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Re-evaluating Moral Disgust:

Sensitivity to Many Affective States Predicts Extremity in Many Evaluative Judgments

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and

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Abstract

Disgust-sensitive individuals are particularly morally critical. Some theorists take this as evidence that disgust has a uniquely moral form: disgust contributes to moralization even of pathogen-free violations, and disgust's contribution to moralization is unique from other emotional states. We argue that the relationship between disgust sensitivity (DS) and moral judgment is not special in two respects. First, trait sensitivity to many other affective states, beyond disgust, predicts moral evaluations. Second, DS also predicts non-normative evaluative judgments. Four studies supported these hypotheses, using multiple measures of DS, and judgments of moral violations (Studies 1 and 4), conventional violations (Study 1), imprudent actions (Study 1), competence (Study 2), and aesthetic evaluations (Study 3). Our findings call into question the usefulness of "moral disgust" as a psychological construct by showing that the relationship between DS and moral condemnation is one instantiation of a more general association between affect and judgment.

Keywords: disgust sensitivity, emotion, moral judgment, aesthetic judgment, affect as information

Re-evaluating Moral Disgust:

Sensitivity to Many Affective States Predicts Extremity in Many Evaluative Judgments

The relationship between disgust and moral judgment has received substantial empirical attention of late (for reviews, see Chapman & Anderson, 2013; Giner-Sorolla & Russell, 2013; Piazza, Landy, Chakroff, Young, & Wasserman, in press). In this paper, we present a critical account of one particular claim: individual differences in the propensity to experience disgust predict the severity of moral condemnation. We argue that, while this effect is robust, it should not be interpreted as evidence for a unique connection between disgust and moral judgment. Rather, it is one example of a more general phenomenon, in which propensities to strongly experience affective states more broadly relate to more extreme evaluative judgments of many kinds.

Theoretical Background

Disgust is a negatively-valenced emotion associated with the rejection of contaminating substances, such as blood, sexual fluids, rotten food, bodily waste, and certain animals (Curtis, Aunger, & Rabie, 2004; Haidt, McCauley, & Rozin, 1994; Olatunji, Sawchuk, Lohr, & de Jong, 2004; Royzman & Sabini, 2001; Rozin & Fallon, 1987). Disgust most likely evolved to prevent ingestion of toxins and to motivate avoidance of pathogen vectors (Curtis & Biran, 2001; Duncan, Schaller, & Park, 2009; Fessler, Eng, & Navarrete, 2005; Oaten, Stevenson, & Case, 2009). More controversially, some have argued that disgust plays a distinct role in the condemnation of immoral actions or actors (e.g., Giner-Sorolla & Chapman, 2017; Rozin, Haidt, & McCauley, 2008; Tybur, Lieberman, Kurzban, & DeScioli, 2013). Some theorists have argued that disgust's relationship to morality is incidental, limited to transgressions that involve the presence of canonical disgust elicitors (e.g., gory violence, aberrant sexual acts; Piazza, Russell,

& Sousa, 2013; Royzman, Atanasov, Landy, Parks, & Gepty, 2014). Others claim a more integral role for disgust in moral judgment (e.g., Chapman & Anderson, 2013, Tybur, Lieberman, & Griskevicious, 2009). For example, Chapman and Anderson (2014) argue, “disgust’s role in the moral domain is not limited to physically disgusting transgressions” (p. 341), but extends to “moralization of transgressions that do not contain references to physical disgust stimuli” (p. 342). Importantly, researchers in this area argue for “moral disgust” as an explanatory construct; disgust within this conceptualization is thought to have a specifically *moral* function, such as increased vigilance, condemnation or rejection of moral offenders. Tybur et al. (2009) propose, “moral disgust motivates avoidance of social relationships with norm-violating individuals” (p. 107). Jones and Fitness (2008) assert, “the same psychological mechanisms that alert us to threats of physical contamination are also attuned to the presence of knavery” (p. 625; for further claims about a specifically moral form of disgust and its function, see Giner-Sorolla & Chapman, 2017; Hutcherson & Gross, 2011; Molho, Tybur, Güler, Balliet, & Hoffman, 2017; Tybur et al., 2013).

If disgust has a uniquely moral function, then several conditions should follow. First, the propensity to experience disgust (henceforth, *disgust sensitivity* or DS) should relate to all types of moral offenses, even those that do not involve canonical disgust elicitors, and, indeed, this assertion has received some empirical support (Chapman & Anderson, 2014; Jones & Fitness, 2008). Second, the construct “moral disgust” should be tractable: if disgust’s role in the moral domain is an integral one, and not incidental, then disgust’s operation in the moral sphere should be distinguishable, in degree or kind, from operations it might have in other evaluative domains. Finally, disgust’s role in moral condemnation should be distinguishable from other forms of strong affect, such as anger, sadness, excitement, or fear. On this point, Jones and Fitness (2008)

and Chapman and Anderson (2014) reported relationships between DS and condemnation of canonical moral violations over and above the relationship found between trait anxiety and condemnation, and trait anger and condemnation, which seems to support the moral disgust view.

Here we test an alternative to the moral disgust view: the disgust-morality relationship is not special, but represents one example of a more general phenomenon: chronic sensitivity to affective states, not limited to disgust, makes any sort of evaluative judgment more intense. This general extremity view follows from an affect-as-information perspective on evaluative judgment (e.g., Clore, Gasper, & Garvin, 2001; Schwarz & Clore, 1988; Storbeck & Clore, 2008). On this view, evaluations – moral or otherwise – are at least partially informed by whatever affective states are available to the decision maker at the time; thus, the stronger one’s propensity to feel any affective state, the more extreme one’s judgments will be in many domains. Similar predictions emerge from a constructionist view of emotion (Cameron, Lindquist, & Gray, 2015).

If disgust is not the only emotion that promotes harsher moral judgments, and DS has similar amplifying relationships with other, non-moral judgments, this would argue against the moral disgust view. For example, if disgust were no more related to moral condemnation than, say, anger, anxiety, or general arousal, then we would presumably need to abandon the idea of “moral disgust” (or, less parsimoniously, this would suggest an unjustified proliferation of moral emotions: “moral anxiety”, “moral arousal”, etc.). Similarly, if DS were found to be related to non-normative evaluations (i.e., judgments that do not involve considerations about how a person should or should not behave), for instance, of competence or attractiveness, this would suggest that “moral disgust” is not a useful construct (or, again, that we need to explicate the

concepts “competence-related disgust,” “aesthetic disgust,” etc.). Such results would suggest that “moral disgust” as a construct is not parsimonious and thus its usefulness should be re-evaluated.

The Present Studies

We tested two hypotheses that, if supported, would provide evidence against a privileged connection between disgust and moral judgments.

Hypothesis 1 (scope of evaluations). DS relates to the extremity of a variety of evaluative judgments, both normative and non-normative; the amplifying role of chronic disgust is not limited to moral evaluations.

Hypothesis 2 (scope of emotions). Chronic tendencies to experience a variety of emotional states are associated with more extreme normative judgments; multiple affective sensitivities play similar amplifying roles as DS.

Taken together, these hypotheses posit that sensitivity to affective states makes evaluations of negative stimuli more negative, and evaluations of positive stimuli more positive, regardless of whether the stimuli are morally relevant. We tested these hypotheses in four studies (and four supplemental studies). In Study 1, we tested Hypotheses 1 and 2 using vignette-based measures of emotional sensitivities and normative evaluations, and found that DS is related to harsher condemnation of imprudent but amoral actions, and that sensitivity to negative affect in general predicts normative judgments in much the same way that DS does. In Study 2, we sought a stronger test of Hypothesis 1, by showing that DS is related to evaluations of competence—a non-normative evaluation. In Study 3, we undertook an even stronger test of Hypothesis 1, and found that DS is related to more extreme aesthetic judgments—another non-normative domain of judgment. Finally, in Study 4, we tested Hypothesis 2 using image-based, rather than vignette-

based, measures of emotion and moral judgment, and again found that sensitivity to affective states, in general, predicts more extreme moral judgments.

Study 1

In Study 1, we sought to test Hypotheses 1 and 2, borrowing materials from Chapman and Anderson (2014). Chapman and Anderson tested the moral disgust view using stimuli that included both prototypical “moral transgressions,” where one person directly victimizes another (e.g., pushing someone to the ground) and “conventional transgressions,” where a person violates an accepted institutional rule (e.g., wearing a t-shirt to a school that requires uniforms, see Turiel, 1983). They found that individuals high in DS exhibited harsher judgments of both moral and conventional transgressions devoid of pathogen-linked content. High-DS individuals were also more likely to “moralize” conventional transgressions, i.e., to judge violations of convention to be wrong independent of whether a legitimate authority deemed them permissible.

We extended Chapman and Anderson’s materials in two critical ways. First, we included actions that are imprudent, but which have no social ramifications; any consequences of the actions affect only the actor themselves (e.g., running in the rain, eating junk food). Because such actions do not affect others, they are typically considered to be part of the “personal” domain, rather than the moral or conventional domain, and to be at the discretion of the actor (see, e.g., Nucci, 1981; Smetana, Jambon, & Ball, 2014; Tisak & Turiel, 1984). If DS were found to relate to more negative evaluations of these amoral actions, this would provide initial evidence for Hypothesis 1.

Second, we measured the propensity to experience a variety of other emotions in response to aversive, pathogen-relevant stimuli. In their studies, Chapman and Anderson (2014) included measures of trait anxiety and trait anger, and found that these measures did not relate to

moral judgment to the degree that DS did. However, the measures they used to assess these other emotions were not pitched at the same level of specificity as DS. While DS was measured with respect to specific hypothetical stimuli and events (e.g., spoiled foods, contact with a dead body), chronic anxiety and anger were measured with inventories containing items that reflect more general behavioral tendencies (e.g., “I am quick tempered”). Thus, it is unclear whether their results reflect a unique relationship between disgust and morality, or result from an incommensurability of measures (for further discussion, see Supplemental Study 1). Therefore, we measured all emotions at the same level of specificity.

Method

Participants. Participants located in the United States were recruited through Amazon Mechanical Turk, the same online platform through which Chapman and Anderson (2014, Study 2) recruited their participants. In all studies and supplemental studies, we only excluded participants for failing “Captcha” verifications or for failing to reach the end of the study. In Study 1, this left a final sample of $N = 202$ (42% female, $M_{Age} = 34.83$ years, range: 20-75). In all studies, we aimed to recruit approximately 200-300 participants, because correlations stabilize as sample sizes approach 250 (Schönbrodt & Perugini, 2013), and data collection was terminated prior to conducting any analyses.

Materials and procedure. Participants made judgments of eight moral and eight conventional violations set in the context of a high school, identical to the stimuli used by Chapman and Anderson (2014, Study 2). To these, we added five imprudent actions, set in the same context, for a total of 21 behavioral descriptions, presented in a new randomized order for each participant. For each action, participants indicated how wrong it was, how much they disapproved of it, and how wrong it would be “if the school’s principal said it was okay” (a

measure of authority independence, or “moralization”) on scales ranging from 1 (“Not at all”) to 5 (“Extremely”). Participants also responded to the pathogen subscale of the Three-Domain Disgust Scale (TDDS; Tybur et al., 2009). This subscale consists of seven descriptions of experiences involving potential pathogen vectors (e.g., “seeing some mold on old leftovers in your refrigerator”). It was used because it contains items that most theorists agree represent disgust-relevant stimuli. In the standard administration of the scale, participants indicate how disgusted each experience would make them feel on a 0-6 scale. We modified the measure by adding nine additional emotion terms: an additional disgust measure (“grossed out”, a lay term for disgust, see Nabi, 2002), and two terms each measuring anger (angry, irritated), general negative valence (distressed, negative), general arousal (alert, calm), and fear/anxiety (afraid, anxious). The ten emotion terms were presented in a new randomized order for each participant, and the order of presentation of the behavioral judgment block and the emotion sensitivity block was counterbalanced. After completing both blocks, participants responded to a brief demographics questionnaire.

The judgments that participants made, and our measure of DS, differ somewhat from those used by Chapman and Anderson (2014); we present a direct replication of their procedure with the addition of imprudent actions in Supplemental Study 1, the results of which parallel those reported here. No unreported measures were collected in any study reported in this paper, and full materials, raw data, and analysis scripts for all studies can be found at <https://osf.io/e47qh/>.

Results and Discussion

Judgments of wrongness, disapproval, and authority independence of moral and conventional violations and imprudent actions were averaged across all the acts in each category

(α s = .68-.89). Similarly, ratings of all ten emotions were averaged across the seven scenarios described in the emotion sensitivity measure (α s = .83-.87) to form ten composite measures of sensitivity to various emotional states.

Correlations between emotion sensitivity measures and judgments are presented in Table 1. Sensitivity to disgust was strongly related to the extremity of wrongness, disapproval, and authority-independence judgments of both moral and conventional offenses. More critically, there was a similarly robust, and comparably large, relationship between disgust sensitivity and judgments of imprudent actions, consistent with Hypothesis 1.

Table 1. Descriptive statistics and correlations ($df = 199$) between emotional sensitivity measures and judgments of actions, in Study

1.

		Moral - Wrong	Moral – Disap.	Moral – Auth.	Conv. – Wrong	Conv. – Disap.	Conv. – Auth.	Imp. – Wrong	Imp. – Disap.	Imp. – Auth.
	<i>M (SD)</i>	3.97 (0.66)	4.05 (0.68)	3.99 (0.69)	2.82 (0.85)	2.74 (0.91)	2.43 (0.99)	2.62 (0.81)	2.85 (0.81)	2.70 (0.84)
Disgusted	3.25 (1.31)	.30***	.28***	.25**	.32***	.29***	.22**	.31***	.24**	.26***
Grossed Out	3.35 (1.35)	.29***	.27***	.24***	.31***	.29***	.24**	.30***	.26***	.26***
Angry	1.62 (1.18)	.05	.01	.05	.31***	.29***	.33***	.41***	.33***	.38***
Irritated	2.66 (1.31)	.18**	.16*	.13 [†]	.26***	.23**	.18**	.36***	.31***	.33***
Distressed	2.09 (1.26)	.07	.04	.01	.25***	.21**	.22**	.30***	.26***	.25***
Negative	2.83 (1.29)	.19**	.19**	.17*	.24***	.20**	.16*	.29***	.22**	.25***
Alert	3.11 (1.35)	.21**	.24**	.12 [†]	.32***	.29***	.17*	.20**	.18**	.12 [†]
Calm	2.30 (1.32)	-.13 [†]	-.13 [†]	-.08	.03	.05	.06	-.01	-.06	.04
Afraid	1.21 (1.15)	-.07	-.08	-.07	.28***	.27***	.35***	.32***	.25***	.28***
Anxious	2.01 (1.31)	.07	.03	.04	.31***	.27***	.31***	.32***	.24***	.27***

Note. [†] $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$; one participant did not respond to the normative judgment items and is not included

in these analyses.

Furthermore, these relationships were not unique to disgust. While DS had the strongest relationship to judgments of prototypical moral violations, propensities to experience general negative affect (“negative”) and arousal (“alert”), and to feel “irritated” also showed reliable, though somewhat smaller, correlations with these judgments.¹ Moreover, every emotion that we measured, other than “calm”, showed robust relationships with judgments of conventional violations and imprudent actions, including moralization measures, most of them comparable in magnitude to the relationships exhibited by disgust sensitivity. In fact, anger generally had the strongest relationship with these judgments.²

Taken together, these results suggest that DS is associated with more extreme evaluative judgments of both moral and non-moral actions (Hypothesis 1), and that more extreme moral evaluations are exhibited by people with a propensity to experience a wide variety of emotional states, rather than disgust specifically (Hypothesis 2). Thus, this study provides initial evidence in support of the general extremity view. However, one might argue that judgments of imprudent actions, while not *moral* judgments, are still *normative* judgments, in that they are judgments of what one “should” or “should not” do. Thus, people may have treated them as roughly the same as moral judgments. Accordingly, in Study 2, we conducted a more stringent test of Hypothesis 1, examining whether DS is correlated with more extreme judgments of competence, an evaluative judgment that is distinct from judgments of morality (see, e.g., Brambilla, Rusconi, Sacchi, & Cherubini, 2011; Goodwin, Piazza, & Rozin, 2014; Landy, Piazza, & Goodwin, 2016; Wojciszke, Bazinska, & Jaworski, 1998).

¹ This result suggests that disgust may be somewhat *more* associated with judgments of classical moral violations, but not *uniquely* so, although it is worth noting that we do not find clear evidence for this “disgust dominant” pattern of results in Study 4 or Supplemental Study 4.

² The emotion sensitivity measures were highly inter-correlated (e.g., ignoring “calm”, *rs* ranged from .39 to .95 in Study 1 and from .34 to .95 in Study 2, all *ps* < .001). We therefore opted not to conduct multiple regression analyses.

Study 2

Method

Participants. Participants in the United States were recruited through Amazon Mechanical Turk. After exclusions, we retained a final sample of $N = 200$ (45% female, $M_{Age} = 36.79$ years, range: 20-69).

Materials and procedure. Emotion sensitivities were measured as in Study 1. This study did not include normative judgments, so it is primarily a test of Hypothesis 1 (scope of evaluations). Nonetheless, we included the same non-disgust emotion sensitivity measures from Study 1 to test an extension of Hypothesis 2: competence judgments, like moral judgments, are associated with a wide variety of affective sensitivities. Competence judgments were made in response to 15 imprudent actions – five from Study 1, and ten additional, all set in a high school (see Supplemental Materials). For each action, participants rated how “intelligent” and “competent” the student described in the scenario was, on 1-5 scales (1 = “Not at all”; 5 = “Extremely”). Order of presentation of the 15 actions was randomized for each participant, and the order of the two tasks was counterbalanced. After completing both tasks, participants responded to a short demographics questionnaire. Because all of the actions suggested some degree of incompetence or foolishness, we expected that sensitivity to affective states would relate to more extreme *criticism* of the characters’ competence.

Results and Discussion

Composite intelligence and competence ratings across the 15 imprudent actions ($\alpha = .89$ and $.88$, respectively) were highly correlated, $r(198) = .85$, $p < .001$, so we averaged these judgments together to form a composite measure. As would be expected, the characters were viewed as quite incompetent, $M = 2.22$, $SD = 0.48$, significantly below the midpoint of the scale,

$t(199) = 22.73, p < .001$. As in Study 1, we averaged the emotion ratings across the seven scenarios, to produce ten composite measures ($\alpha s = .83-.90$).

Correlations between emotion sensitivities and competence ratings are presented in Table 2. The most important result is that DS was associated with more negative competence ratings, supporting Hypothesis 1. Consistent with the extension of Hypothesis 2, the propensity to feel negative affect generally (“negative”) was also associated with more negative competence judgments, and the propensity to feel “irritated” showed a similarly-sized relationship ($p = .053$). Likewise, a tendency to feel less arousal (“calm”) was associated with less critical competence judgments, and this correlation was comparable in magnitude to the correlation for “disgusted”.

Table 2. Descriptive statistics for emotion sensitivity measures, and correlations ($df = 198$) between emotion sensitivity measures and competence judgments, Study 2.

	<i>M (SD)</i>	Competence
Disgusted	3.67 (1.36)	-.21**
Grossed Out	3.68 (1.41)	-.12
Angry	1.81 (1.36)	-.12 [†]
Irritated	3.00 (1.34)	-.14 [†]
Distressed	2.37 (1.46)	-.06
Negative	3.28 (1.47)	-.15*
Alert	3.62 (1.49)	-.02
Calm	2.27 (1.28)	.20**
Afraid	1.17 (1.16)	-.02
Anxious	2.14 (1.50)	-.04

Note. [†] $p < .10$, * $p < .05$, ** $p < .01$

Study 3

While the competence judgments made in Study 2 fall outside the normative domain, they still somewhat resemble normative judgments, in that they were made in response to a person’s actions. Therefore, in Study 3 we tested whether DS would be correlated with more extreme *aesthetic* judgments, i.e., ratings of the attractiveness of a person or object, in the absence of any action, an especially strong test of Hypothesis 1. A study by Park, van Leeuwen,

and Stephen (2012) has already garnered support for a link between DS (measured with the pathogen subscale of the TDDS) and more negative attractiveness ratings of unattractive faces, consistent with our general extremity view. We sought to extend this line of research by examining attractiveness ratings of four sets of stimuli: human faces, painted portraits, landscape paintings, and abstract paintings. We also used a different measure of DS to ensure the generality of our findings, the Disgust Scale – Revised (DS-R; Olatunji et al., 2007) and included, for exploratory purposes, the Emotion Regulation Questionnaire (see Supplemental Materials for discussion).

Method

Participants. Participants in the United States were recruited through Amazon Mechanical Turk. After exclusions, we retained a final sample of $N = 300$ (47% female, $M_{Age} = 33.63$ years, range: 18-68).

Materials and procedure. Participants viewed four blocks of 15 images each (male faces, abstract art, portraits, and landscapes, see Supplemental Materials) in a counterbalanced order. The order of images within each block was randomized for each participant. For each image (60 total), participants rated how attractive they found it and how much they liked it on Likert scales ranging from -6 to 6. Afterwards, participants responded to the DS-R and the ERQ in a counterbalanced order. Lastly, they responded to a brief demographics survey.

Results

Composite attractiveness and liking ratings of the faces, abstract art, landscapes, and portraits ($\alpha s = .84-.94$) were highly correlated, $r_s(298) > .87$, $p s < .001$, so we averaged across them to form one composite aesthetic evaluation of each type of stimulus. On average, the faces were rated somewhat negatively ($M = -1.37$, $SD = 1.77$, $t(299) = -13.43$, $p < .001$), the abstract

art and landscapes were rated somewhat positively ($M = 0.32$, $SD = 1.83$, $t(299) = 3.04$, $p = .003$; $M = 1.79$, $SD = 1.41$, $t(299) = 22.02$, $p < .001$, respectively), and the portraits were rated neutrally ($M = -0.10$, $SD = 2.01$; $t(299) = -0.90$, $p = .369$). Based on these observed mean values, the general extremity view suggests that DS should relate to more negative judgments of the faces, and more positive judgments of the abstract art and landscapes. We did not have a clear prediction regarding the portraits, because they were not rated significantly differently from zero.

DS was indeed negatively correlated with aesthetic ratings of the faces, $r(298) = -.12$, $p = .036$, and positively, though non-significantly, correlated with ratings for the abstract art, $r(298) = .10$, $p = .074$, and landscapes, $r(298) = .10$, $p = .100$. DS was also negatively correlated with ratings of the portraits, $r(298) = -.15$, $p = .011$. To derive an overall estimate of the extent to which DS correlates with extreme aesthetic judgments, we averaged across the three types of image for which our view makes a clear prediction (reverse-scoring the faces, such that a positive correlation indicates that DS relates to greater extremity). This composite measure was reliable ($\alpha_{\text{Attractiveness}} = .84$; $\alpha_{\text{Liking}} = .86$; $r(298) = .94$, $p < .001$), and, consistent with our view, DS correlated with more extreme evaluations, $r(298) = .18$, $p = .001$.

Discussion

Supporting Hypothesis 1, DS related to more extreme aesthetic judgments. Study 3 also supported a general extremity view over a similar, but distinct, “general negativity” view, whereby sensitivity to negative affect simply makes all evaluative judgments, including judgments of positively-valenced targets, more pessimistic or negative. We found instead that evaluations of positive stimuli (abstract art and landscapes) correlated (non-significantly) positively with DS; that is, the relationship DS had with evaluations was directionally the same as the overall appraised valence of the object. See Supplemental Study 3 for additional evidence

supporting the extremity view over the negativity view; this supplemental study revealed a positive association between DS and judgments of morally praiseworthy actions, and between other affective sensitivities and praise judgments.

Study 4

Studies 1-3 provided evidence for Hypothesis 1 across a wide variety of evaluative judgments. However, we have only directly examined Hypothesis 2 in Study 1. Therefore, we sought to replicate our finding that sensitivity to affect, beyond disgust, predicts moral condemnation. Our prior studies employed vignette-based measures of emotion sensitivity and vignette-based dependent measures. In Study 4, we employed a different sort of stimuli, images depicting emotional content and moral transgressions, to demonstrate the generalizability of our findings beyond a single method. Moreover, in Study 1, we assessed sensitivities to different affective states using a modified version of the TDDS. Because all of the items on this scale describe canonical disgust elicitors, participants may have treated all of the negative emotion terms (e.g., angry, anxious) like measures of disgust. Therefore, in Study 4, we assessed sensitivity to emotional states by using as eliciting stimuli images that relate specifically to each emotion.

Method

Participants. Participants in the United States were recruited through Amazon Mechanical Turk. After exclusions, we retained a final sample of $N = 251$ (51% female, $M_{Age} = 34.96$ years, range: 18-76).

Materials and procedure. Participants viewed six images drawn from the International Affective Picture System (IAPS, Lang, Bradley, & Cuthbert, 2008), each depicting a pathogen-free immoral act (e.g., a carjacking; a physical altercation between a man and a woman, see

Supplemental Materials for identification numbers). Participants rated how wrong each action was on a seven-point scale (1 = “Not at all wrong”, 7 = “Extremely wrong”). Emotion sensitivities were measured using a novel image-based method. Participants viewed four IAPS images each depicting content selected to evoke disgust, anger, sadness, fear, arousal, and general negative affect (see Supplemental Materials for more information). For each image, participants rated how much it made them feel the focal emotion on a 1-9 scale (1 = “Not at all”, 9 = “Extremely”): “grossed out”, “angry”, “sad”, “fearful”, “tense”, and “negative”. The order of the moral judgment and emotion sensitivity blocks was counterbalanced. Images within the moral judgment block were presented in a new randomized order for each participant. Within the emotion sensitivity block, the four items measuring each sensitivity were presented in separate sub-blocks. The order of these sub-blocks, and the images within each one, was randomized for each participant. At the end, participants responded to a brief demographics questionnaire.

Results and Discussion

Responses to each of the four-image emotion sensitivity scales (α s = .73-.88) were averaged to create six composite measures of affective sensitivities (see Table 3 for descriptive statistics). Wrongness ratings across the six images (α = .76) were also averaged together. On average, the actions depicted were rated above the scale midpoint of 4 (“Moderately wrong”), $M = 6.20$, $SD = 0.87$, $t(250) = 39.91$, $p < .001$, $d = 2.52$.

Table 3. Descriptive statistics for emotion sensitivity measures, and correlations ($df = 249$) between emotion sensitivity measures and wrongness judgments, Study 4.

	<i>M (SD)</i>	Wrongness
Grossed Out	6.57 (1.75)	.35***
Angry	5.68 (1.77)	.35***
Sad	6.53 (1.83)	.43***
Fearful	6.24 (2.26)	.34***
Tense	5.86 (2.19)	.33***

Negative 6.06 (1.81) .39***
Note. *** $p < .001$

Consistent with Study 1 and prior research, DS correlated with wrongness ratings. However, sensitivity to anger, fear, sadness, arousal, and negative affect also showed significant, and comparably-sized, correlations with wrongness ratings (see Table 3). This constitutes additional evidence in support of Hypothesis 2 – the relationship between DS and moral evaluation is not unique among affective sensitivities.

General Discussion

We have presented arguments and evidence that the association between chronic disgust sensitivity (DS) and moral condemnation is not evidence for a special connection between disgust and morality (the moral disgust view). We reasoned that this relationship may be more parsimoniously explained by processes that extend beyond moral evaluations to a variety of evaluative judgments, both normative and non-normative (Hypothesis 1) and beyond disgust to a more general sensitivity to affect (Hypothesis 2). Four studies (and four supplemental studies) supported this general extremity view. Using three different measures of DS, we found robust associations not just with condemnation of moral and conventional violations (Studies 1 and 4, Supplemental Study 4), but also of imprudent actions (Study 1, Supplemental Study 1), competence judgments (Study 2), aesthetic evaluations (Study 3, Supplemental Study 2), and evaluations of positive moral acts (Supplemental Study 3), supporting Hypothesis 1. Moreover, chronic sensitivities to other negative emotions, such as irritation and general negativity, are associated with normative judgments of moral and conventional violations in much the same way as DS (Studies 1 and 4, Supplemental Study 4), supporting Hypothesis 2.

Relation to Past Findings

These results join a growing number of findings that question the privileged relationship between disgust and moral judgment. For instance, although many studies have found that extrinsic, experimentally-induced feelings of disgust can lead to more severe condemnation (e.g., Eskine, Kacinik, & Prinz, 2011; Schnall, Haidt, Clore, & Jordan, 2008; Ugazio, Lamm, & Singer, 2012; Wheatley & Haidt, 2005), other work has failed to replicate this effect (Case, Oaten, & Stevenson, 2012; David & Olatunji, 2011; Johnson, Cheung, & Donnellan, 2014; Johnson et al., 2016), and a meta-analysis found that it is, at most, insubstantial (Landy & Goodwin, 2015). Furthermore, disgust seems to only be experienced in response to canonical elicitors like rotten meat (Royzman et al., 2014) or sexual aberrance (Russell & Piazza, 2015), and does not respond to features of actions that modulate people's moral judgments, such as mitigating circumstances (Piazza et al., 2013; Russell & Giner-Sorolla, 2011a) or intentions (Russell & Giner-Sorolla, 2011b). There is thus considerable recent evidence that disgust is not integral to moral judgments. While the robust link between DS and evaluations of pathogen-free violations may appear inconsistent with this conclusion, our findings reveal that the relationship between DS and moral evaluation is not evidence for a privileged connection between disgust and morality, and therefore should not be understood as a challenge to this emerging view.

Our results are more consistent with a generic role of affect in evaluative judgments (Clore et al., 2001; Storbeck & Clore, 2008). For instance, our findings with regards to Hypothesis 2 (scope of emotions) are consistent with research by Cheng, Ottati, and Price (2013), who found that inducing any high-arousal emotion can amplify the severity of moral judgments. Furthermore, with regards to Hypothesis 1 (scope of evaluation), Lerner, Small, and Loewenstein (2004) found that inducing extrinsic disgust led people to reduce the prices for

which they would be willing to sell owned objects, a patently non-moral evaluative consequence of experiencing disgust.

Limitations

Our results may be limited to *evaluative* forms of judgment (of which moral judgments are a subset), and may not readily extend to non-evaluative judgments, for example, of quantity, spatial distance, and other such “objective” judgments, in which affect may be less likely to exert an influence (though see Sherman, Haidt, & Clore, 2012, regarding an intriguing link between DS and light discrimination). Moreover, our perspective is limited by the correlational nature of our findings, which do not permit firm causal inferences. This, of course, applies to all research on trait-level disgust. Our hypotheses were concerned with dispositional emotion sensitivities, but future research could use experimental approaches to explore causal connections between state affect (generally) and evaluative judgments (of many sorts).

Conclusion

Our findings raise doubts about the special relationship between disgust and moral evaluation. Dispositional sensitivity to disgust does have an amplifying relationship with moral judgments, but this influence is not unique to disgust, nor is disgust’s influence limited to the moral domain. The relationship between disgust and moral judgment appears not to be privileged, and thus the law of parsimony poses a challenge to “moral disgust” as an explanatory concept. Our findings align more with the idea that sensitivity to affect more generally tends to amplify a whole host of evaluative judgments. Connecting research on disgust and morality to research on other emotions and other types of judgments will help to clarify and deepen our understanding of how affect, judgment, and morality intertwine.

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Supplemental Materials for “Re-evaluating Moral Disgust: Sensitivity to Many Emotions
Predicts Extremity in Many Evaluative Judgments”

[Author Information Removed for Review]

Supplements for Study 1

Imprudent Actions

- A student doesn't like the look of his raincoat, so he walks to school in the rain without it and gets soaked.
- A student cannot decide between buying pizza or chicken fingers for lunch, so she eats nothing and goes hungry.
- A student ignores his personal hygiene and mental health in order to devote more time to his studies.
- One student does not like another student because he likes different music from him.
- A student eats a handful of peanuts even though she is mildly allergic to them.

Supplements for Study 2

Additional Imprudent Actions

- A student buys a ticket to see a movie in the theater, but then decides to stay home and watch something else.
- A student stays up late studying, and is so tired the next day that it hurts their performance on a test.
- A student gets wrapped up in watching TV one morning, and misses the bus to school.
- A student who is a member of the school choir decides to go out with her friends instead of practicing her solo before the big concert.
- A student spends most of their allowance buying baseball cards and has no money left over to buy lunch at school.
- A student reveals to his classmates that he still likes playing with Power Ranger toys.
- A student feels lightheaded during class, but decides not to go to the school nurse.
- A student signs up for an elective computer programming class but decides not to study for the course.
- A student is not paying attention, and trips while walking down the hall, spilling his books and papers everywhere.
- A student decides not to use a lock for her locker and her stuff goes missing.

Supplements to Study 3

Study 3 Stimulus Selection Procedures.

Male faces. Fifteen photographs of female faces were selected from the Karolinska Directed Emotional Faces database (KDEF; Lundqvist, Flykt, & Öhman, 1998). Each photograph was of a different male, Caucasian model, directly facing the camera, with a neutral facial expression. Models that had obvious blemishes or other skin problems (which could theoretically elicit disgust in and of themselves) were excluded.

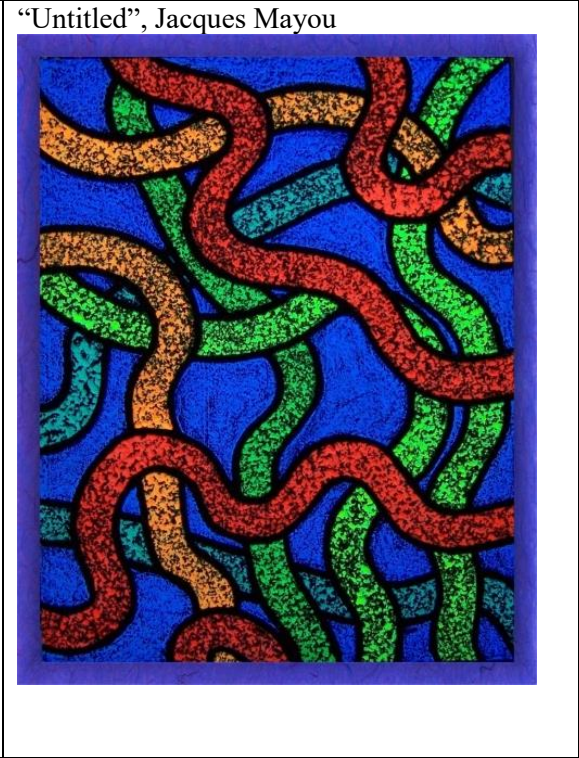
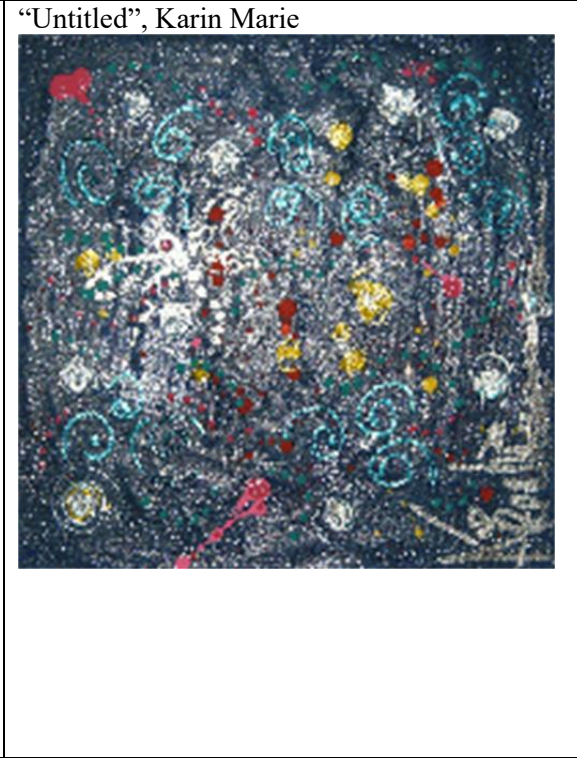
Abstract art. Works of abstract art were obtained from abstractartist.com, an online gallery of work by relatively unknown abstract artists. Each artist had a sampling of abstract paintings on their page, so we assigned each artist a number, then assigned a number to each painting on their page. We then generated, in sequence, two random numbers using a random number generator on random.org, first to select an artist, and second to select one of the artist's paintings. Two additional rules were applied: i) there could be no repeated artists; if an artist was selected twice, we ran the procedure again; and ii) there could be no representational content in a painting (e.g., human figures, distinguishable objects, etc.); if there was, we ran the procedure again. The procedure was performed until we had 15 abstract paintings that were devoid of representational content, each from a separate artist.

Landscapes. The procedure for obtaining the landscape paintings was similar to the procedure used for the abstract art. A different website, fineartamerica.com, was used. We searched the site for "landscapes," which brought up over 10,000 landscape paintings split into pages of roughly 34 paintings. To keep the selection task manageable, we sorted the paintings randomly, then restricted our search procedure to the first ten pages. We used a two-stage randomization procedure like with the abstract paintings: a random number from 1-10 was generated first, to select a page number, followed by a second number 1-34 to select the painting. If the selected painting contained animals, people, food or other possible core

disgust elicitors it was rejected and we ran the procedure again. Landscapes with man-made subject matter (e.g., farm houses) were included as long as they also contained natural elements (e.g., fields, trees, etc.). We rejected any paintings containing nationalistic emblems (e.g., flags). No repeated artists were allowed. This procedure was followed until we had 15 distinct landscapes.

Portraits. The portraits were obtained from the Web Gallery of Art, www.wga.hu. We searched for “portrait” within the “painting” category on the website. This generated a count of 200 pages. First, we generated a random number between one and 200 to narrow the search to one page, and then we selected a random painting from that page. The portrait had to contain only one adult human subject, fully clothed, with at least three-quarters of their face visible, or it was rejected. Also, the portrait had to have been painted between 1450 CE and 1700 CE, or it was rejected. This time-period criterion was applied to standardize the form and style of the artwork. No repeated artists were allowed. This procedure was followed until we had 15 distinct portraits.

Table S.1 Abstract Art from Study 3.



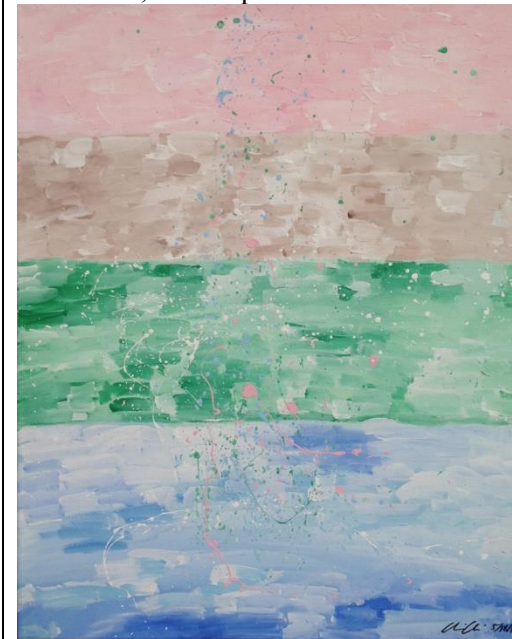
“Untitled”, Jeanie Morris



“Blood Orange Burst”,



“Untitled”, Christopher Chavoustie



“Recluse”, David Douthat



“Untitled”, David Piper



“Untitled,” Paul McGuire



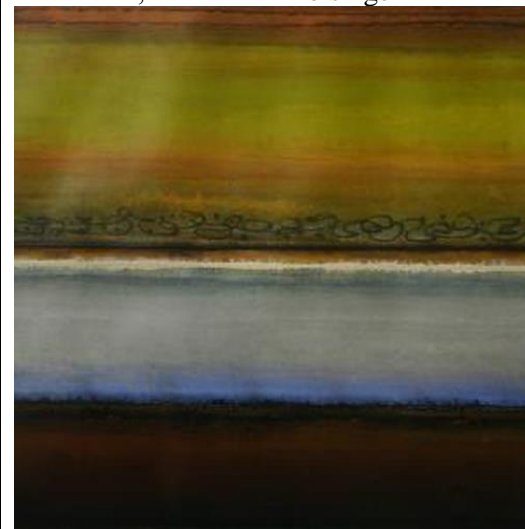
“Untitled”, Rod Schneider



“Untitled”, Joanne Tarlin



“Untitled”, Joel David Holsinger



“Untitled”, John Silverton



“Untitled” Stephen Ellison



“From the Top”, Jane Cooper



Table S.2. Portraits from Study 3.

“Self-Portrait in a Window”, Gerrit Dou



“Portrait of Emperor Rudolf II”, Hans von Aachen



“Portrait of a Woman”, Vittore Carpaccio



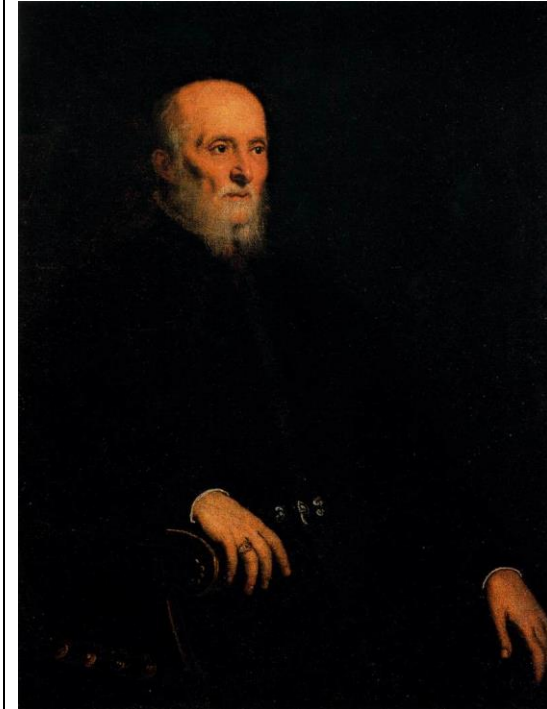
“Portrait of Anna Codde”, Maerten van Heemskerck



“Herman Doomer”, Rembrandt



“Portrait of Alvise Conaro”, Tintoretto



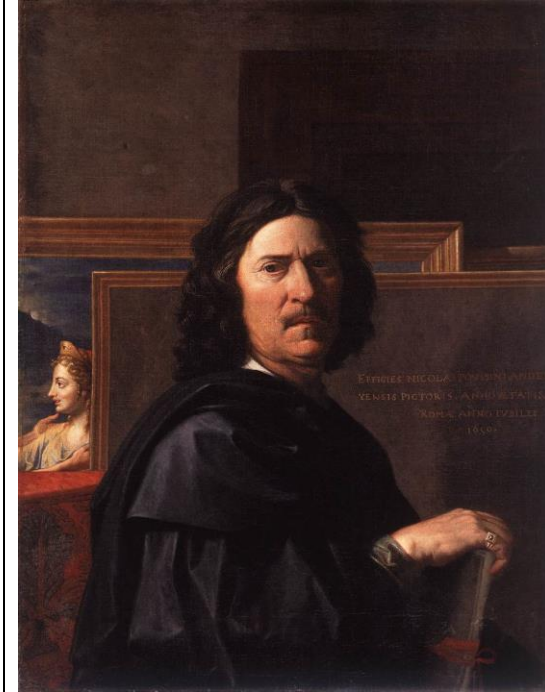
Portrait of a Youth", Giorgione



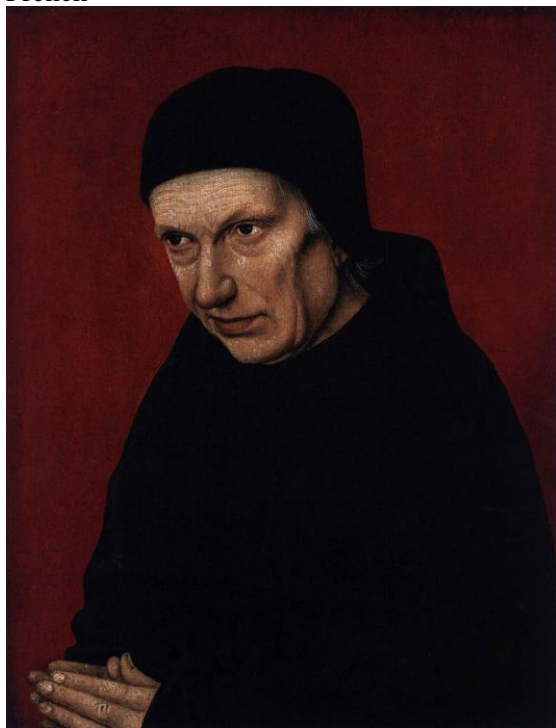
"De Vos san Steenwijk", Hans Holbein the Younger



"Self-Portrait", Nicolas Poussin



“Portrait of an Ecclesiastic”, Unknown Master,
French



“Portrait of a Woman”, Franz Hals



“Portrait of a Gentlewoman”, Jacob Jordaens



“Portrait of a Woman”, Nicolaes Maes



“Portrait of a Young Man in Senator’s Garb”,
Giovanni Bellini



“Head of a Young Man”, Lorenzo Lotto



Table S.3. Landscapes from Study 3.

“The Ride Home”, William Brody



“Sunday Afternoon at Castle Combe”, Raluca Nedelcu



“Piccole Case Bianche de Grecia”, Guido Borelli



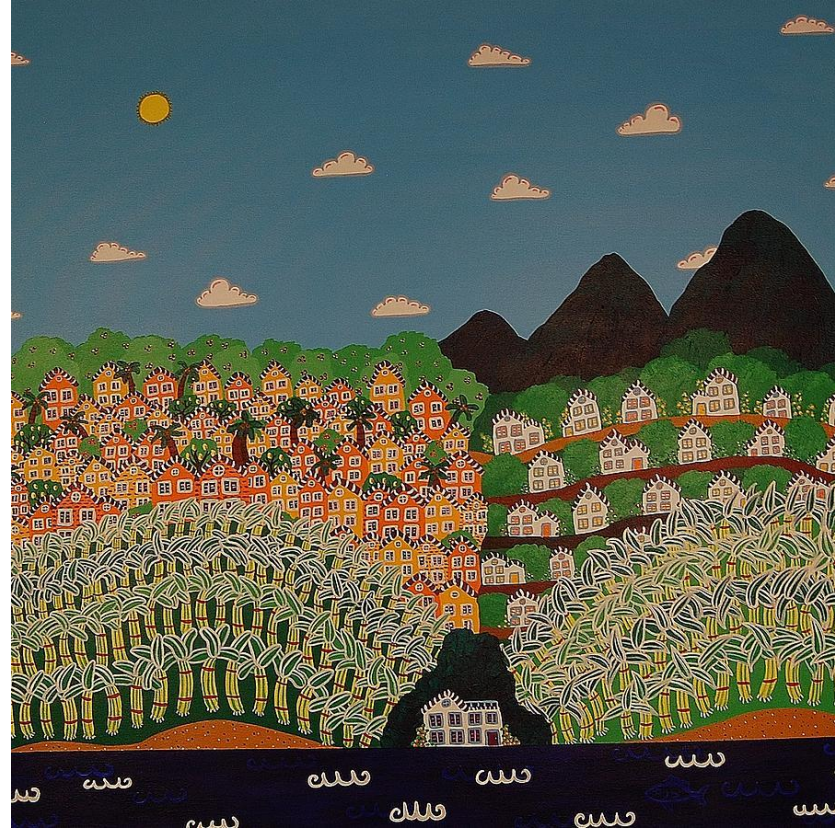
“Riverbend Park2 Boats at the Aquaduct”, Darcie Pike



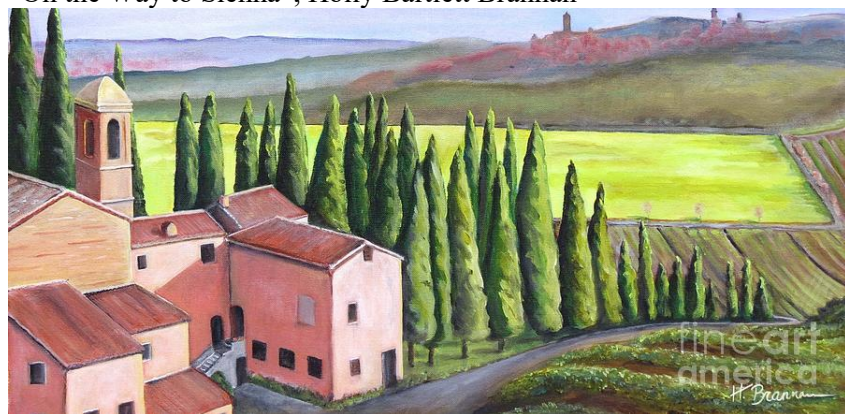
“Take Me Home”, Doris Chou



“Jamaican Landscape”, Wendy Bridges



“On the Way to Sienna”, Holly Bartlett Brannan



“Sea”, Desislava Ivanova



“The Boatworks Port Carling”, Deb Griese



“California Dreamin’”, Liz Borhuis



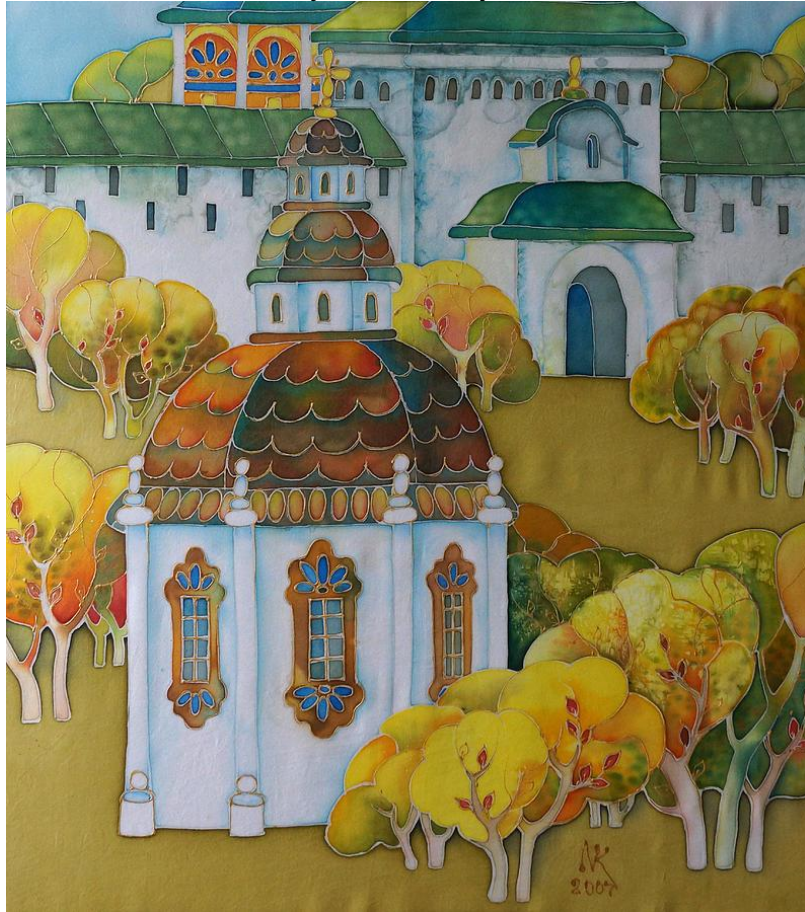
“Fishing Village” – Halina Plewak



“Golfe De Juan Les Pins”, Mircea Caraman



“At An Ancient Monastery – 1”, Khromykh Natalia



“Province House” – Marshall Desveaux



“Wyoming Barn in Red”, Cheryl Fecht



Emotion Regulation Questionnaire

This study also included an individual difference measure of emotion regulation, the Emotion Regulation Questionnaire (ERQ; Gross & John, 2003), to assess in an exploratory manner whether the tendency to reappraise one's emotions might moderate any relationship between DS and aesthetic judgments (see Feinberg, Willer, Antonenko, & John, 2012). The ERQ consists of ten items assessing two different emotion-regulation strategies: reappraisal (e.g., "When I want to feel less negative emotion, I change the way I'm thinking about the situation"; 6 items, $\alpha = .88$) and suppression (e.g., "I control my emotions by not expressing them"; 4 items, $\alpha = .83$). Reappraisal is focused on altering the cognitive aspect of an emotional experience (e.g., reinterpreting the meaning of an event to reduce the experience of an emotion), whereas suppression involves inhibiting emotion displays, but not the affective experience. We were particularly interested in reappraisal, thus, in this study we focused exclusively on the reappraisal subscale, to test it as a moderator of DS and aesthetic judgments.

We tested for any moderating effects of emotion reappraisal on faces and portraits (the two sets of stimuli in which DS had a significant relationship). DS-R and reappraisal scores were standardized and an interaction term was computed (i.e., DS-R x reappraisal) and included in two separate linear regressions, along with main effects of reappraisal and DS, predicting aesthetic ratings of faces and portraits. The tendency to reappraise failed to act as a moderator of DS for faces, $p = .74$, or portraits, $p = .82$; reappraisal was also a non-significant predictor on its own for both ratings, $ps > .34$. DS predicted more critical aesthetic judgments of faces, $\beta = -.12$, $p = .039$, and portraits, $\beta = -.15$, $p = .011$, independent of reappraisal tendencies.

Supplements for Study 4

IAPS Codes for Moral Judgment Block

2683; 6312; 6315; 6821; 9800; 9810

IAPS Codes for Emotion Sensitivity Block

Disgust: 1271; 9140; 9290; 9300

Anger: 2272; 2751; 6520; 6836

Fear: 1120; 1201; 1525; 8485

Sadness: 2141; 2205; 2276; 2900

Arousal: 5920; 5940; 8160; 8475

Negativity: 2688; 3220; 9000; 9530

Selection Procedure for Emotion Sensitivity Images

Disgust. The four disgust images were chosen from an initial set of eight images that we judged to depict canonical disgust elicitors. We narrowed this set to four, with the goal of depicting a range of elicitors (insects, decay, garbage, bodily waste). On the basis of prior norming studies of the IAPS, this set of images is quite negatively valenced ($M = 2.63$ on a 1-9 scale, with lower numbers indicating negative valence) and moderately arousing ($M = 5.29$)

Anger. Anger is typically evoked by normative content, so we selected these four images from the ten-image moral judgment scale used in Supplemental Study 4. In particular, we selected four items that depicted conceptually different anger elicitors (children ostracizing another child, a person drinking and driving, a person about to be stabbed, and apparent police brutality). The remaining six items were retained as the moral judgment scale. Re-analysis of Supplemental Study 4 found that this six-item scale showed good internal reliability in that study ($\alpha = .70$), so we were confident that it would do so in Study 4,

as well. The four-item anger scale was negatively valenced ($M = 3.14$) and moderately arousing ($M = 5.47$). It was comparable to the disgust scale on these dimensions, despite their very different content.

Fear. Fear items were chosen from an initial set of 38 images judged to depict fear-eliciting content. We chose images that were negatively valenced ($M = 3.29$) and highly arousing ($M = 6.57$), as this is typically taken to be the phenomenological experience of fear.

Sadness. Sadness items were chosen from an initial set of 7 images depicting expressions of grief. We chose images that were negatively valenced ($M = 2.38$) and relatively low on arousal ($M = 4.81$).

Arousal. For this scale, we chose four images that were highly arousing ($M = 6.50$), but middling in their valence ($M = 4.83$), to isolate the effects of a propensity to experience arousal, independent of positive or negative valence.

Negative affect. Similarly, for this scale, we chose four images that were negatively valenced ($M = 2.68$) and middling in terms of arousal ($M = 5.19$), that were not clearly related to any of the more differentiated emotions above.

Supplemental Study 1

Method

Participants. Exclusions for incomplete responses and failed Captcha verifications left a sample of $N = 307$. We embedded an attention check measure within the survey; four participants failed the attention check, and thus we omitted from the analysis, leaving a final sample of $N = 303$ (40% female, $M_{Age} = 33.29$ years, range: 18-74 years).

Materials and procedures. The same moral, conventional, and imprudent actions from Study 1 were used in this study. The order of presentation of all 21 actions was randomized for every participant. For each action, participants rated how wrong the action was and how much they disapproved of the action on five-point Likert scales. They then indicated whether the action should be allowed. Participants who stated that the action should not be allowed were then asked a follow-up question about whether the act would be “OK or not OK” if an authority figure (the school principal) authorized it – a measure of moralization of the action (Turiel, 1983). These measures were identical to those used by Chapman and Anderson, with the exception of the disapproval scale, which we added. Although judgments of wrongness and disapproval were highly correlated for every item (see below), we did not aggregate the wrongness and disapproval measures to aid comparison with Chapman and Anderson’s study. After responding to the 21 actions, participants completed the DS-R, the Emotion Reactivity Scale, and our novel Emotion Use in Moral Judgment Scale, in a counterbalanced order (see below for discussion of these additional measures). They then completed a brief demographic survey and were debriefed, thanked, and paid.

Moral transgressions. Composite wrongness ratings and disapproval ratings of the moral transgressions showed good internal reliability ($\alpha = .83$ and $.84$, respectively) so we

averaged across the eight scenarios to form composite measures of wrongness and disapproval.

Conventional transgressions. Composite wrongness ratings and disapproval ratings of the conventional transgressions showed good internal reliability (α s = .86 and .85, respectively) so we averaged across the eight scenarios to form composite measures of wrongness and disapproval.

Imprudent actions. Composite wrongness ratings and disapproval ratings of the imprudent actions showed acceptable internal reliability (α s = .69 and .67, respectively) so we averaged across the five scenarios to form composite measures of wrongness and disapproval.

Disgust sensitivity. For direct comparisons with Chapman and Anderson (2014, Study 2), we used the Disgust Scale-Revised (DS-R; Olatunji et al., 2007). In the present sample, scores ranged from 2.50 to 22.50, with a mean of 13.14 (SD = 4.54).

Emotion Reactivity Scale. Chapman and Anderson (2014) found that the relationship between DS and moralization of conventional rules held even after statistically controlling for measures of trait anger and trait anxiety, measured via the Trait scale of the Spielberger State-Trait Anger Expression Inventory (Spielberger, 1998) and the Multidimensional Anxiety Questionnaire (Reynolds, 2003), respectively. Chapman and Anderson included these measures in that study to address the possibility that the relationship between DS and moralization is unique and occurs independent of other negative emotions. In our study, we included a measure of chronic emotional arousal or reactivity, the Emotion Reactivity Scale (Nock, Wedig, Holmberg, & Hooley, 2008), which assesses the predisposition to experience emotions intensely, in response to a wide array of stimuli, and for a prolonged period of time. We included the ERS as an initial test of Hypothesis 2 (scope of emotions), as an attempt to show that more basic affective dimensions relate to moral evaluation. Yet in hindsight this

measure was not ideal because it assesses general patterns of emotional reactivity, whereas the DS-R assesses disgust sensitivity in response to *specific events*. The ERS is a 21-item measure. All the items load onto a single factor, chronic emotion reactivity, which the authors define as “the extent to which an individual experiences emotions (a) in response to a wide array of stimuli (i.e., emotion sensitivity), (b) strongly or intensely (i.e., emotion intensity), and (c) for a prolonged period of time before returning to baseline level of arousal (i.e., emotion persistence)” (p. 107). Some example items include: “I experience emotions very strongly”; “I am easily agitated”; “When something happens that upsets me, it’s all I can think about for a long time”; “People tell me that my emotions are often too intense for the situation”; “Even the littlest things make me emotional.” The 21-item scale showed strong internal reliability (Cronbach’s $\alpha = .96$). In previous research the ERS has been shown to correlate positively with measures of chronic depressive mood, fear, frustration, and aggression, and negatively with inhibitory control (Nock et al., 2008).

Emotion Use in Moral Judgment Scale. Six items were developed by the authors to assess the degree to which a person uses their emotions as input into their moral judgments. The items can be found in Table S.4 below (three items are reverse scored). Each item completed the following sentence stem: “When deciding whether someone’s behavior is right or wrong, moral or immoral...”. The internal consistency of the scale was good ($\alpha = .78$). Arguably, *emotion use* represents an emotion-regulation process distinct from reappraisal and suppression, the two most commonly studied emotion-regulation processes (see Gross & John, 2003; see also Study 3). We envision emotion use in the following manner. A person may experience an emotion (e.g., disgust) in the presence of an eliciting situation (e.g., two men kissing), but this does not necessarily mean that the observer utilizes the emotion when evaluating the situation or formulating a judgment (e.g., they might think, “there’s nothing wrong with two men kissing”). A person may deem the emotion irrelevant to their judgment

due largely to pre-existing, contravening moral attitudes and commitments. We contend that such a process is different from reappraisal and suppression insofar as the emotion is *disregarded*, not suppressed, and any attenuation of the emotion that occurs does so as a by-product of the moral judgment (e.g., “There’s nothing wrong with two men kissing”) and not via reappraisal of the focal event; that is, the perceiver does not attempt to alter the meaning of the event, but considers his or her emotions as irrelevant to or in conflict with his or her judgment (cf. Feinberg et al., 2012).

Table S.4

Emotion Use in Moral Judgment scale: Item means and standard deviations

<i>When deciding whether someone’s behavior is right or wrong, moral or immoral...</i>	<i>M (SD)</i>
I pay attention to what my internal bodily sensations are telling me.	2.81 (1.45)
I let my inner feelings decide.	2.55 (1.13)
I listen to my emotions rather than think dispassionately about it.	2.46 (1.12)
I ignore what I am feeling, and use my head instead.*	3.15 (1.13)
I try to set aside how I feel about it.*	2.97 (1.10)
I try to not let my emotions influence my decision.*	3.18 (1.17)

* Reverse scored. Measured on a 1-5 scale (1 = *Not at all like me*; 5 = *Completely like me*).

Cronbach’s alpha = .78.

Results

Zero-order correlations between DS, and the three evaluations made for moral transgressions, conventional transgressions, and imprudent acts are presented in the first row of Table S.5. DS correlated reliably with judgments of wrongness, disapproval, and moralization for moral transgressions, conventional transgressions, and imprudent acts (with

the exception of “wrongness” judgments for imprudent acts), largely consistent with Hypothesis 1.

Table S.5. Zero-order correlations ($dfs = 301$) between trait variables and judgment measures by domain (Supplementary Study 1).

	Moral			Conventional			Imprudent		
	Wrong	Disap.	Auth. Ind.	Wrong	Disap.	Auth. Ind.	Wrong	Disap.	Auth. Ind.
DS-R	.17**	.17**	.15**	.29***	.29***	.20**	.06	.12*	.15**
EUMJ	.09	.13*	.09	.07	.06	-.02	.03	.04	.04
ERS	.06	.08	.06	.04	.04	.08	.08	.11 [†]	.08
Pol. Cons.	-.07	-.11*	-.12*	.15**	.16**	.10 [†]	-.12*	-.11*	-.14*

[†] $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .001$. DS-R = Disgust Scale-Revised. EUMJ = Emotion Use in Moral Judgment scale. ERS = Emotion Reactivity Scale.

Additional Analyses. As can be seen in Table S.6, DS was correlated positively with general emotion reactivity (EMS) and the use of emotion in moral judgment (EUMJ). As seen in Table S.5, the correlations between EMS and EUMJ and judgments of wrongness, disapproval, and moralization were quite weak, rarely reaching statistical significance for any normative judgments. Political conservatism generally predicted harsher normative judgments of conventional violations, consistent with some prior research (Clifford, Iyengar, Cabeza, & Sinnott-Armstrong, 2015; Landy, 2016; Pennycook, Cheyne, Koehler, Barr, & Fugelsang, 2014; Royzman, Landy, & Goodwin, 2014), and less harsh normative judgments of imprudent actions, which seems reasonable, given the endorsement of personal liberty as a moral value among the American right.

Table S.6. Zero-order correlations between trait variables from Supplemental Study 1.

	2	3	4
1. DS-R	.28***	.35***	.13*
2. EUMJ	-	.32***	-.02
3. ERS	-	-	-.05
4. Pol. Conservative	-	-	-

$df = 301$. DS-R = Disgust Scale-Revised. EUMJ = Emotion Use in Moral Judgment scale. ERS = Emotion Reactivity Scale.

Discussion

In this study, we directly replicated the findings of Chapman and Anderson (2014) regarding the relationship between DS and judgments of moral and conventional transgressions. However, we also found, consistent with Hypothesis 1 (scope of evaluations), that disgust-sensitive individuals tend to make harsher judgments of imprudent actions. Our measure of general reactivity, the EMS, was mostly unrelated to the evaluative judgments in this study. However, as discussed above, this is a measure general affective tendencies, rather than a measure of reactions to specific events. Thus, it does not share the same level of specificity shared between the DS-R and the evaluative judgments. When this issue of specificity was dealt with in Studies 1, 4, and Supplemental Study 3, we found clear evidence for Hypothesis 2 (scope of emotions).




Supplemental Study 2

Method

Participants. Exclusions for incomplete responses and failed Captcha verifications left a sample of $N = 200$ (41% female, $M_{age} = 32.02$ years, age range: 19-64 years).

Materials and procedures. Participants viewed two blocks of 15 images each (female faces and abstract paintings). The order of the two blocks, and the images within each block, was counterbalanced. Female faces were selected from the KDEF using the same procedure as the male faces in Study 3 (see above). Abstract paintings were selected using the same procedure as the abstract art in Study 3, with the restriction that no artist's work could appear in both studies (see Table S.8 below for images). For each image, participants rated how attractive they found it and how much they liked it on Likert scales ranging from -6 to 6. After rating the 30 images, participants responded to the DS-R, then responded to a brief demographics survey and were debriefed, thanked, and paid.

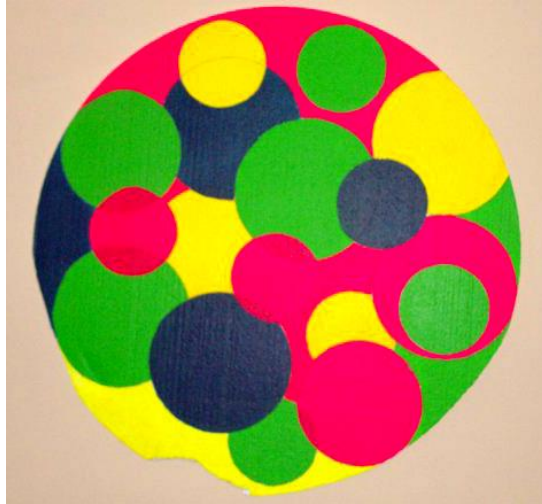
Table S.7. Abstract Art from Supplementary Study 2.

<p data-bbox="203 272 510 300">"Untitled", Sandy Abbott</p> 	<p data-bbox="808 272 1178 300">"Soul on Fire", Eric Siebenthal</p> 	<p data-bbox="1391 272 1704 300">"Pier 50", Holly Anderson</p> 
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“Untitled”, Richard Todd



“Untitled”, Al Walz



“Untitled”, Devin Balara



“Untitled”, Celeste Heery



“Untitled”, M. Joyce Athey



“Untitled”, Paul Seftel



“Untitled”, Svein Koningen



“Blue Wave”, Doug Dubuclet



“Untitled”, Brenda Hope Zappitell



“Untitled”, Denton Loomis



“Untitled”, John Loveless



“Untitled”, Jeanne Besette



Results

Preliminary analysis. Composite attractiveness and liking ratings of the faces and abstract art (α s .86-.95) were highly correlated, $r(198) = .95$, $p < .001$, so we averaged across them to form one composite aesthetic evaluation of each type of stimulus. On average, the faces were rated on the scale midpoint of zero for attractiveness ($M = 0.03$, $SD = 1.84$), $t(199) = 0.23$, $p = .814$), while the abstract art was rated significantly above the scale midpoint ($M = 0.68$, $SD = 1.68$), $t(199) = 5.73$, $p < .001$).

Main analysis. Overall, there was a significant negative correlation between DS and attractiveness ratings for the faces, $r(198) = -.15$, $p = .035$, and a significant positive correlation between DS and attractiveness ratings for the abstract paintings, $r(198) = .15$, $p = .036$.

Discussion

In a nearly direct replication of Study 3, we again found a negative relationship between DS and aesthetic ratings of human faces (which were female, rather than male, in this study), supporting Hypothesis 1 (scope of evaluations). We also found a significant positive correlation between DS and aesthetic ratings of abstract paintings. The latter result is consistent with the general extremity view, while the latter finding is theoretically neutral, because the faces were rated, on average, precisely on the midpoint of zero. The mean attractiveness rating did not differ significantly from zero, thus, no directional prediction can be reliably made. However, the results of both Study 4 and Supplemental Study 3 supported the general extremity view, so we favor this view, on balance. Most importantly, neither result supports the moral disgust view.

Supplemental Study 3

In this study, we examined the relationship between DS and evaluations of positive moral actions. The general extremity view predicts that DS will be associated with more positive (i.e., extreme) moral evaluations of such actions, consistent with Hypothesis 1 (scope of evaluations). A general negativity view predicts that DS will be associated with more negative moral evaluations. It is not clear what the moral disgust view predicts. As in Study 4, we included image-based measures of sensitivities to several emotional states. The general extremity view predicts that these other affective sensitivities should also predict more positive moral evaluations, consistent with Hypothesis 2 (scope of emotions).

Method

Participants. After exclusions, we retained a final sample of $N = 250$ (46% female, $M_{age} = 34.81$ years, age range: 19-74 years).

Materials and procedure. Sensitivity to disgust, anger, fear, sadness, arousal, and negative affect were measured using the same image-based scales as in Study 4. Moral judgments were made in response to seven morally good actions, adapted from Wiltermuth, Monin, and Chow (2010). We set each action in a school context, to keep them comparable to the stimuli in Study 1 and Chapman and Anderson (2014). For each action, participants rated how morally praiseworthy it was and how much they approved of it, on 1-9 scales (1 = “Not at all”; 9 = “Extremely”). Order of presentation of the seven actions was randomized for each participant, and the order of the two blocks was counterbalanced, with the four-image emotion sensitivity scales presented as six sub-blocks. After completing both blocks, participants responded to a short demographics questionnaire.

Praiseworthy Actions from Supplemental Study 3.

A student tells the cafeteria cashier that she received too much change back, rather than keeping the extra money.

A student helps his fellow classmates by working on several volunteer school organizations.

A student volunteers in a soup kitchen after school.

A student campaigns against bullying in her school.

A student gives her utmost effort when she commits to performing a task for the school drama club.

A student gives generously to the school fundraiser working to eradicate hunger in the community.

A student goes out of his way to be friendly to a student who is not popular at school.

Results and Discussion

As in Study 4, we created six composite measures of emotion sensitivities by averaging across the four items in each scale (α s = .72-.89). Composite praiseworthiness and approval ratings across the seven actions (α s .92 and .94, respectively) were highly correlated, $r(248) = .83, p < .001$, so we averaged these judgments together to form one composite praise measure. Unsurprisingly, these actions were rated as quite morally positive ($M = 7.50, SD = 1.33$), so the general extremity view predicts that emotion sensitivities should positively predict moral praise.

Consistent with general extremity view, and inconsistent with the general negativity view, sensitivity to disgust, anger, fear, sadness, arousal, and negative affect were all positively correlated with moral praise, $r_s(248) = .38, .39, .32, .44, .29, \text{ and } .41$, respectively, all p s $< .001$. This result is also consistent with Hypothesis 2, in that a wide array of affective sensitivities were related to this moral judgment. It is worth noting, however, that the moral disgust view has typically been articulated with respect to judgments of moral condemnation, not praise, so it is unclear what results this perspective would predict in this study. The more important contribution of this study is to pit the predictions of the general extremity and general negativity views against one another. The results clearly favor the general extremity view, consistent with Study 3.

Supplemental Study 4

Method

Participants. We recruited a new sample of participants located in the United States through Amazon Mechanical Turk. Two hundred-eighty participants began the study. After exclusions, we retained a final sample of $N = 253$ (37.5% female, $M_{age} = 34.57$ years, age range: 20-75 years).

Materials and procedure. Participants viewed ten images drawn from the IAPS (Lang, Bradley, & Cuthbert, 2008), each depicting a pathogen-free immoral act (e.g., a black child being socially excluded by white children; a physical altercation between a man and a woman, see Supplemental Materials for identification numbers). These ten images consisted of the six moral judgment images from Study 4, and the four images that comprised the anger scale in Study 4. Participants rated how wrong each depicted action was on a seven-point scale (1 = “Not at all wrong”, 7 = “Extremely wrong”). Emotion sensitivities were also measured using an image-based method. Participants viewed eight IAPS images depicting pathogen-linked disgust elicitors (e.g., cockroaches, filthy toilets) and rated how much each image made them feel each of four emotion terms on a 1-9 scale (1 = “Not at all”, 9 = “Extremely”): “grossed out”,¹ “angry”, “negative” (a measure of valence), and “tense” (a measure of arousal). The eight images included the four-image disgust scale from Study 4, and four additional images (see below for code numbers). Most of the emotion terms from Studies 1 and 4 behaved quite similarly, so we used a truncated set of emotion terms in this study for the sake of brevity. The order of the moral judgment and emotion sensitivity blocks was counterbalanced, and the images in each block were presented in a new randomized

¹ A pre-test showed that “grossed out” ratings of these images correlated highly with scores on the pathogen subscale of the TDDS, $r(291) = .70$, $p < .001$, which provides assurance that this is a valid measure of DS.

order for each participant. After completing both blocks, participants responded to a brief demographics questionnaire.

IAPS codes for moral judgment block. 2272; 2683; 2751; 6312; 6315; 6520; 6821; 6836; 9800; 9810

IAPS codes for emotion sensitivity block. 1271; 1280; 9140; 9180; 9290; 9300; 9320; 9373

Results and Discussion

Emotion ratings ($\alpha = .88-.91$) were averaged across the eight images to form composite measures of sensitivity to disgust ($M = 5.35$, $SD = 1.80$), anger ($M = 3.52$, $SD = 1.94$), negative valence ($M = 4.65$, $SD = 2.00$), and arousal ($M = 4.01$, $SD = 2.11$). Wrongness ratings across the ten images ($\alpha = .74$) were also averaged together. On average, the actions depicted were rated above the scale midpoint of 4 (labeled “Moderately wrong”), $M = 5.49$, $SD = 0.82$, $t(247) = 28.84$, $p < .001$, as would be expected.

Consistent with Study 1 and prior research, disgust sensitivity correlated with wrongness ratings, $r(252) = .38$, $p < .001$. However, sensitivity to anger, negative affect, and arousal also showed significant, and comparably-sized, correlations with wrongness ratings, $r(252) = .29$, $.34$, and $.29$, respectively, all $ps < .001$. This constitutes additional evidence in support of Hypothesis 2 – the relationship between DS and moral evaluation is not unique among affect.

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