to Schnall et al.'s (2008) study, demonstrated the

role that sensory information might play in moral judgments. Furthermore, the results suggest that the connection between disgust and moral judgments expands to disgust's assumed sensorial roots in distaste (Chapman & Anderson, 2013).

Horberg et al. (2009; Study 2) provided evidence supporting the connection between disgust and moral judgments. In a similar manner to Schnall et al. (2008), participants viewed a film that included either a disgusting or a sad scene and afterwards judged the wrongness of transgressions concerning purity (e.g., purchasing music with lyrics that have sexual content) and harm/care (e.g., refusing to help a classmate with their lecture notes). The results suggested that participants induced with disgust tended to make stronger judgments of behaviors related to purity, but not those related to harm/care, than participants induced with sadness (Horberg et al., 2009). Even though the results have shown the more obvious effect of physical disgust in increasing the severity of physically disgusting violations, there was no such evidence when it came to pure violations. One viable explanation would be the fact that the aforementioned differences in individuals' adjustments to their body consciousness might need to be accounted for (Chapman & Anderson, 2013). More precisely, it could very well be that disgust might have had an effect on pure transgressions, but only for individuals with a higher private body consciousness. Physically disgusting violations might have been more easily influenced by disgust in a greater part of the population (Schnall et al., 2008).

In sum, there is valuable evidence for Claim 1, namely that disgust amplifies moral judgments—it causes wrongdoings to appear even more wrong. These findings could potentially sustain the broader argument that there is a causal connection between disgust and moral evaluations by showing that experimentally induced disgust can influence moral judgments (Chapman & Anderson, 2013). Furthermore, they strengthen the narrower, uni-directional, argument that disgust exerts a specific influence (i.e., severity increasing) on moral judgments.

One important issue here is whether physical disgust influences both physically disgusting and non-disgusting transgressions, or only those that include suggestions of physical disgust (Chapman & Anderson, 2013). While the latter is not a remarkable claim, some findings have shown that by inducing physical disgust both physically disgusting and pure transgression were judged more severely (e.g., Schnall et al., 2008; Wheatley & Haidt, 2005). Nevertheless, Horberg et al.'s (2009) study has failed to do so, thus suggesting conflicting results as to whether all violations are equally prone to the influence of disgust.

Furthermore, it is important to note that most of these studies included evaluations of moral transgressions, making it impossible to assume whether the influence of disgust is only in the realm of moral judgments, or also in judgments not connected to morality. The only notable exceptions are, as mentioned before, Schnall et al.'s (2008) and Wheatley and Haidt (2005). This is more thoroughly discussed in the final section.

## **Claim 2: Individual Differences: Disgust Sensitivity or Disgust as a Personality Trait is Related to Variations in Moral Judgments**

Thus far I have considered studies that manipulate disgust and assessed its specific impact (i.e., increasing severity) on moral judgments. A related line of research is that which considers disgust not merely as a state but as a trait termed disgust sensitivity. Disgust sensitivity is defined as a predisposition towards experiencing disgust (Olatunji & Sawchuk, 2005) and can be usually measured by the Disgust Scale (DS; Haidt, McCauley, & Rozin, 1994), and its German version, known as the Questionnaire for the Assessment of Disgust Sensitivity (QADS; Petrowski et al., 2010). In reviewing the relationship between disgust sensitivity and moral judgments, I will solely focus on studies concerned with a normal variation in disgust sensitivity and not with a pathological one since this is beyond the scope of the present review (see Chapman & Anderson, 2013 for an overview on pathological disgust sensitivity). It is important to note that this section will further be concerned with whether trait physical disgust is connected not only with violations that contain physical disgust suggestions, but also with pure transgressions.

Inbar et al. (2009) investigated the association between disgust sensitivity and a narrower range of moral judgments such as political attitudes and issues as well as issues regarding purity such as abortion and gay marriage. They found that the disgust sensitivity was positively associated with a higher self-reported political conservatism, and that this correlation appeared to be stronger when "socio-moral issues and gay marriage and abortion" were involved (Inbar et al., 2009, p. 721). However, they did not find such differences when it came to pure moral topics such as welfare or gun control. Furthermore, the authors reported that other potentially related variables (Fear of Death, Sensation Seeking and openness to experience) did not have any shared connection with the relationship between disgust sensitivity and conservatism. Thus, it can fairly be concluded that disgust sensitivity shares a unique relationship with political conservatism (Inbar et al., 2009).

A further study on disgust sensitivity conducted by Jones and Fitness (2008) found support for the relationship between this trait and moral judgments. After reading a fictitious copy of a murder trial, individuals with greater disgust sensitivity were more likely to give convictions. It is also important to specify the fact that neither of the manipulations contained suggestions of physical disgust. This might be an indication that the connection between disgust sensitivity and moral evaluations might also expand beyond the sphere of judgments about physically disgusting violations (Chapman & Anderson, 2013).

Furthermore, apart from self-reported political conservatism and hypothetical crime condemnation, interpersonal disgust sensitivity has been investigated in relation to attitudes towards out-groups such as immigrants, foreign ethnic groups, and groups with a low-status (Hodson & Costello, 2007). The results have yielded the finding that disgust sensitivity had an indirect effect on attitudes towards those out-groups. This effect was mediated by

social dominance orientation, right-wing authoritarianism, and dehumanization. Furthermore, the effect of social dominance orientation on those attitudes was both direct and indirect through dehumanization. One important and novel implication of the results is that they suggested that disgust sensitivity might also play a part in prejudice. More precisely, if out-groups are seen as disgusting, and there is a connection between disgust and morality, these out-groups might be seen as being morally doubtful (Chapman & Anderson, 2013). In accordance with the link between disgust and prejudice, the most extreme out-groups have also been identified to elicit lower levels of brain activation in the regions connected with person-processing (i.e., those associated with 'self' and 'other' judgments; Seger, Stone, & Keenan, 2004) and not only self-reported disgust (Harris & Fiske, 2006). As such, this might suggest that disgust may be connected with the process of dehumanization (Harris & Fiske, 2006; Hodson & Costello, 2007).

Björklund (2004) further showed how moral judgments were influenced by non-moral disgust. This relationship was connected to "individual differences in disgust sensitivity and preferred processing mode" (Björklund, 2004, p.1): Björklund noted that people with greater disgust sensitivity tended to make more severe moral judgments especially if they had lower self-reported systematic thinking. Furthermore, this relationship was strengthened when participants reported greater usage of intuitive thinking. However, as the author pointed out, this intertwining between intuition and level of processing depends on personal (e.g., motivation) and situational factors (e.g., time pressure), and this becomes even more complicated when individual differences are taken into account.

Erlandsson's (2012) study also examined the relationship between disgust as a trait (disgust sensitivity) and moral judgments, dividing moral judgments into consequentialistic and non-consequentialistic. In the former type, good consequences imply pleasure; whereas bad consequences are associated with suffering. Furthermore, Erlandsson focused on three attributes of morality: absolute rules, absolute loyalty, and retributive punishment. The results of the study supported the fact that disgust not only influences the severity of moral judgments but also their direction in the sense that there was a correlation between disgust sensitivity and non-consequentialistic moral approaches. This correlation was present in all of the three facets of morality mentioned above. However, one limitation of this study was the fact that it made use only of pathogen disgust (i.e., transgressions of bodily surfaces and death) and not moral disgust.

Horberg et al. (2009) found evidence supporting the connection between disgust as a trait and 'purity' violations. They investigated the relationship between trait disgust and moral judgments (Study 3) concerning judgments about purity transgressions (e.g., keeping an unkept and dirty living space) and justice violations (e.g., interrupting a meeting, leaving a small tip). The measurement of disgust sensitivity consisted of asking participants how often in their everyday lives they felt grossed out, repulsed, and disgusted. In comparing the link between trait disgust and

purity judgments with another trait (fear), they found that participants with a higher disgust trait were more inclined to condemn behaviors that were not pure and to reward behaviors considered pure. However, no such connection was found for the justice domain (Horberg et al., 2009), and these findings might be in contradiction with the majority of the aforementioned studies that have shown that trait disgust is also connected with pure (i.e., moral) violations. Nevertheless, as Chapman and Anderson (2013) pointed out, the validity and reliability of the measure of trait disgust used by Horberg et al. (2009) was unknown, and the same was true of its relationship with the more widely used disgust sensitivity. Moreover, it is not clear if the justice scenarios were fully representative of the full range of nonphysical disgust violations (e.g., leaving a small tip might not necessarily mean a morally wrong action, but it could very well be just an irritating oddity of personality; Chapman & Anderson, 2013).

David and Olatunji (2011) tried to investigate whether the relationship between disgust and moral judgments pertained to everybody or only to individuals with higher disgust sensitivity by using evaluative conditioning (EC). EC can be defined as the relocation of an emotion from one stimulus to another by joining them in a classical conditioning model (De Houwer, Baeyens, Vansteenwegen, & Eelen, 2000). After linking a neutral word ('part') to a set of images that provoked disgust, participants were asked to rate the disgust and morality of moral violations that contained either the conditioned word or another neutral word ('some'). Results showed that participants did indeed rate the violations as being more disgusting, but not morally wrong when they contained the conditioned word compared to when they contained the neutral word. Furthermore, after controlling for EC of disgust, disgust sensitivity did not predict either disgust or morality appraisals towards violations. The fact that the higher ratings of disgust towards transgressions were predicted only by the conditioning suggests that disgust sensitivity was not involved. These findings are inconsistent with those of studies stating that there is a connection between disgust sensitivity and moral judgments (Inbar et al., 2009; Jones & Fitness, 2008) because, as the authors suggested, they "did not significantly predict the degree to which participants found transgressions containing 'part' more disgusting than transgressions containing 'some'" (David & Olatunji, 2011, p. 1146). Furthermore, their findings did not find the violations as being more morally wrong. However, they presumed that it might have been due to the fact that they used EC as a disgust-induction method that might have been less powerful than those already employed in other studies (David & Olatunji, 2011).

In summary, research investigating disgust sensitivity seems to have provided evidence of the relation between disgust and moral judgments. More precisely, a number of studies have determined that people who have a tendency to experience greater physical disgust judge moral transgressions more severely and also display more negative attitudes towards certain political and socio-moral issues and even towards out-groups. Even though there are

some findings that this relationship stands for physically disgusting violations, there is a need for future research to better describe the relationship between certain kinds of transgressions that are connected to DS (Chapman & Anderson, 2013).

### **Claim 3: Disgust Is Just Anger in Disguise**

The final issue addressed in this review is the claim that disgust is just anger in disguise. Apart from being the most compared emotions with respect to their effect on moral judgments, disgust and anger have had the greatest controversies in the literature. For example, Royzman and Sabini (2001) assumed that disgust had only a metaphorical function in the moral sphere, and that moral disgust triggers were actually anger triggers illustrated with disgust vocabulary for higher rhetorical impact. Furthermore, Nabi (2002) also believes that the layman's comprehension of the word 'disgust' is in fact a combination of disgust and anger. In contrast to these assumptions, there is empirical evidence that disgust and anger can, in fact, be separated (e.g., Chapman et al., 2009) which might provide indication against the claim that disgust is just anger in disguise. Once again I am also concerned with how much of this claim is connected to moral evaluations of pure transgressions or those reminding us of physical disgust. For instance, there is evidence suggesting that anger and not disgust responds more powerfully to manipulations of the intentionality of a wrong action and whether it causes harm to others (Giner-Sorolla, Bosson, Caswell, & Hettlinger, 2012; Gutierrez & Giner-Sorolla, 2007; Russell & Giner-Sorolla, 2011a).

However, one important caveat in some studies (Giner-Sorolla et al., 2012; Gutierrez & Giner-Sorolla, 2007; Russell & Giner-Sorolla, 2011a, 2011b) is that they made use of standardized data. As mentioned before, one of the peripheral aims of this review is concerned with whether moral judgments influenced by physical disgust are restricted only to transgressions that remind us of physically disgusting stimuli or also extended to pure transgressions. As Chapman and Anderson (2013) pointed out, data on absolute levels of disgust are necessary; standardized data do not provide useful information because they do not address absolute levels. For example, this type of data could suggest that pure transgressions evoke lesser feelings of disgust than those that contain physically disgusting stimuli, but this would not provide any information on whether pure transgressions evoke any disgust at all (i.e., more than a zero level; Chapman & Anderson, 2013). This implies that standardized data gives us information about relative levels of disgust, but it points to the more straight-forward assumption that disgust plays a part in violations that remind of physical disgust. It does this by indicating greater levels of disgust for physically disgusting than pure violations but it is not telling us very much about pure moral transgressions (i.e., if they actually elicit any disgust at all; Chapman & Anderson, 2013). For this reason, they were not included in this review.

Nevertheless, the research that has laid the groundwork for comparing disgust and anger (albeit with other

emotions such as contempt) was Rozin et al.'s (1999) CAD (contempt, anger, disgust; community, autonomy, divinity) triad hypothesis. The CAD triad hypothesis suggests that three different types of moral emotions—contempt, anger, and disgust—fit clearly with three different types of moral codes: community, autonomy, and divinity. Rozin et al. (1999) tested the CAD hypothesis and found that: (1) contempt was related to moral judgments about the community (e.g., failing to perform one's responsibilities or problems with the hierarchy within a community); (2) anger was related to judgments concerning autonomy (e.g., actions that harm another person and/or violate their rights); and (3) disgust was associated with purity judgments (e.g., actions that corrupt the body or the soul such as incest, touching a corpse, or eating a piece of rotten meat).

Horberg et al. (2009; Study 1) also found further supporting evidence connecting disgust to purity. After reading four vignettes (two related to purity violations and the other two related to justice violations), participants rated the extent to which they blamed the transgressions and also the extent to which the transgressions triggered feelings of disgust and anger. The findings suggested that, on one hand, disgust made participants make more severe moral judgments concerning violations of purity while, on the other hand, anger predicted more severe judgments concerning violations of justice.

However, Hutcherson and Gross (2011; Study 1), by asking participants to report if they felt "anger, contempt, moral disgust, sadness, fear/anxiety, and grossed out" (p. 724), contrary to Rozin et al. (1999), reported that the term 'moral disgust' was powerfully associated with both autonomy and community transgressions and was also almost equally endorsed than 'grossed out' in divinity transgressions. However, 'grossed out' still had a slightly more substantial connection with divinity violations. Nevertheless, both 'moral disgust' and 'grossed out' were rated significantly higher than anger in all three spheres (i.e., community, autonomy and divinity). Furthermore, in Study 2, by presenting participants with transgressions that differed in the level of self-relevance (i.e., whether the victim was the participant, a friend of theirs, or a generic other), the authors reported that anger was the most likely emotion when the victim was the self and the lowest when the victim was a generic other. On the other hand, disgust showed the opposite pattern (i.e., highest when the victim was another and lowest when the victim was the self). These results suggest that while disgust is linked with the intention and malevolence of the wrongdoer, anger is linked with the actual act of physical assault against a direct threat (Hutcherson & Gross, 2011).

Simpson, Carter, Anthony, and Overton (2006) provided further evidence that pure transgressions trigger a disgust response in addition to anger. Participants were shown images containing physically disgusting elicitors (e.g., cockroaches, an infected wound) or pure moral transgressions (e.g., political hypocrisy, racial violence) along with a written description of each image. Although the physically disgusting elicitors evoked a higher level of disgust than anger,

the findings suggested powerful and almost equal ratings of both disgust and anger towards the images containing pure (i.e., moral) transgressions (Simpson et al., 2006).

Chapman et al. (2009) examined the influence of disgust on participants' behavior during the ultimatum game (UG) paradigm. In the UG two players are supposed to divide an amount of money (in this specific study, \$10). The first player; the proposer, suggests an offer regarding to how the money should be divided between the two. The second player; the responder, can accept their offer and the amount is divided as suggested, or they can reject the offer and neither one of the two players gets any amount of money. The results suggested that when participants experienced a high degree of unfairness, they showed both self-reported and facial signs of disgust. In comparison to anger, unfair offers triggered a greater self-reported disgust. Furthermore, when the offers became more and more unfair, the increase in the self-reported level of disgust was accompanied by an increase in the activity of *levator labii* (LL; the facial motor measure of disgust). Additionally, LL was correlated with self-reported disgust and not anger (Chapman et al., 2009).

Similarly, Cannon, Schnall, and White (2011) recorded muscle activity related to both disgust and anger while participants evaluated scenarios that included both good and wrong acts connected to five morality foundations, amongst which were purity, fairness and harm. The results provided evidence suggesting that violations of purity (albeit followed by fairness) were the most powerfully connected with disgust; whereas violations of harm were more associated with anger (Cannon et al., 2011).

Another study comparing disgust with anger (Ugazio et al., 2012) indicated that people's choices when judging a moral story depended on the type of emotions elicited, whilst the influence the emotions exert on their judgments depended on the motivational aspect (i.e., approach and withdrawal). More precisely, when people are angry, they tended to judge moral situations in a more tolerant manner; whereas when they were under the influence of disgust, they judged the situation in the opposite manner (i.e., less tolerant). One possible explanation for this would be that anger is a more approach-related emotion; whereas disgust is a more avoidance-related one. This pattern was present across both personal and impersonal scenarios. One potential justification for this was that, no matter whether the scenario is personal or impersonal, the situations required people to take actions rather than engage in abstract reasoning (Ugazio et al., 2012).

Taken together, the aforementioned studies indicate a substantial convergence on the fact that disgust is not just anger in disguise. There is evidence that disgust and anger act differently when it comes to pure transgressions or those of physical disgust. For example, some studies (e.g., Horberg et al., 2009; Rozin et al., 1999) have suggested that disgust is more strongly connected with physically disgusting (e.g., purity) transgressions than anger is. In contrast, anger is more powerfully associated with pure transgressions (e.g., justice, autonomy). Nevertheless, these studies have an important limitation; namely the

use of verbal self-reports that I discuss in the next section. Regardless, other studies (e.g., Hutcherson & Gross, 2011; Simpson et al., 2006) suggest that pure transgressions trigger a joint occurrence between self-reported disgust and self-reported anger. However, others (e.g., Cannon et al., 2001; Chapman et al., 2009, Ugazio et al., 2012) suggest that disgust can actually be differentiated from anger. For example, experiencing an unfair offer, or reading about other people having this experience, leads to an activation of the LL that is connected with disgust and not anger (Cannon et al., 2011; Chapman et al., 2009). To conclude, although there is sufficient evidence to believe that disgust and anger are connected in their response to moral judgments that include pure transgressions; they, in fact, act distinctively (Chapman & Anderson, 2013). One potential explanation could be that disgust is considered an avoidance-motivated and distancing emotion; whereas anger is considered more of an approach-motivated and reactive emotion (Mackie, Devos, & Smith, 2000; Russell & Giner-Sorolla, 2011a; Ugazio et al., 2012). However, this assumption needs to be tested empirically in order to be confirmed.

## Discussion

The studies reviewed in this paper, despite their limitations, have begun to converge on the fact that disgust does indeed have a role in moral judgments. In this review, I outlined three different assumptions on the role of disgust in moral cognition. More specifically, the individual studies were classified into one of the three main categories depending on whether they were compatible with the claim that disgust increases the severity of moral evaluations (Claim 1), disgust as a personality trait is connected with variations in moral evaluations (Claim 2), or that disgust is just anger in disguise (Claim 3). Notably, while there is substantial support for the first and second claims, the empirical evidence against the third claim is substantial enough to provide a well-supported argument against it.

Certainly, the lines of demarcation between the categories I suggest are not strict and some of the reviewed research can be open for (re)evaluation. For example, some of the studies that were included in Claim 1 could very well support or not support, to some degree, Claim 3, or some of them (e.g., Horberg et al., 2009) could be representative for all three claims. Rather than providing a stringent framework, this review aimed at providing a flexible direction that may progress; and, in this way, incorporate new studies or well-founded arguments against the ones already included in the three categories.

Furthermore, one important question present throughout all of these three claims was whether the connection between disgust and moral judgments is limited only to violations that remind us of physical disgust or whether it can be expanded to the realm of pure transgressions (i.e., moral; non-physically disgusting). Although previous work proposed that both types of transgressions are similar to each other, there are studies that suggest the existence of important differences between the two. In terms of

similarity, the way people experience moral and physical disgust is sufficiently akin that they will describe both kinds of stimuli as 'disgusting' (e.g., Simpson et al., 2006) and pair them both with facial signs of disgust that indicate a bad taste or smell (e.g., Chapman et al., 2009; Gutierrez, Giner-Sorolla, & Vasiljevic, 2012). Furthermore, both moral and physical disgust trigger shared features of the classical disgust expression (e.g., Cannon et al., 2011; Chapman et al., 2009). Lastly, evidence from neuro-scientific studies (although not reviewed here since they are outside of the three claims) suggests that both share some overlapping brain networks (e.g., Moll et al., 2005; Parkinson et al., 2011; Schaich Borg, Lieberman, & Kiehl, 2008).

In terms of differences, moral disgust occurs frequently along with other negative emotions, whereas physical disgust is more often evoked on its own (Simpson et al., 2006). Furthermore, the aforementioned neuro-scientific studies also suggest some differences between the two types of disgust. Lastly, some studies have provided evidence that by inducing physical disgust, both transgressions that contain either physical or moral disgust are judged more severely (e.g., Schnall et al., 2008; Wheatley & Haidt, 2005).

What can we discern from these similarities and differences? As Chapman and Anderson (2013) pointed out, one can easily jump to the assumption that the existence of differences might imply that moral disgust is not a real form of disgust. However, moral and physical disgust also differ in terms of their triggering stimuli: The evoking stimuli for moral disgust are of a more abstract and social kind than those for physical disgust (Chapman et al., 2009). This could imply that moral disgust can be understood as being a specialized development of physical disgust produced to play a social rather than a disease avoidance role (Chapman & Anderson, 2013).

### Limitations and Future Directions

One salient limitation of the literature reviewed here is that there is little evidence whether an association between disgust and non-moral judgments exists. The only studies that provided additional evidence on this are Schnall et al. (2008); whose findings suggested that disgust did not influence non-moral judgments (i.e., not rendering them more severe), and, Wheatley and Haidt (2005), who did suggest that disgust renders non-moral behaviors as judged more severely. Although, there have undoubtedly been other studies not included here (e.g., Nichols, 2002) that have suggested that disgust also exerts a moralizing function (i.e., morally neutral behaviors that can be given a moral status just because they perceived as being disgusting), the empirical evidence is too limited to draw a clear-cut conclusion (see Avramova & Inbar, 2013; Pizarro, Inbar, & Helion, 2011 for a review). Furthermore, regarding disgust as a trait, there are generally no studies that examined the possibility of whether disgust sensitivity could also be associated with evaluations of non-moral contexts. These issues remain unsolved and constitute a worthy direction for future research to investigate further.

Furthermore, one important limitation that could potentially explain some of the contradicting findings regarding whether moral disgust is associated only or primarily with violations that contain physically disgusting stimuli or also with violations that are considered pure, is the fact that some of the studies used different pure transgression vignettes. Having different types of transgressions could also lead to different interpretations (e.g., whilst most people believe that racial violence and accepting bribe are unquestionably wrong, other matters such as interrupting a meeting might not be judged as being morally wrong if, for example, the agent had a perfectly justifiable reason to do so). Further research might need to take this issue into account and use clear-cut pure transgressions (i.e., transgressions that are universally considered wrong) in their studies.

Another central limitation surrounding this debate is made salient in the studies that compared disgust with anger. Some of the main findings are harder to interpret due to two main issues: use of standardized data (as discussed previously) and verbal self-reports (e.g., Horberg et al., 2009; Rozin et al., 1999). Regarding the latter, one issue is the possibility for bias against moral disgust (Chapman & Anderson, 2013). For instance, previous research suggested that by asking participants to remember an episode when they felt either 'disgust' or 'disgusted', this triggers self-reports of both physical and moral disgust. However, using words such as 'grossed out' and 'revulsion' elicits recalls of physical disgust (Nabi, 2002). Thus, verbal self-reports of disgust toward moral violations are substantially predicted by verbal self-reports of anger (Gutierrez et al., 2012). Even though it might be easily to assume that disgust and anger often occur together, it might also very well be that participants who are English-speaking make use of these two words interchangeably (Nabi, 2002). Nevertheless, in order to avoid this, several studies made use of endorsements of facial expressions as an aid or substitute of the usual verbal self-report (e.g., Chapman et al., 2009). However, the research is limited in combining both types of self-reports (verbal and endorsements) and investigating the connection between disgust moral evaluations concerning both physically disgusting transgressions and pure transgressions. Nevertheless, this can constitute a future avenue for prospective research that can portray a more accurate picture on the role that anger and disgust play in both moral transgressions and physically disgusting ones.

Furthermore, another limitation is the fact that some studies (e.g., Björklund, 2004; Erlandsson, 2008; Wheatley & Haidt, 2005) did not include another emotion to compare disgust with. Even though most studies have included other emotions (e.g., anger, notably and also contempt, fear), future research could replicate these studies along with including other emotions in order to strengthen the findings that converge on the fact that disgust is inherently different than other emotions in its connection to moral judgments.

The substantial amount of work done on moral disgust has increased our knowledge about this emotion.

Nevertheless, there are still many unanswered questions. Most of the findings and implications of the studies reviewed here address one of the most important ones: Is disgust an unreasoned emotion?

### Is disgust an unreasoned emotion?

A growing number of studies have criticized disgust as a morally unacceptable emotion in social judgments, emphasizing that some of the features of disgust, while beneficial in their reaction to pathogens, render disgust unsuitable for morality (e.g., Kelly, 2011; Nussbaum, 2009). Some of these include moral dumbfounding (i.e., “the stubborn and puzzled maintenance of a moral judgment without supporting reasons”; Haidt, Bjorklund, & Murphy, 2000, p. 1), insensitivity to circumstantial factors and reappraisal, lack of cognitive and behavioral sensitivity, dehumanization, and a focus on the person and not on their actions (e.g., Harris & Fiske, 2006; Hodson & Costello, 2007; Schnall et al., 2008). However, as previously stated, many argue that disgust has advanced into a regulating role in social behaviors and it is still continuing to serve its role (Tybur et al., 2013). For example, Clark and Fessler (2014) argue that the extensive function of disgust is not only to protect the ‘self’ from pathogens, but also protect more abstract elements such as groups or categories that people identify with (e.g., possessions, personal space, family, friends, culture). Thus, disgust might have also extended to the social domain, and it could serve to define the normative lines that encircle people’s social and moral identity, resulting in avoiding or rejecting those individuals who break those norms (Clark & Fessler, 2014).

### Summary and Conclusion

In this paper, I have reviewed an increasing array of research that has explored the role of disgust in moral judgments. Most of the research presented here converges on the assumption that disgust does indeed play a substantial role in moral cognition. Furthermore, most of the studies also converge on the facts that disgust increases the severity of moral evaluations (Claim 1), individual differences in the propensity to be experience disgust are connected to differences in moral evaluations (Claim 2), and disgust is not just anger in disguise (opposite to Claim 3). Nevertheless, there is a need to pose more specific questions regarding the involvement of disgust in moral judgments. One of the questions that has been present is whether this involvement is concerned only with transgressions that contain physical disgust or also pure (i.e., moral) transgressions. Even though there are both similarities and differences between the two kinds of transgressions, one potential explanation, as discussed in the previous section, could simply be that the connection between physical disgust with pure moral transgressions is a matter of evolution of disgust from protection from pathogens and disease to the social and moral realm (e.g., protecting the social ‘self’ from agents that could threaten one’s integrity; Clark & Fessler, 2014). Nevertheless, this sets out a fruitful future avenue for prospective research

to further investigate this matter and provide a more clear-cut and integrated framework.

Furthermore, there are still many questions that are left unanswered. For instance, is disgust also associated with non-moral judgments? How did disgust come to be connected to specific types of moral judgments (i.e., purity, harm)? How does disgust exert its increasing severity effect on moral evaluations? With so many unexplored questions, it is hoped that, in the future, new research will be able to provide the answers.

### Competing interests

The author declare that they have no competing interests in publishing this article.

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