

# Disgust and Anger Relate to Different Aggressive Responses to Moral Violations



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## Abstract

In response to the same moral violation, some people report experiencing anger, and others report feeling disgust. Do differences in emotional responses to moral violations reflect idiosyncratic differences in the communication of outrage, or do they reflect differences in motivational states? Whereas equivalence accounts suggest that anger and disgust are interchangeable expressions of condemnation, sociofunctional accounts suggest that they have distinct antecedents and consequences. We tested these accounts by investigating whether anger and disgust vary depending on the costs imposed by moral violations and whether they differentially correspond with aggressive tendencies. Results across four studies favor a sociofunctional account: When the target of a moral violation shifts from the self to another person, anger decreases, but disgust increases. Whereas anger is associated with high-cost, direct aggression, disgust is associated with less costly indirect aggression. Finally, whether the target of a moral violation is the self or another person influences direct aggression partially via anger and influences indirect aggression partially via disgust.

## Keywords

anger, disgust, emotions, morality, aggression, open data, open materials

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In the era of Internet outrage, moral violations have become increasingly visible. Indeed, online expressions of moral condemnation have become so widespread that *Slate* declared 2014 “the year of outrage.” Stories such as that describing Cecil the Lion’s 2015 death at the hands of dentist-hunter Walter Palmer are invariably followed by a sea of negative, morally condemning comments. At the surface, such comments might appear to be expressing a single sentiment: outrage. A closer look can reveal subtle differences, though; some comments refer to being angry, whereas others refer to being disgusted. Can the emotions underlying outrage provide insight into people’s responses to moral violations? And, specifically, does the distinction between anger and disgust—the moral emotions that most strongly underlie outrage (Gutierrez & Giner-Sorolla, 2007; Hutcherson & Gross, 2011; Royzman, Atanasov, Landy, Parks, & Gepty, 2014; Rozin, Lowery, Imada, & Haidt, 1999)—capture meaningful differences in how people respond to moral violations? Or are differences in the emotions underlying condemnation

illusions of language—idiosyncratic preferences for communicating outrage?

Some approaches to this question suggest that there are meaningful differences between disgust and anger in response to moral violations, and that the emotion underlying outrage depends on the content of a moral violation. For example, according to the CAD model, moral violations of community, autonomy, and divinity ethics elicit the emotions contempt, anger, and disgust, respectively (Rozin et al., 1999; Russell, Piazza, & Giner-Sorolla, 2013). Similarly, moral-foundations theory (Graham, Haidt, & Nosek, 2009) posits that moral violations involving purity or sanctity uniquely elicit disgust, whereas other moral violations (e.g., those involving harm-care or

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fairness-reciprocity) do not. However, accumulating evidence has challenged the idea of clean mappings of moral emotions on the content of moral violations (Cameron, Lindquist, & Gray, 2015). In contrast with the CAD model's predictions, recent work suggests that pathogen-free violations of divinity ethics elicit stronger anger than disgust (Royzman et al., 2014), and that violations of autonomy ethics (e.g., "a person steals a purse from a blind person") and community ethics (e.g., "a 16-year-old refuses to give up his/her seat on the bus to a crippled old lady") elicit stronger feelings of moral disgust than anger and contempt (Hutcherson & Gross, 2011).

Although much research has focused on testing correspondences between moral content and distinct emotions, the reasons underlying variability in responses to moral violations with *similar* content have received less attention. Findings that participants report high levels of both anger and disgust toward moral violators—and that verbal self-reports of anger and disgust are highly correlated ( $r$ s as high as .82; Gutierrez & Giner-Sorolla, 2007)—have been interpreted as suggesting that the terms *anger* and *disgust* are "semantic equivalents," (Hutcherson & Gross, 2011, p. 720) used interchangeably to express moral outrage (Nabi, 2002; see also Marzillier & Davey, 2004; Simpson, Carter, Anthony, & Overton, 2006). However, little research has directly tested whether anger and disgust elicited by identical moral violations are equivalent in their antecedents and functional outcomes. In the studies reported here, we investigated whether anger and disgust vary as a function of the costs imposed by moral violations, and whether, in turn, they motivate distinct aggressive strategies toward transgressors.

## Sociofunctional Approaches to Anger and Disgust

Sociofunctional approaches to moral emotions, which highlight the adaptive costs and benefits of emotions and their accompanying motivational states, may shed light on the differences between anger and disgust elicited by identical moral violations. Anger motivates approach or attack tendencies (Carver & Harmon-Jones, 2009; Harmon-Jones & Allen, 1998), and it can reduce the costs a person incurs because of others' moral violations by compelling perpetrators to change their behavior in ways that place more weight on the angry person's interests (Fischer & Roseman, 2007; Sell, Tooby, & Cosmides, 2009). Indeed, anger is associated with overt punishment of immoral behavior (Fischer & Roseman, 2007; Seip, Van Dijk, & Rotteveel, 2014), and expressions of anger alter negotiation counterparts' behavior by eliciting more concessions (Reed, DeScioli, & Pinker, 2014; Van Kleef, De Dreu, & Manstead, 2004).

Whereas anger toward moral violations motivates costly approach tendencies, moral disgust—at least at the

trait level—is associated with lower motivations to seek vengeance (Richman, DeWall, Pond, Lambert, & Fincham, 2014), especially via direct confrontation (Pond et al., 2012). That said, although moral disgust is viewed as motivating avoidance of moral violators (Curtis & Biran, 2001; Gutierrez & Giner-Sorolla, 2007; Hutcherson & Gross, 2011; Tybur, Lieberman, & Griskevicius, 2009), it does not necessarily motivate avoidance of physical contact in the same way that disgust toward pathogen cues does (Tybur, Lieberman, Kurzban, & DeScioli, 2013). Instead, moral disgust might neutralize the threats posed by moral violators by social distancing, or by recruiting punishment from other people. For example, Curtis and Biran (2001) argued that any avoidance associated with moral disgust functions "to punish and ostracize" (p. 29) moral offenders, and Haidt (2003) proposed that moral disgust functions to deter "culturally inappropriate behaviors, particularly those involving the body" (p. 858; see also Rozin, Haidt, & McCauley, 2008; Russell & Giner-Sorolla, 2013). Indeed, evidence suggests that moral disgust predicts nonviolent punishment behavior (e.g., rejection of unfair offers in economic games; Chapman, Kim, Susskind, & Anderson, 2009), and is a better predictor of such behavior than anger is.

In sum, both equivalence and sociofunctional approaches predict that anger and disgust are associated with punishment of moral violators. However, a sociofunctional account further predicts that anger and disgust are associated with distinct punishment strategies tailored to the costs imposed by a moral violation.

## Variation in Aggressive Tactics

Aggressive strategies vary in their effectiveness at changing or stopping a transgressor's behavior, and they also vary in their costliness to the aggressor. Direct aggression, which involves face-to-face physical or verbal confrontation (e.g., hitting or insulting), is tailored to promptly and effectively stop other people's transgressions. It is not cost free, though; direct aggressors risk retaliation from the targets of their aggression and those targets' social allies (Archer & Coyne, 2005; Campbell, 1999). Indirect aggression, in contrast, involves manipulating other people's reputations or social standing, or excluding them from a group (e.g., by spreading negative information; Archer & Coyne, 2005) without direct confrontation. Thus, indirect aggression is less risky—given that it protects the aggressor's identity—but also less efficient in dealing with imminent threats, which instead warrant more direct, confrontational strategies.

If direct and indirect aggression vary as a function of the threats posed by moral violations—and the associated willingness to pay costs in aggressing—might anger and disgust in response to moral violations vary in a similar manner? Equivalence accounts, which view anger and disgust as indistinguishable expressions of moral outrage

(Nabi, 2002), suggest that they should not, but sociofunctional accounts imply that they do (Fischer & Roseman, 2007; Hutcherson & Gross, 2011; Sell et al., 2009; Tybur et al., 2013). Hence, equivalence and sociofunctional accounts make different predictions regarding (a) the relationship between the costs imposed by a moral violation and the emotion (anger vs. disgust) experienced in response to that violation and (b) the relationship between the emotion experienced and the kind of aggression (direct vs. indirect) that is likely to result.

Only one study has tested whether the emotion an individual experiences in response to a moral violation varies depending on the costs the moral violation imposes on that individual. In this study, participants' emotional responses to moral violations were measured, and the target of the violations (self vs. other) was manipulated, with the assumption that violations targeting the self are more personally costly than those targeting another person (Hutcherson & Gross, 2011). However, this study was limited by methods that confounded emotional experience with moral relevance (i.e., participants were asked the degree to which they experienced "moral disgust" and "anger"—but not "moral anger"; Russell et al., 2013). In the current studies, we aimed to more rigorously test whether anger and disgust, rather than reflecting equivalent responses to moral violations, depend on the self-relevance of those violations. If anger is associated with more costly punitive responses (i.e., direct aggression), then participants should report greater anger when moral violations target the self rather than another person. If disgust is associated with less costly punitive responses (i.e., indirect aggression), then participants should report greater disgust when moral violations target another person rather than the self. Across four studies, we investigated the relationships between the costs imposed by moral violations and the emotions and aggressive tendencies elicited by those violations.

## Study 1

### Method

Study 1 examined whether the magnitude of anger and disgust elicited by a moral violation depends on the target of the violation. After reading descriptions of moral violations, participants indicated the degree to which facial expressions of anger, disgust, and other emotions matched their reactions to the violations. The target of the violations (self vs. other) was varied across participants. Our key prediction was that participants who read a moral-violation scenario targeting someone other than themselves would experience more disgust than those who read a scenario targeting themselves, and that the opposite pattern would emerge for anger. We aimed to collect data from 200 participants, in order to have 80%

power to detect an interaction effect corresponding to a Cohen's  $d$  of 0.40. We did not conduct analyses until we had finished data collection, which was terminated after we reached our targeted sample size.

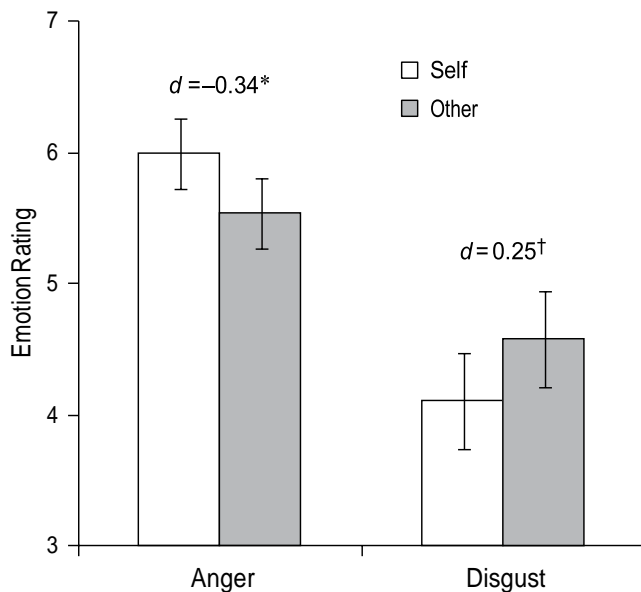
**Participants.** We recruited participants ( $N = 201$ ; 56.2% male; mean age = 31.7 years,  $SD = 10.78$ ) to complete an online survey on Amazon Mechanical Turk (MTurk), for a compensation of 25¢. All participants provided informed consent.

**Procedure.** Participants were randomly assigned to one of two conditions. In the *other* condition, participants read five scenarios in which another person was the target of a moral violation (e.g., "A person you knew stole someone else's ATM card and spent all of their money"). In the *self* condition, participants read the same five scenarios, except that the participant was described as the target (e.g., "A person you knew stole your ATM card and spent all of your money"). The scenarios were generated on the basis of a pilot study in which we asked participants to list a time when they felt morally disgusted by another person (for the text of the scenarios, see the Supplemental Material available online).

To measure emotional responses to the scenarios, we asked participants to endorse the degree to which arrays of faces expressing six basic emotions (anger, disgust, fear, sadness, happiness, and surprise) matched how they felt while reading the scenarios. Because endorsements of facial expressions do not rely on language—or on respondents' idiosyncratic definitions of emotion terms—they have been used as a methodological alternative to verbal self-reports (e.g., Gutierrez & Giner-Sorolla, 2007; Rozin et al., 1999; see also Chapman & Anderson, 2013). In this study, each array included three male and three female faces retrieved from the Radboud Faces Database (Langner et al., 2010). Following each scenario, participants saw arrays of all six emotional expressions and chose the one that best matched how they felt while reading the scenario. Then, they rated how well each array of expressions matched their feelings, using a 7-point Likert scale (1 = *strongly disagree*, 7 = *strongly agree*). Finally, participants saw only the anger and disgust arrays and selected which one best matched their response to the scenario.

### Results

Most participants endorsed either the anger (66.2%) or the disgust (22.4%) array as best matching their feelings while reading the scenarios. When forced to choose whether the anger array or the disgust array better matched their feelings, 76.6% of participants chose the anger array, and 23.4% chose the disgust array. The pattern of the mean ratings was similar: Participants most



**Fig. 1.** Results from Study 1: mean ratings of anger and disgust in the two target conditions (self vs. other). Error bars indicate 95% confidence intervals. The dagger and asterisk indicate the significance of the differences between conditions ( $^\dagger p < .10$ ,  $*p < .05$ ).

strongly endorsed the anger ( $M = 5.77$ ,  $SD = 1.39$ ) and disgust ( $M = 4.35$ ,  $SD = 1.90$ ) arrays as matching their feelings, and the mean ratings were lower for the sadness ( $M = 3.97$ ,  $SD = 1.68$ ), fear ( $M = 3.49$ ,  $SD = 1.79$ ), surprise ( $M = 2.96$ ,  $SD = 1.45$ ), and happiness ( $M = 1.29$ ,  $SD = 0.93$ ) arrays (for descriptive statistics and bivariate correlations, see Table S1 in the Supplemental Material). As expected, the use of facial arrays allowed for clearer distinctions between anger and disgust than have been obtained using verbal self-reports (e.g., Gutierrez & Giner-Sorolla, 2007). Indeed, there was no statistically significant relationship between endorsements of anger and disgust,  $r = -.01$ , 95% confidence interval (CI) =  $[-.15, .13]$ ,  $p > .25$ .

We tested our primary prediction—that varying the target in the moral-violation scenarios (other vs. self) would have opposing effects on anger and disgust—with a 2 (scenario target; between subjects)  $\times$  2 (emotion; within subjects) analysis of variance (ANOVA). Results were more consistent with a sociofunctional account than with an equivalence account, as the interaction of scenario target and emotion was statistically significant,  $F(1, 199) = 8.28$ ,  $p = .004$ ,  $\eta_p^2 = .04$ , 90% CI<sup>1</sup> =  $[.01, .09]$  (see Fig. 1).

Tests of the simple effects of target condition on ratings of anger and disgust were also consistent with a sociofunctional account. Anger was lower in the *other* condition compared with the *self* condition,  $t(199) = -2.41$ ,  $p = .017$ ,  $d = -0.34$ , 95% CI =  $[-0.62, -0.06]$ , but disgust showed the opposite pattern,  $t(199) = 1.78$ ,  $p = .077$ ,  $d = 0.25$ , 95% CI =  $[-0.03, 0.53]$ . We also tested whether the same interaction

emerged when other emotions replaced disgust in the analysis (i.e., whether anger decreased when the target shifted from self to other, whereas other emotions increased). A significant interaction emerged only in the analysis of anger and surprise,  $F(1, 199) = 4.86$ ,  $p = .029$ ,  $\eta_p^2 = .02$ , 90% CI =  $[.001, .07]$ . However, there was no simple effect of target condition on surprise,  $t(199) = 0.58$ ,  $p > .25$ ,  $d = 0.08$ , 95% CI =  $[-0.36, 0.19]$ .

## Study 2

### Method

Study 1 provided initial evidence that varying the target of a moral violation has distinct effects on feelings of anger and disgust. However, Study 1 relied on a small set of moral-violation scenarios, which may have limited its ecological validity (but see Brauer & Chekroun, 2005). To address this limitation, in Study 2 we analyzed data from an existing experience-sampling study in which participants reported their emotional responses—including anger and disgust—toward moral violations they had witnessed or been the targets of in their day-to-day lives (Hofmann, Wisneski, Brandt, & Skitka, 2014). Using repeated assessments of real-life moral violations, we tested whether experiencing moral violations directed toward oneself and witnessing moral violations directed toward other people had opposing effects on disgust and anger. (See Hofmann et al., 2014, for full information on the sample, procedure, and measures in the original study.)

**Participants.** Participants ( $N = 1,252$ ; 51.8% female; mean age = 31.9 years,  $SD = 9.96$ ) were recruited via various Web sites, social media, and newspaper ads in the United States and Canada. All participants provided informed consent.

**Procedure.** Participants first completed an intake survey, which assessed demographics and personality. On each of the next 3 days, they received five signals to complete an assessment on their smartphones. After each signal, they indicated whether they had recently committed, been the target of, witnessed, or learned about a moral or immoral event. They then wrote a description of and answered contextual questions about this event. Next, they indicated the extent to which they experienced each of nine moral emotions, including anger and disgust, in response to the described event (0 = *not at all*, 4 = *very much*).

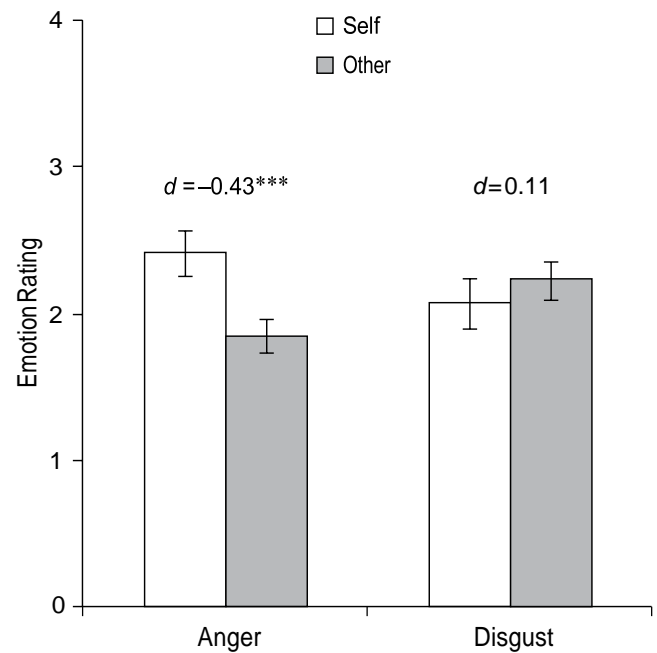
### Results

For the present study, we focused on reported immoral (rather than moral) events ( $N = 521$ ) that participants had

either been the targets of ( $n = 174$ , 33.4%) or witnessed ( $n = 347$ , 66.6%) in their everyday lives. Additional analyses including immoral acts that participants learned about via personal communication, online media, or other news outlets are detailed in the Supplemental Material. Participants' predominant emotional response to real-life moral violations was disgust ( $M = 2.20$ ,  $SD = 1.43$ ), which was followed by anger ( $M = 2.05$ ,  $SD = 1.36$ ) and contempt ( $M = 1.62$ ,  $SD = 1.34$ ). As has been found in past research that used verbal self-reports (e.g., Gutierrez & Giner-Sorolla, 2007)—and in contrast with our findings in Study 1, which instead used facial arrays—ratings of anger and disgust were highly correlated,  $r = .64$ , 95% CI = [.59, .69],  $p < .001$  (for descriptive statistics and bivariate correlations, see Table S2 in the Supplemental Material).

To test whether the target of the moral violation (self vs. other) affected the relative degree to which participants felt anger and disgust, we subtracted disgust scores from anger scores. To account for the nested nature of the data, we conducted multilevel modeling analyses (restricted maximum likelihood estimation, using the MIXED command in SPSS 21.0), in which we allowed both the intercepts and the slopes to vary randomly across participants. In line with the interaction found in Study 1, results indicated that the difference scores varied depending on whether the violations targeted the self or someone else,  $F(1, 290.99) = 14.24$ ,  $p < .001$ ,  $d = -0.36$ , 95% CI = [-0.55, -0.18]. The pattern was consistent with a sociofunctional perspective, as participants reported more anger than disgust when they were the target of an immoral act ( $M = 0.14$ , 95% CI = [-0.04, 0.32]), whereas they reported more disgust than anger when someone else was the target ( $M = -0.29$ , 95% CI = [-0.42, -0.15]).

Additional analyses showed that emotional responses were stronger overall when violations targeted the self, and this effect was more pronounced for anger,  $F(1, 292.47) = 38.11$ ,  $p < .001$ ,  $d = -0.57$ , 95% CI = [-0.76, -0.38], than for disgust,  $F(1, 274.75) = 5.90$ ,  $p = .016$ ,  $d = -0.23$ , 95% CI = [-0.41, -0.04]. Next, following existing research examining verbal endorsements of anger and disgust (which tend to be highly correlated; e.g., Gutierrez & Giner-Sorolla, 2007), we tested the effects of moral-violation target (self vs. other) on ratings of each emotion while controlling for the other (i.e., how target influenced anger ratings when we controlled for disgust and vice versa). Anger was higher in response to offenses that targeted the self compared with those that targeted someone else,  $F(1, 487.55) = 34.95$ ,  $p < .001$ ,  $d = -0.43$ , 95% CI = [-0.62, -0.25]. As in Study 1, the effect of the target's identity (self vs. other) on disgust was in the opposite direction, though it did not differ significantly from zero,  $F(1, 294.37) = 2.10$ ,  $p = .148$ ,  $d = 0.11$ , 95% CI = [-0.07, 0.29] (see Fig. 2).



**Fig. 2.** Results from Study 2: mean ratings of anger (controlling for disgust) and disgust (controlling for anger) when the target was the self and when the target was another person. Error bars indicate 95% confidence intervals. Asterisks indicate a significant difference between moral violations targeting the self and those targeting another person (\*\*\*)  $p < .001$ .

Finally, we tested whether similar results would emerge if we replaced disgust with contempt in our analysis of difference scores. There was no statistically significant effect of the target of moral violations on the difference between anger and contempt,  $F(1, 305.14) = 2.49$ ,  $p = .116$ ,  $d = -0.15$ , 95% CI = [-0.33, 0.03]; indeed, this effect size was outside the estimated 95% CI for the effect of moral-violation target on the difference between anger and disgust.