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Socio-moral disgust and its relation to the disgust system

David Sparkman
Eastern Michigan University

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SOCIO-MORAL DISGUST AND ITS RELATION TO THE DISGUST SYSTEM

By

David Sparkman

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Silvia von Kluge, Ph.D, Supervising Instructor

Stephen Jefferson, Ph.D, Honors Advisor

Carol Freedman-Doan, Ph.D, Department Head

Rebecca Sipe, Ph.D, Honors Director

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Abstract

The present study investigated the hypothesis that an elicitor of core disgust will potentiate the severity of individuals' assessments of socio-moral transgressions. This hypothesis is conceptually supported by the theory of preadaptation, which suggests that, through the process of evolution, basic behavioral systems gradually expand to incorporate responses to increasingly complex stimuli. A sample of 50 undergraduate psychology students (42 female, 8 male) were exposed to either a noxious odor, a pleasant odor, or no odor, and asked to assess the extent to which situations representing the four disgust domains (i.e., core disgust, animal origin disgust, interpersonal disgust, and socio-moral disgust) evoked the emotion of disgust. Results indicate that the odors had no effect on the domains of disgust, although there was a statistical difference among mean ratings of each domain. Implications of this research suggest that socio-moral disgust may not be a unified domain within the disgust system. Assessments of several conceptualizations of moral emotions and moral judgments are also considered.

Keywords: core disgust, socio-moral disgust, preadaptation, moral emotions, moral judgments

Socio-moral Disgust and its Relation to the Disgust System

In a July 2011 political opinion poll, the Pew Research Center asked, “If you had to use one word to describe your impression of the budget negotiations in Washington, what would that one word be?” This question was in response to the tumultuous political gridlock regarding whether the federal government should raise the debt limit or default on its financial obligations. Although respondents of the opinion poll most frequently answered the question with the word “ridiculous,” the second most frequent word to describe the debt debates was “disgust/disgusted/disgusting” (Pew Research Center, 2011). Barring any partisanship, the relatively high frequency of the word *disgust* and its other variations indicates that some individuals experienced negative emotions related to the political disagreement. To what extent does this usage of the word *disgust* accurately reflect the actual emotion of disgust? For instance, are respondents of this poll reacting to political intransigence akin to the way they would react to a bad odor, a cockroach, or vomit?

Research suggests that this may not be the case, as there is a discrepancy between the common understanding and the theoretical conceptualization of the word disgust. Nabi (2002) established that the lay understanding of the word is actually an integration of disgust and anger, which is oftentimes misused to depict both emotional frustration and revulsion toward an object or situation. This finding might also suggest why respondents of the Pew Poll frequently chose other words such as “stupid/stupidity” and “frustrated/frustrating,” along with the most frequent word “ridiculous,” to articulate judgments that are centered around feelings of agitation. The phrase “grossed out,”

however, more accurately defines the theoretical form of core disgust, which encompasses revulsions toward objects that have implicit biological determinants. Regardless of this word inaccuracy, there is a prevailing notion in the psychological literature that suggests the emotion of disgust has a role in judgmental or moral convictions.

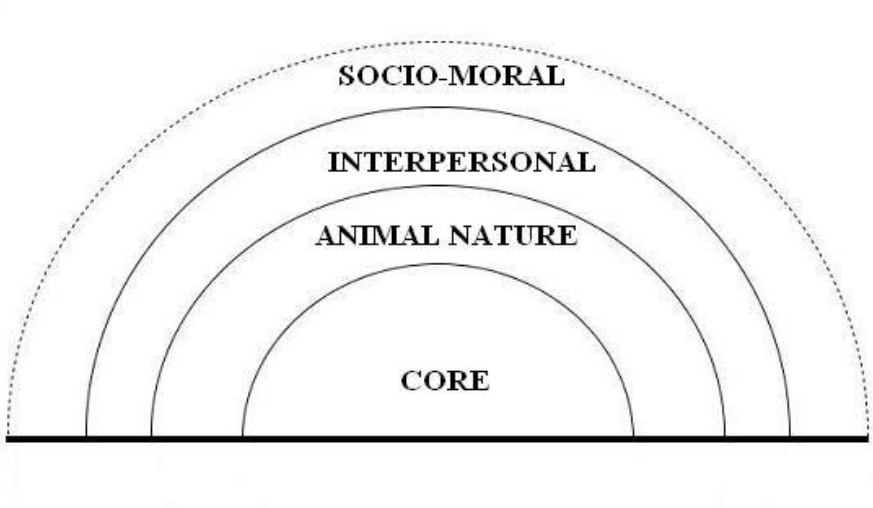
Disgust

Despite evolving considerations of emotions and their specific qualities, most researchers believe that disgust is a basic emotion. One of the first to comment on disgust was Charles Darwin, stating that it is primarily related to an intense, perhaps instinctual, revulsion to stimuli that are offensive to the senses (1872/1965). Aurel Kolnai speaks of disgust in terms of *intentionality*, or the idea that disgust is directed toward an offensive object and its proximity to the subject. In terms of this subject-object relationship, there seems to be an inherent desire to remove the disgusting object from the environment in order to be left "in peace" (Kolnai, 2003).

The disgust response has a distinct facial expression with three characteristic components being (i) the mouth gape, (ii) retraction of the upper lip, and (iii) the nose wrinkle (Ekman & Friesen, 1978). These characteristics suggest the disgust response is specific to the mouth, which is considered by some to be the "gateway to the body" (Rozin & Fallon, 1987; Rozin, Haidt, & McCauley, 2008). Fear of orally incorporating offensive or harmful objects is the primary defensive function of disgust, but it may have come to include other domains. Paul Rozin, for example, suggests that disgust has evolved to incorporate increasingly expansive elicitors that fall within four categories:

(1) core disgust, (2) animal origin disgust, (3) interpersonal disgust, and (4) socio-moral disgust (see Figure 1). These domains should not be perceived as rigid, but rather general outlines to a system that utilizes permeable transitions from one domain to the next.

Figure 1: *Disgust System*



Core Disgust

Core disgust centers around the mouth and defends the individual from offensive or harmful foods, odors, insects associated with filth (e.g., cockroaches, worms, maggots, flies), fluids that have been discharged from the body (e.g., blood, phlegm, spit, vomit, feces), and certain animal products. Most elicitors of core disgust are seen as extremely repulsive items of decay and putrefaction, and the threat of direct or indirect contamination from these objects is the primary motivation for rejection (Rozin, Haidt, & McCauley, 2008).

Animal Origin Disgust

The domain of animal origin disgust focuses on the offensiveness of sex, poor hygiene, animals, body "envelope" violations, and death. What most of these elicitors have in common is their association to the animalistic origin of human beings. It is believed that humans are the only species burdened by the realization of their inevitable mortality, and to reduce this feeling of anxiety, we suppress things that point to our animal nature. When humans engage in sexual or unhygienic behaviors, for example, they tend to be perceived as animalistic and, therefore, as threats to our assumptions of human superiority (Rozin & Fallon, 1987). Mutilation, or violations of the sacred body envelope, are also repulsive, as "they are uncomfortable reminders of our animal vulnerability" (Rozin, Haidt, & McCauley, 2008). Fear of decay—and especially death—is at the core of our desire to uphold the boundary between human and animal. Notably, however, is the suggestion that it is not death in and of itself that is disgusting, but *life within death*, or decaying while simultaneously retaining qualities of life (Kolnai, 2003).

Interpersonal Disgust

Interpersonal disgust primarily serves to ward off potential contact, whether it is direct or indirect, with individuals that are dirty, strange, or undesirable. Disgust of the interpersonal form, like most others, stems from the fear of contamination, or the belief that "once in contact, always in contact" (Rozin, Millman, & Nemeroff, 1986). For this reason, some individuals proclaim a strong aversion to used clothing worn by strangers or undesirable people, and it is especially intensified if the owner of the clothing has

committed some immoral action or behavior. One very salient article of clothing that researchers have discovered is Adolf Hitler's sweater, to which individuals have shown an intense aversion (Rozin, Haidt, & McCauley, 1993).

Socio-moral Disgust

Much of disgust appears to involve the domain of animal origin and the attempt to disambiguate the boundary between humans and their animalness. Socio-moral disgust, however, differs from animal origin disgust in that it functions to regulate unacceptable human transgressions, rather than reminders of our animal nature. Because societies have become increasingly interdependent, the intentionality (i.e. proximity) of socio-moral transgressions can affect other social members on a large scale (Oum, 2010). Socio-moral violations can be perceived as any human-specific behaviors (e.g., fraud, betrayal, lying, racism) that disrupt the maintenance of a functioning societal network. Socio-moral disgust's primary function, then, is to protect society and the social order of its members (Rozin, Haidt, & McCauley, 1993). But the question remains: are socio-moral violations a component of the same disgust system that includes the former domains?

There is some evidence to suggest socio-moral disgust is not similar to other domains of disgust. For example, possible elicitors of socio-moral disgust do not correlate well with other elicitors of disgust and have since been removed from the Disgust Sensitivity Scale (Haidt, McCauley, & Rozin, 1994). However, using the same Disgust Sensitivity Scale that removed socio-moral violations, researchers discovered that disgust in the socio-moral domain may be judgment-driven, as higher disgust

sensitivity scores were related to the disapproval of gay individuals (Inbar, Pizarro, Knobe, & Bloom, 2009). Furthermore, research suggests there are biologically analogous correlates in the experience of core and socio-moral disgust. Pictures of neo-Nazis, for example, which have been described as socio-moral transgressors, produced a decrease in heart rate when presented to participants. This effect on the parasympathetic nervous system is a physiological response also associated with objects of core disgust (Sherman, Haidt, & Coan, 2007). In addition, research utilizing functional magnetic resonance imaging (fMRI) examined the neurological substrates of core and socio-moral disgust and discovered that, while there are discrete differences in how these two disgust domains activate particular regions of the brain, there are also some regions that overlap (Schaich Borg et al., 2008; Moll et al., 2005).

Socio-moral Disgust and Preadaptation

The relationship between socio-moral disgust and disgust in its more basic form can be explained in terms of preadaptation, the evolutionary theory that mechanisms can co-opt or increase the accessibility of related functions to an already existing system (Rozin, 1976). In terms of the disgust system, a common function among all disgust domains is the primary desire to reject objects from the individual. As the disgust system evolved and expanded, however, the basic rejection system remained, but it began incorporating rejections to more forms of undesirable entities (Rozin, Lowery, & Ebert, 1994). The expansion of the disgust system similarly modified the function of each domain, with each becoming more sophisticated in its purpose. For example, core

disgust's function of protecting the individual from offensive objects expanded to socio-moral disgust's function of protecting *society* and social order. But at what point does the domain of socio-moral disgust act independently from its core components and more like a judgment? Or does socio-moral disgust function as part of the same biological system that core disgust functions? Although investigation into this question is active, results are limited and conclusions are somewhat unclear.

Socio-moral Disgust as a Moral Emotion Component

The complexity of socio-moral disgust is suggested in theories that posit a blending of the emotions of anger, disgust, and contempt (Rozin, Haidt, & McCauley, 1993), referred to as the "hostility triad" (Izard, 1977). Furthermore, the unilateral lip raise, which is one component of the typical disgust facial expression, has a separate interpretation when it is independent of the other two facial expression components. The upper lip raise has been suggested to be a combination of anger, disgust, and contempt regarding stimuli in the socio-moral domain (Rozin, Lowery, & Ebert, 1994). A difference between core and socio-moral disgust domains, in particular, is suggested in research that posits socio-moral violations most strongly evoke disgust *and* anger, while core disgust most strongly evokes disgust (Simpson et al., 2006). Russell & Giner-Sorolla (2011) support this possibility with the presumption that disgust and anger respond to distinct criteria in moral situations. They proposed that moral anger is elicited by situations involving malevolent and intentional harm, while moral disgust is not necessarily elicited by these cues. Conversely, moral disgust was found to be elicited by

moral situations that only violated bodily borders. There also appears to be a separate cognitive appraisal process between moral disgust and anger, such that reactions to violations of bodily norms were more elaborative in anger than disgust. Tautological statements, such as “that is disgusting because it is disgusting,” more often represented responses of moral disgust toward bodily transgressions (Russell & Giner-Sorolla, 2011).

Moral disgust’s focus on bodily borders, as proposed by the latter research, suggests a significant theoretical relationship between socio-moral disgust and animal origin disgust. Some individuals, for example, report experiencing socio-moral disgust toward situations of sexual molestation and brutal murders (Rozin, Haidt, & McCauley, 1999). Both of these examples, however, can be reduced to actions that simply violate bodily norms typical of the animal origin domain. Sexual molestation is not only a sexual behavior with animalistic qualities; it implies that the sacred body is being violated by an aggressive intruder. In addition, murderers, which were also described by individuals as eliciting socio-moral disgust, oftentimes engage in mutilation of the body. Although it is claimed that these behaviors elicit socio-moral disgust, at the core of this interaction, individuals are responding to violations of the sacred human body and, therefore, may be experiencing animal origin disgust.

Delineating the Boundaries of Socio-moral Disgust

The primary purpose of this study is to investigate the boundaries of the domain of socio-moral disgust. That is, whether it acts independently from or is a component of the disgust system. To do this, we propose that the presence of core disgust elicitors will

potentiate the disgustingness of other domains. In other words, if all domains of disgust, including socio-moral, can be conceptualized as expanded versions of the core disgust domain, elicitors of core disgust should have a permeable effect on all domains.

This hypothesis has instances of support from past research. In one study, a relationship was established between the presence of disgusting stimuli and a propensity for participants to more austerely judge moral violations. Wheatley and Haidt (2005) made suggestions to hypnotized participants that two experimental words—*take* and *often*—were to be experienced with feelings of disgust upon identification. When these participants were asked to give their reactions to several morally-latent vignettes, the stories containing the words *take* and *often* were judged in a harsher manner than controls. Although the arbitrary words themselves, both semantically and phonetically, are not elicitors of disgust, it is important to note that the feeling of disgust experienced by the participants increased the severity of their judgments. Some of these vignettes included moral transgressions (e.g., bribery, stealing, greed) consistent with the domain of socio-moral disgust. Schnall et al. (2008) replicated the Wheatley and Haidt (2005) research, but instead utilized an actual elicitor of disgust—a malodorous "fart spray"—to influence individuals' emotional responses to moral situations. One experiment of the research discovered that participants in the presence of the malodorous spray criticized moral vignettes more severely than controls, suggesting that the mere presence of a disgusting smell engendered harsher reactions.

Although the previously mentioned research illustrates the effect disgust has on the nature of moral judgments, there is no research that systematically examines the

relationship among all four domains of the disgust system as proposed by Rozin and his colleagues. More specifically, research has not explicitly utilized the theory of preadaptation to suggest a nexus between core disgust and each subsequent disgust domain, most notably socio-moral disgust. A second goal of this research was specifically aimed at examining the domain of socio-moral disgust in and of itself. In doing so, we split the domain of socio-moral disgust into two subcategories: (i) "animal" socio-moral disgust and (ii) "human" socio-moral disgust. As previously mentioned, people often report experiencing socio-moral disgust in response to the sexual or bodily transgressions typified by sexual molestation and murder. It is possible, however, that these individuals are reacting to human-generated violations that are animalistic in nature (i.e., elicit animal origin disgust), and therefore report that the perpetrator is "socio-morally" disgusting. The emotional reaction, though, stems from the bodily violations, but the human violator is imbued with the sense of disgust.

In an attempt to delineate this phenomenon, the two subcategories of the socio-moral disgust domain are (i) sexual or bodily violations and explicitly performed by a human; or (ii) non-sexual or non-bodily violations (e.g., racism, mendacity, infidelity) and explicitly performed by a human (see Table 1). This addresses a major confound in current conceptualizations of socio-moral disgust, as this distinction has not yet been made. Therefore, we propose that the primary function of socio-moral disgust is to reject inappropriate behaviors that *only* humans can perform. Socio-moral disgust, then, may be rejecting immoral individuals in order to protect a civil and cooperative society. Our subcategory of "animal" socio-moral disgust, on the contrary, primarily functions to

reject behaviors that hint at the animalistic origin of the human species. By dissociating socio-moral disgust between sexual/bodily and non-sexual/non-bodily violations, we can more specifically assess participants' reactions to such situations. Therefore, a more accurate conceptualization of the domain of socio-moral disgust can be developed.

Table 1: *Socio-moral Disgust Split*

"Animal" Socio-moral Disgust	"Human" Socio-moral Disgust
Neighbor spreads herpes to numerous sexual partners	Politician defined by hypocrisy, infidelity
Man sexually molests seven-year-old child	Neighbor caught in blatant lie
Woman dismembers ten-year-old daughter	Boss commits treason for profit
Friend having incestuous relationship with brother	Lawyer seeking out accident victims in hospital
Nazis performing mass murders	Store clerk shouting racial slurs at customer

Note. These items appeared within the Disgust Questionnaire used in this study.

Eliciting Emotions through Ambient Odors

Much research has been conducted regarding the effects ambient odors have on behavior, specifically memory retrieval (Schab, 1990; Smith, Standing, & De Man, 1992) and the formation of emotionally-relevant memories (Herz, 1997), just to mention a few. As these two examples indicate, memory and emotional regions of the brain are closely related, both in interaction and location, to the olfactory system (Aggleton & Mishkin, 1986; Cahill, Babinsky, Markowitsch, & McGaugh, 1995). Perhaps for this reason, the presence of odorous stimuli can significantly influence the way in which individuals experience and process information. In one study, the presence of a citrus-scented cleaner

influenced participants to engage in behaviors and cognitions that focused on the concept of cleaning more often than participants not primed with the citrus scent (Holland, Hendriks, & Aarts, 2005). What is most interesting in this research, however, is that participants were not consciously aware of the odor's influence.

While this evidence suggests that the presence of odors can influence the way we think and behave, odors can also directly evoke both positive and negative emotional responses. For instance, one study examined the relationship between five specific odors and whether or not these odors evoked the six basic emotions (i.e., fear, disgust, anger, happiness, sadness, and surprise). In addition, the emotional responses of participants were simultaneously compared to their real time physiological responses and self-report measurements. The research concluded that vanillin and menthol, in particular, evoked more positive emotional responses than the other odorants, and that these more pleasant hedonic odorants were similarly correlated with positive physiological and subjective responses (Alaoui-Ismaïli et al., 1997). While there has been an array of odors studied, the smell of lavender has also been shown to evoke pleasant emotional responses in individuals (Vernet-Maury, 1999; Kiecolt-Glaser et al., 2008). Odors eliciting the disgust response, such as the unpleasant "fart spray" utilized in Schnall et al. (2008), were expected to evoke the disgust response in much the same fashion.

Method

Design

The experiment conducted was a 3 (condition) x 3 (emotion type) x 5 (disgust

domain) mixed design. The three conditions were between subjects, with each condition exposing the participant to a specific stimulus. The three emotion types and five disgust domains were within subjects, as each participant was exposed to all of these items within the Disgust Questionnaire. The levels of the independent variable (IV) within the experiment were (i) exposure to a positive odor, (ii) exposure to a negative odor, and (iii) exposure to no odor; and the dependent variable (DV) was responses, or scores, on the Disgust Questionnaire.

Participants

The study included 50 participants (42 female, 8 male) between the ages of 18 and 51 years old (M = 23.96, SD = 6.01), all of whom were undergraduate psychology students at Eastern Michigan University. Recruitment of participants occurred in two ways: verbal appeal and fliers posted around campus. Involvement in the study was strictly voluntary and with no incentive, unless professors awarded course credit for participation. No attrition was applicable, as all participants that began the study also completed the study.

Materials

Materials used in the experiment included a positive odor, a negative odor, and the Disgust Questionnaire (Appendix A). The negative odor was a fart spray, which conveys the qualities of malodorous bodily discharge typical of core disgust. The positive odor was the mixed smell of lavender, which was in a concentrated, liquid air freshener

form. Each odor was sprayed on three cotton balls that were situated above a folded paper towel, and they were presented to the participants in identical, airtight containers.

The Disgust Questionnaire is a 67-item survey that measures participants' reactions to specific situations, with several of the situations being modifications of items on the Disgust Sensitivity Scale (Haidt, McCauley, & Rozin, 1994). The order was randomized, but manually reordered if several similar situations occurred together. The items of importance in the questionnaire contain specific situations that are elicitors of the four disgust domains, with each situation asking the participant to rate the extent to which the scenario evokes the emotion of disgust. A domain is represented by five situations intended to elicit a particular form of disgust. Along with these disgust-specific situations, the questionnaire contains non-disgust situations, or events that may evoke happiness, surprise, or have a neutral influence. This should mitigate the effect of being continuously exposed to disgusting situations.

Procedure

Participants were instructed to meet in a prearranged room and time, with the entirety of the experiment taking place in this location. First, participants were greeted upon entering and asked to read and sign a consent form detailing the general outline and voluntary nature of the experiment. Next, participants were read a statement indicating that the object to be presented was a visual, auditory, tactile, or odor stimulus, and that the nature of the stimulus was pleasant, unpleasant, or neutral. After the statement was read, participants were exposed to the neutral stimulus or asked to "sniff" one of the

odors for about three seconds. The condition of each participant was randomly chosen by the role of a die, but reordered to ensure an equal number of participants were represented in each condition. Once one odor was utilized in an experiment, that odor remained in use throughout the day. This eliminated the possibility that remnants of both odors would mix and be received by participants. Between experiments (as they were often scheduled back to back), the door of the room was opened to allow some form of air ventilation. The three conditions are as follows:

Positive Odor Group (PO): Participants of this group were in one of the experimental conditions, in which the mixed lavender smell was presented to the participants. The purpose of the positive odor was to provide an additional comparison to the *NO* group and its possible effect on the Disgust Questionnaire.

Negative Odor Group (NO): Participants of this group were in the other experimental condition, in which a "fart spray" was presented to the participants. The negative odor is a core disgust potentiator and its effects were measured using the Disgust Questionnaire.

No Odor Control Group (CO): Participants of this group were in the control condition, in which a neutral stimulus was presented. The purpose of this group was to gain a baseline rating of items on the Disgust Questionnaire.

After the participants were exposed to the stimulus, they were asked to complete the Disgust Questionnaire, which took approximately 15-20 minutes. Once the participants finished the Disgust Questionnaire, they were instructed to place it

anonymously in a box and leave the room, thus ending their participation in the study.

Results

The experiment was a 3 (condition) x 3 (emotion type) x 5 (disgust domain) mixed design, and the data were ratings on our Disgust Questionnaire. The preliminary analysis was conducted using a mixed factor analysis of variance (ANOVA). Results showed that the odor conditions had no effect on the disgust domains: core disgust, $F(2, 47) = 1.21$, $p = .31$; animal nature disgust, $F(2, 47) = .08$, $p = .92$; interpersonal disgust, $F(2, 47) = .26$, $p = .77$; "animal" socio-moral disgust, $F(2, 47) = .20$, $p = .82$; "human" socio-moral disgust, $F(2, 47) = .50$, $p = .61$. For the means of each disgust domain by condition, see Figure 2. A second ANOVA indicated that the odor conditions had no effect on the happiness domain, $F(2, 47) = .19$, $p = .83$.

Although the odor manipulation made little difference in participants' responses, subsequent analyses revealed robust findings regarding mean differences among our domain measures. A within subjects ANOVA indicated a significant effect for disgust domain, $F(4, 46) = 25.43$, $p < .001$, Wilk's Lambda = .31. For mean ratings of each disgust domain, see Figure 3.

Figure 2:

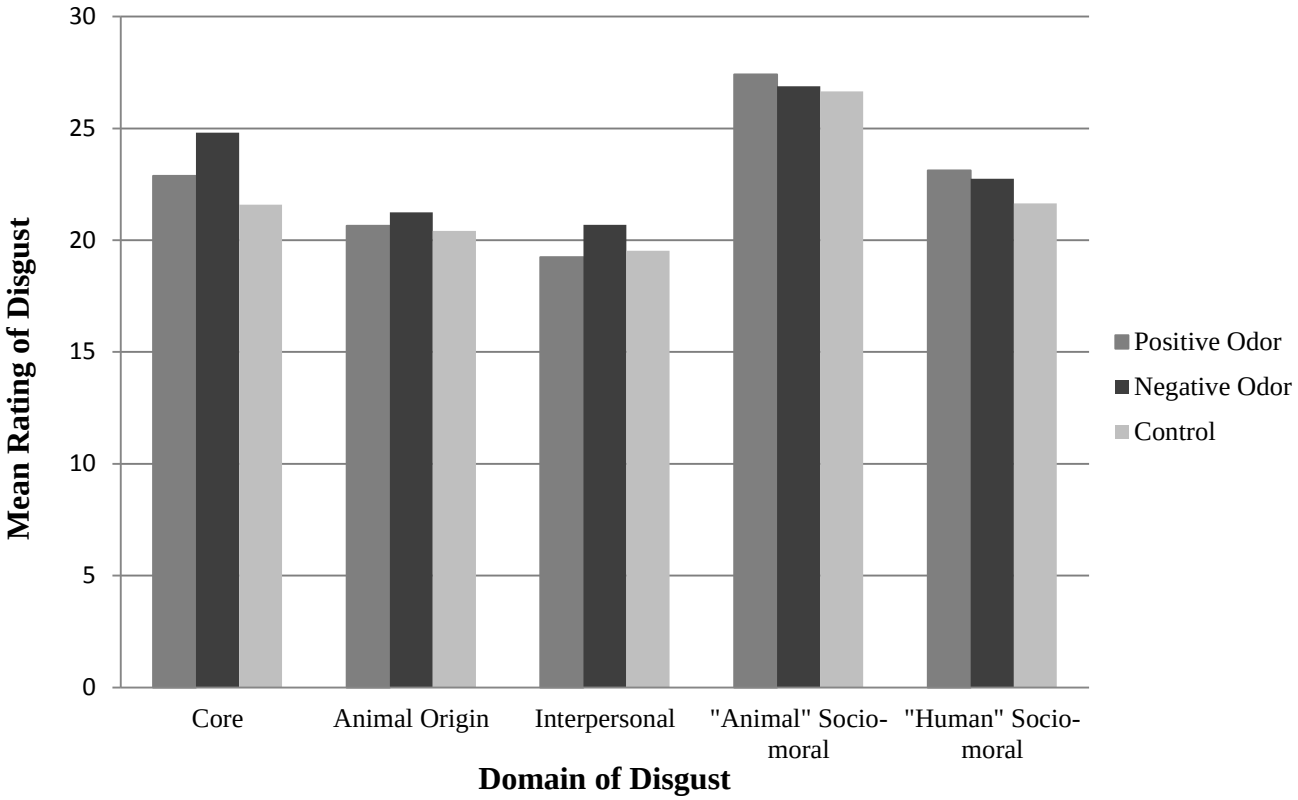
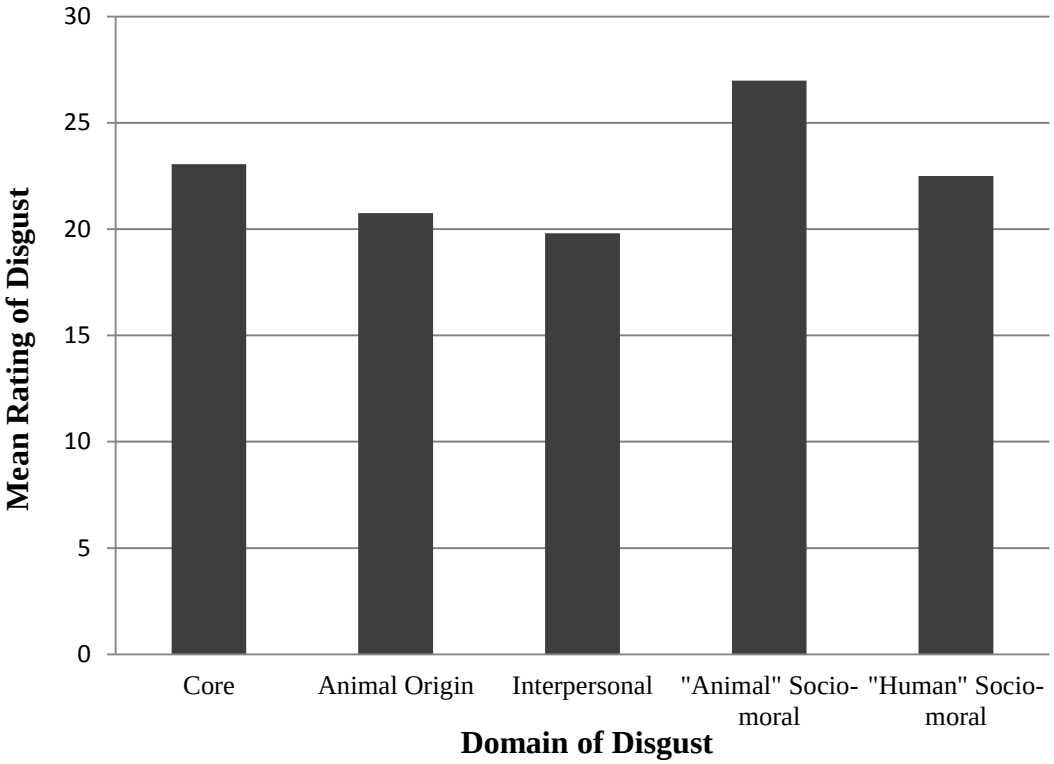

30
25
20
15
10
5
0
Mean Rating of Disgust
Core
Animal Origin
Interpersonal
"Animal" Socio-moral
"Human" Socio-moral
Domain of Disgust
Positive Odor
Negative Odor
Control

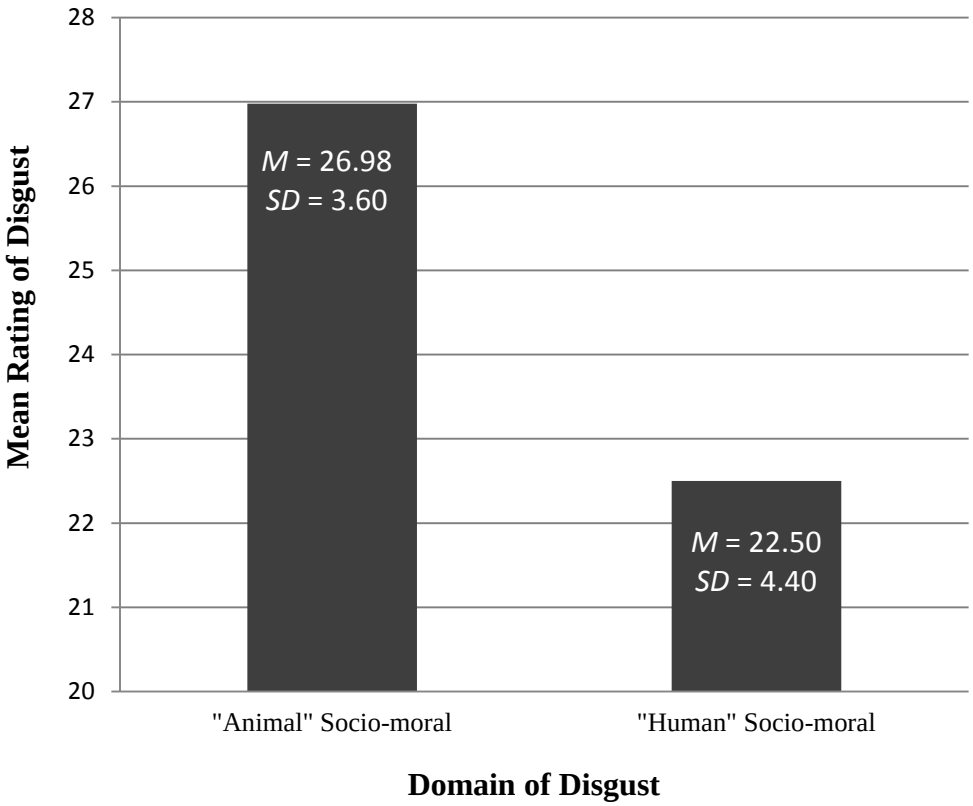
Figure 3:



Post hoc analyses using Fisher's least significant difference test showed that core, animal origin, interpersonal, and "human" socio-moral disgust measures all differed reliably from measures of "animal" socio-moral disgust, $p < .001$. Thus, subjects rated "animal" socio-moral disgust as significantly more disgusting than all other domains. An additional paired-samples *t*-test revealed a significant difference between mean ratings of "animal" socio-moral disgust and "human" socio-moral disgust, $t(49) = 7.70$, $p < .001$ (see Figure 4). The domains that did not differ significantly from one another were core disgust ($M = 23.06$, $SD = 6.00$) and "human" socio-moral disgust ($M = 22.50$, $SD = 4.40$), $t(49) = .78$,

p = .44; as well as animal origin disgust (M = 20.76, SD = 6.02) and interpersonal disgust (M = 19.80, SD = 5.98), $t(49) = 1.31$, p = .20.

Figure 4: *Ratings of "Animal" and "Human" Socio-moral Disgust*



Independent samples t-tests were conducted to assess gender differences in the various domains of disgust. Results show a significant difference between males and females in the domains of core, animal nature, and "animal" socio-moral disgust (see Table 2). However, the number of male participants (n = 8) was disproportionate to the number of female participants (n = 42). Independent samples t-tests were also conducted

to assess differences in political orientation in relation to the various disgust domains. Results suggest a significant difference between conservatives (M = 30.13, SD = 6.53) and liberals (M = 32.42, SD = 2.83), but only in the domain of "animal" socio-moral disgust, $t(48) = -1.58$, $p < .05$. However, it must also be noted that the amount of participants identifying as conservative (n = 8) was disproportionate to the amount of participants identifying as liberal (n = 36).

Table 2: *Gender Differences by Disgust Domain*

	Core	Animal Nature	Interpersonal	"Animal" Socio-moral	"Human" Socio-moral
Male	24.13 (8.73)	25.00 (8.85)	24.13 (8.03)	29.38 (6.74)	25.38 (5.45)
Female	28.82 (5.14)	25.90 (5.45)	24.93 (5.63)	32.48 (2.47)	27.90 (4.13)
	$t(48) = 2.10$*	$t(48) = .39$**	$t(48) = .35$	$t(48) = 2.34$**	$t(48) = 1.51$

Note. n = 8 for each male condition, whereas n = 42 for each female condition. *$p < .05$. **$p < .01$. Parentheses indicate standard deviation.

Construct Validity

Composite scores were formed to assess each of the disgust domains. That is, we merged the five items of each domain into a single disgust score. A reliability analysis was used to test the internal consistency of the various disgust measures. Cronbach's alpha, which measures internal consistency, assesses the extent to which individual items are related to one another as a group. The alphas for each domain are as follows: core

disgust = .80, animal nature disgust = .78, interpersonal disgust = .70, "animal" socio-moral disgust = .66, and "human" socio-moral disgust = .63. The alphas indicate that the domains of core, animal, and interpersonal disgust are relatively reliable scales. A composite score of the situations designed to evoke happiness was also created. Reliability analyses indicated that the happiness domain was a reliable scale, Cronbach's alpha = .84.

Discussion

The present study was conducted to assess the hypothesis that the presence of core disgust would potentiate individuals' reactions to other domains of disgust. This hypothesis was largely based upon the theory of preadaptation, which lends the suggestion that behavioral systems gradually expand to adapt the organism to increasingly complex stimuli (Mayr, 1960; Rozin, 1976). In terms of the disgust system, the most basic function of disgust (i.e., core disgust) is to reject physically offensive stimuli from becoming incorporated into the body. It is thought that our species has retained the basic aversive function of disgust, but has gradually extended this basic system to include rejections to other forms of stimuli. For example, stimuli that hint to our animalistic origins elicit animal nature disgust, individuals that possess physically offensive characteristics are suggested to elicit interpersonal disgust, and behaviors that violate standards necessary in maintaining a cooperative society are said to elicit socio-moral disgust. This theoretical framework allows the four discrete domains of disgust to be conceived as functionally analogous components within the disgust system. The most

significant aspect of this hypothesis is the possibility that, if the more complex domains essentially evolved from core disgust, a biological nexus exists between each domain of disgust and its core origin. That is, they can hypothetically be influenced by the basic nature of core disgust elicitors, such as the noxious odor utilized in the experiment.

Furthermore, the present study adds to the disgust literature in that it compares how individuals respond to elicitors of disgust, insofar as it relates to the four disgust domain model proposed by Paul Rozin and others (Rozin, Haidt, & McCauley, 1993). Recently, however, research has investigated the relevance of a Three Disgust Domain model, which is thought to function in evolutionary terms, rather than as an attempt to abate uncomfortable reminders of our animal origin. Items of the Three Disgust Domain model are categorized in relation to pathogens, sex, and morality (Tybur, Lieberman, & Griskevicius, 2009). Results of the present study may help formulate new considerations regarding the differences between Rozin et al.'s four disgust domain model and Tybur et al.'s Three Disgust Domain model.

The results of the present study show a significant difference among mean ratings of all domains of disgust except core disgust and "human" socio-moral disgust, as well as animal origin disgust and interpersonal disgust. The domain with the highest mean was the "animal" socio-moral domain, which we measured separately from the "human" socio-moral domain. This distinction was of particular interest because of suggestions in the literature that individuals experience socio-moral disgust toward perpetrators of murder and sexual molestation (Rozin, Haidt, & McCauley, 1999). The focus of disgust in these situations, however, can be separated between two emotional stimuli. The source

of disgust is either the human committing these acts or the nature of the acts themselves. Sexual molestation and murder, which involve violating sexual and bodily norms, can be thought of as elicitors of animal origin disgust. Therefore, we hypothesized that this particular experience of disgust was evoked not by the socio-moral "disgustingness" of the human perpetrator, but by the violation of sexual and bodily norms. The significant difference between ratings of "animal" and "human" socio-moral disgust elicitors suggests that these domains are not analogous. Further, it provides some evidence that past conceptualizations of socio-moral disgust are confounded. That is, previous experimental elicitors of socio-moral disgust usually include both sexual/bodily and non-sexual/non-bodily violations in the same construct, despite the fact that these categories were evaluated differently by participants in the current study.

The present data show that the "animalistic" behaviors performed by humans were rated as the most disgusting by participants. "Animalistic" behaviors can be defined as those that elicit animal origin disgust (e.g., sex, gore, violating the sacred body envelope), which is suggested to function to conceal our relatedness to animals and the certainty of death (Rozin & Fallon, 1987; Rozin, Haidt, & McCauley, 2008). That the behaviors described in the study were performed by humans is an interesting dynamic, in that it compounds the perception of animal origin elicitors. Although the elicitors within the domains of animal origin disgust and "animal" socio-moral disgust are fundamentally similar (i.e., they function to suppress reminders of the animal origin of the human species), participants did not assess them similarly. It is possible that a particularly visceral experience was evoked when individuals responded to situations in which

humans behaved *like animals*. That is, they engaged in behaviors that blurred the distinction between the human-animal boundary, such that the *humans themselves were animals.* Thus, participants rated these "animalistic" behaviors performed by humans as most disgusting.

The overall results of the study indicate that the odor manipulation had no effect on our various dependent measures of disgust. Specifically, there was no evidence suggesting that the presence of a noxious odor increases the severity by which individuals judge socio-moral transgressions. Nor was there evidence that the pleasant odors influenced participants' experience of happiness. The effect of a noxious odor on moral judgments, however, has been supported in past research by Wheatley and Haidt (2005) and Schnall et al. (2008), in which an object of disgust engendered harsher reactions to vignettes involving the violation of moral standards. Our study did not find results consistent with these experiments, despite the fact that the present study was a conceptual replication of their research.

The failure to demonstrate differences among the odor conditions could be a result of several limitations of the current study, most notably the small sample size (N = 50). There was also a disproportionate number of females in the sample, which may have influenced the results. Furthermore, our Disgust Questionnaire, although containing a few replications of items on the Disgust Sensitivity Scale (Haidt et al., 1994), was a new and unverified dependent measure. The decision to develop a new scale, however, was considered necessary in order to allow us to assess the socio-moral domain in two discrete categories. Since an analysis of a "split" socio-moral domain has not yet been

conducted, an original scale was required to test our hypotheses.

The way in which we asked participants to judge their levels of disgust should also be mentioned. The survey questions themselves, which asked participants to rate their feelings of disgust by the phrase "how disgusted does this make you feel," may have influenced participants' responses in unanticipated ways. Nabi (2002) suggests the word disgust is not commonly understood to represent revulsion to contaminating and offensive stimuli, which is its theoretical meaning. Rather, disgust is commonly conceived as an amalgamation of the emotions of both disgust and anger. With this in mind, it is possible that participants had different interpretations of disgust and anger, and therefore responded with feelings of anger instead of disgust. It should be noted that the researchers who created the Disgust Sensitivity Scale acknowledged individual differences in participants' conceptions of not only core disgust, but socio-moral disgust. "Thus we could not depend entirely on questions asking respondents to rate how disgusting they found a particular situation or experience" (Haidt et al., 1994).

However, the decision to explicitly inquire about participants' emotions (i.e., how disgusted are you? rather than how uncomfortable, grossed out, etc. are you?) was reached because it was the most practical and concise method of inquiry. For example, one of the alternatives we considered was utilizing pictures of facial expressions, in which we would ask participants the facial expression (e.g., disgust, anger, happiness, etc.) that best reflected their emotional reaction to the proposed situation. This would provide a standard representation of emotion on which participants could reliably base their affective experience. Paul Ekman (1971; 1987) has extensively researched facial

expressions, positing that they are culturally universal in nature. However, the method of utilizing facial expressions also presented the possibility of response confusion. Past research has established that distinct facial components of the disgust facial expression convey different things when isolated from one another. Specifically, the unilateral lip raise, which denotes a tightening of the mouth and nose to prevent ingestion of an undesirable stimulus, can be perceived to be a combination of anger, disgust, and contempt in *moral contexts* (Rozin, Lowery, & Ebert, 1994). Therefore, we did not want to incorporate facial expressions because the primary focus of the research would involve assessing moral situations.

Another facet of the current study is elucidated by Simpson et al. (2006). Contrary to our hypotheses, they asserted that core disgust and socio-moral disgust are fundamentally discrete domains. Their study additionally found that emotional responses to core disgust, but not socio-moral disgust, *weakened* as time progressed. Socio-moral disgust, on the other hand, showed an intensification of the emotion as time progressed. This may suggest that individuals become desensitized to core disgust elicitors over time, while individuals become sensitized to socio-moral disgust elicitors over time. In the case of the present study, participants may have habituated to the disgustingness of the noxious odor, thus mitigating the overall effect it had on disgust-related items. Still, the suggestion that socio-moral violations elicited significantly higher amounts of anger than disgust, and that this experience of emotion intensified in relation to time, is an interesting aspect of the literature.

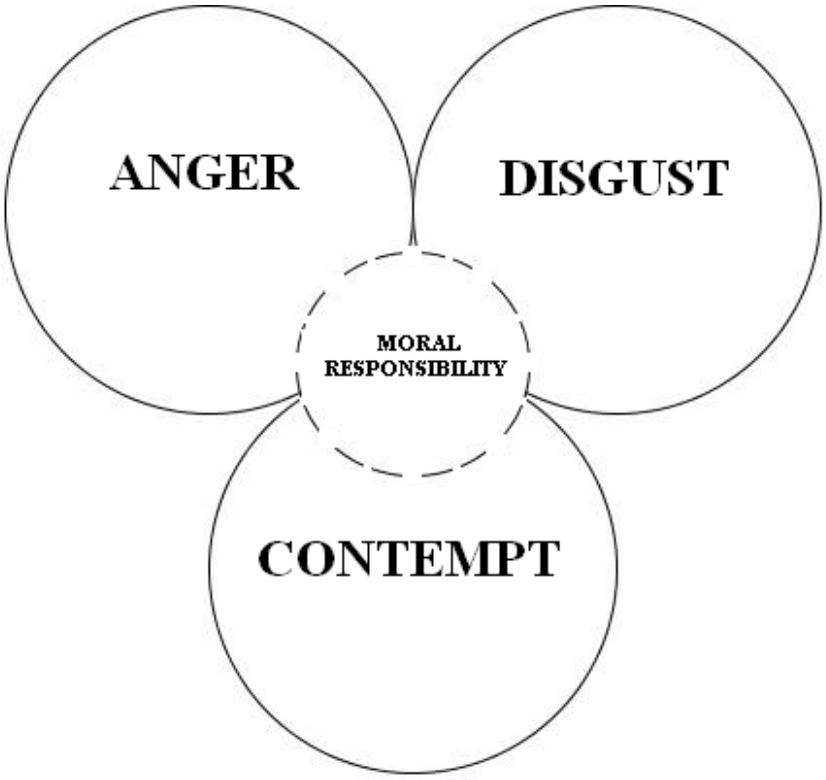
Despite the significant difference between our socio-moral disgust domains,

measures of internal consistency indicate that the “animal” socio-moral and “human” socio-moral domains are relatively poor in reliability. That is, these items of socio-moral disgust may not measure unified experiences in participants. Past research evaluating the similarities between disgust and anger within socio-moral contexts may suggest why these particular constructs are somewhat unreliable. A conceptualization of a dimension of moral emotions, such that anger, disgust, and contempt all function together in situations involving ethical standards (Rozin, Haidt, & McCauley, 1993); may explain this more clearly. The Simpson et al. (2006) findings partly support this moral emotion triad, in that individuals in their study reported both anger and disgust—two of the three emotional components of the triad—represented their reactions to moral offenses.

Furthermore, research has suggested a fundamental and intricate distinction between moral anger and moral disgust, such that situations involving intentional harm elicited moral anger, whereas situations involving bodily violations elicited moral disgust (Russell & Giner-Sorolla, 2011). Considering that a few of our items of “animal” socio-moral disgust can be perceived to include instances of intentional harm (e.g., sexual molestation, mass murder of minority populations, reckless transmission of sexual disease), it is possible that the emotion of anger was evoked instead of disgust, or both anger and disgust were evoked together. That our items may have evoked multiple emotions suggests not only why the reliability analysis of our constructs was poor, but also why the “animal” socio-moral domain included the most severe rating of “disgust.” That is, the severity of the “animal” socio-moral domain may have been reached because disgust and anger were evoked in combination, thus engendering a harsher emotional

reaction. Using the same preadaptation framework on which we based our initial hypotheses, it is possible that systems of emotion co-opt other emotions when a stimulus has implications for moral assessment. This conceptualization may provide possibilities as to why one specific moral situation can evoke an array of emotions. Although each emotion has a distinct function and is elicited by specific criteria, their combination is ultimately triggered by a propensity for humans to scrutinize moral responsibility (see Figure 5).

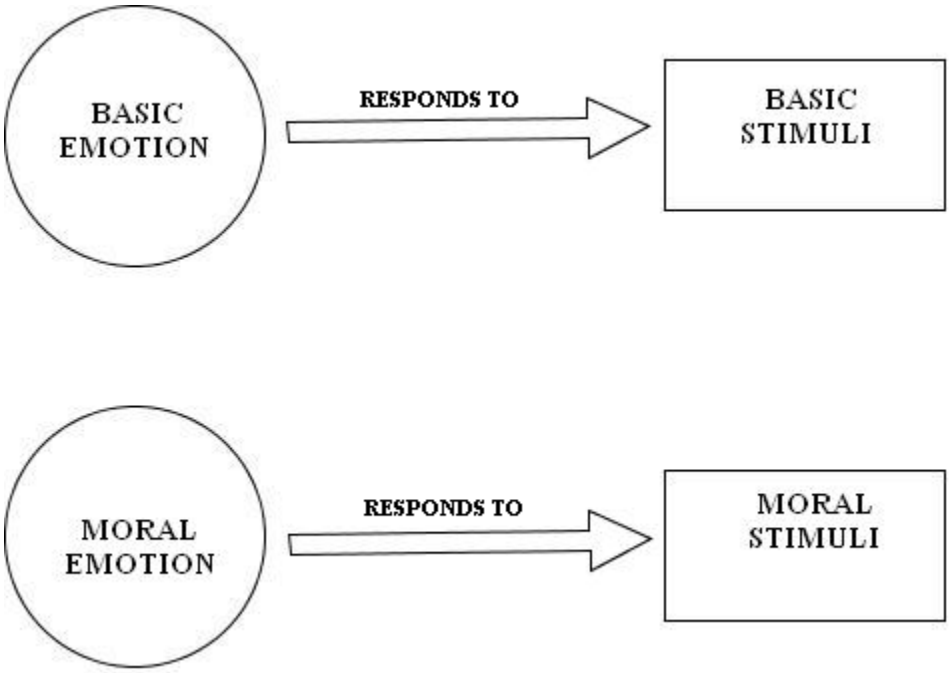
Figure 5: *Moral Emotion Triad*



The present research, however, provides data to suggest that the current conceptualization of socio-moral disgust, wherein the socio-moral domain is posited to be a unified emotional dimension, is inaccurate. Additionally, it provides evidence to suggest that socio-moral violations, and the reactions elicited by them, are exceedingly complex. Research in cognitive neuroscience, for instance, supports the notion that moral judgments are not elicited by a general moral domain, but dependent upon specific situations. Moral transgressions related to disgust, dishonesty, and physical harm each activated discrete regions of the brain, although the dorsomedial prefrontal cortex was influenced by all of these moral situations (Parkinson et al., 2011). The previously mentioned research, in which a precise contrast between the elicitors of moral disgust and moral anger were investigated, also provides support for the complex nature of socio-moral violations (Russell & Giner-Sorolla, 2011).

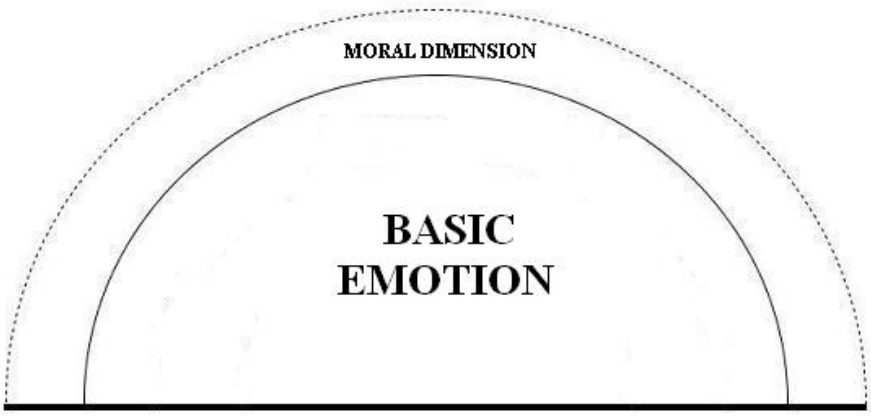
But what distinguishes moral anger from basic anger or moral disgust from basic disgust? Is there a distinction between the affective experience of a basic and moral emotion, or does the distinction between a basic and moral emotion originate from the criteria of the elicitor? Perhaps before we accept the reality of the concept of moral disgust (which, by describing it as *moral* disgust and not *basic* disgust, implies that they are separate systems), future research should investigate if (i) moral emotions exist as a discrete construct, or if (ii) a moral dimension is encompassed within a basic emotional system. Consider Figure 6 for a representation:

Figure 6.1: *Conceptualization of Moral vs. Basic Emotions*



Note. This diagram represents the possibility that moral emotions are separate from basic emotions, and therefore respond to separate stimuli.

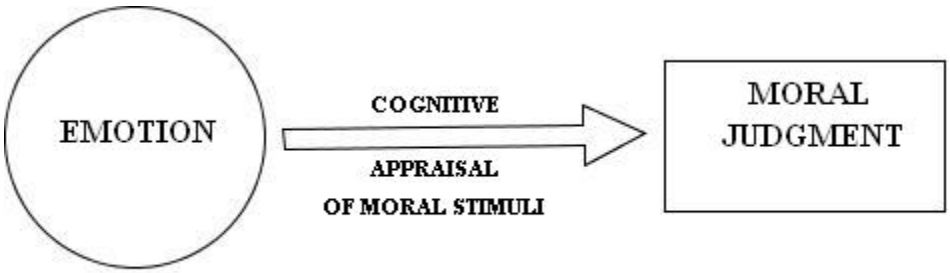
Figure 6.2: *Conceptualization of Moral vs. Basic Emotions*



Note. This diagram represents the possibility that moral emotions are not separate from basic emotions, but rather exist as a moral dimension within the emotion system. Although this was the conceptualization on which we based socio-moral disgust, it is possible that a moral domain exists within other emotions (e.g., anger).

Considering that these moral attributions are oftentimes *judgments*, it may be appropriate to conceive socio-moral violations as an aspect of the interaction between emotion and cognition (see Figure 7). Since it is our emotions that may influence the way in which we perceive socio-moral stimuli, emotional reactions are the product of evaluating that an ethical violation has occurred. To this end, socio-moral stimuli are merely the object of appraisal, rather than a distinct component of systems of emotion.

Figure 7: *Moral Stimuli within the Emotion-Cognition Interaction*



Note. This diagram represents the cognitive appraisal process of socio-moral violations, wherein an emotionally-laden moral judgment is the result of assessing ethical standards.

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Appendix A

AGE: Month_____ Year_____
GENDER: Male___ Female___
DO YOU CONSIDER YOURSELF A SMOKER: Yes___ No___
ETHNIC ORIGIN: Caucasian___ African American___ Other_____
RELIGION (organized or personal): Yes___ No___
POLITICAL ORIENTATION: Conservative___ Liberal___

Using the rating scale, please CIRCLE THE NUMBER that best represents how you feel about each situation or scenario. Respond honestly, as there are no right or wrong answers.

1. A baby looks at you and giggles.
How **happy** does this make you feel?

0----------1----------2----------3----------4----------5----------6
Not at all Slightly Moderately Extremely

2. You and a group of friends laugh at a joke until your sides hurt.
How **happy** does this make you feel?

0----------1----------2----------3----------4----------5----------6
Not at all Slightly Moderately Extremely

3. You try on a sweater and find out it belonged to Adolf Hitler.
How **disgusted** does this make you feel?

0----------1----------2----------3----------4----------5----------6
Not at all Slightly Moderately Extremely

4. You get a well-deserved ‘A’ on your final exam.
How **happy** does this make you feel?

0----------1----------2----------3----------4----------5----------6
Not at all Slightly Moderately Extremely

5. You try on a used pair of jeans from the thrift store that a person who is homeless just sold.
How **disgusted** does this make you feel?

0----------1----------2----------3----------4----------5----------6
Not at all Slightly Moderately Extremely

6. You see someone smoking.
How **surprised** does this make you feel?

0----------1----------2----------3----------4----------5----------6
Not at all Slightly Moderately Extremely

7. You hear a politician speak often about the importance of marriage, but he then gets caught in numerous sexual scandals.
How **disgusted** does this make you feel?

0----------1----------2----------3----------4----------5----------6
Not at all Slightly Moderately Extremely

8. You see a dog and a cat walking side by side down your street.
How **surprised** does this make you feel?

0----------1----------2----------3----------4----------5----------6
Not at all Slightly Moderately Extremely

9. After a long and cold winter, you walk outside and it is warm enough to take off your coat.
How **happy** does this make you feel?

0----------1----------2----------3----------4----------5----------6
Not at all Slightly Moderately Extremely

10. Your neighbor, who has herpes, is simultaneously involved with eight different sexual partners, all of whom are unaware of each other.
How **disgusted** does this make you feel?

0----------1----------2----------3----------4----------5----------6
Not at all Slightly Moderately Extremely

11. Your favorite team wins an extremely close game.
How **happy** does this make you feel?

0----------1----------2----------3----------4----------5----------6
Not at all Slightly Moderately Extremely

12. You almost run out of time taking an exam you expected to be easy.
How **surprised** does this make you feel?

0----------1----------2----------3----------4----------5----------6
Not at all Slightly Moderately Extremely

13. You are putting away dishes and a glass cup falls to the ground, but doesn't break.
How **surprised** does this make you feel?

0----------1----------2----------3----------4----------5----------6
Not at all Slightly Moderately Extremely

14. You see someone smoking.
How **disgusted** does this make you feel?

0----------1----------2----------3----------4----------5----------6
Not at all Slightly Moderately Extremely

15. Unable to intervene, you witness a man sexually molest a seven-year-old child.
How **disgusted** does this make you feel?

0----------1----------2----------3----------4----------5----------6
Not at all Slightly Moderately Extremely

16. You leave the grocery store to find a leaf on the windshield of your car.
How **surprised** does this make you feel?

0----------1----------2----------3----------4----------5----------6
Not at all Slightly Moderately Extremely

17. You are internet browsing and see a picture of a man having sexual intercourse with a dog.
How **disgusted** does this make you feel?

0----------1----------2----------3----------4----------5----------6
Not at all Slightly Moderately Extremely

18. You throw away a tissue and touch mucus that someone spit into a trash can.
How **disgusted** does this make you feel?

0----------1----------2----------3----------4----------5----------6
Not at all Slightly Moderately Extremely

19. You see someone eat an apple with a knife and fork.
How **surprised** does this make you feel?

0----------1----------2----------3----------4----------5----------6
Not at all Slightly Moderately Extremely

20. After an accident, you see a man who is dead with his intestines exposed.
How **disgusted** does this make you feel?

0----------1----------2----------3----------4----------5----------6
Not at all Slightly Moderately Extremely

21. Your neighbor lies about running over your pet with their car, even though you witnessed it happen.
How **disgusted** does this make you feel?

0----------1----------2----------3----------4----------5----------6
Not at all Slightly Moderately Extremely

22. You see someone cheating on a final exam.
How **disgusted** does this make you feel?

0----------1----------2----------3----------4----------5----------6
Not at all Slightly Moderately Extremely

23. You put on your coat and find ten dollars in your pocket.
How **happy** does this make you feel?

0----------1----------2----------3----------4----------5----------6
Not at all Slightly Moderately Extremely

24. You take a sip of soda and realize it is from a glass a stranger was drinking out of.
How **disgusted** does this make you feel?

0----------1----------2----------3----------4----------5----------6
Not at all Slightly Moderately Extremely

25. You win a very competitive scholarship competition.
How **happy** does this make you feel?

0----------1----------2----------3----------4----------5----------6
Not at all Slightly Moderately Extremely

26. A very shy friend turns out to be a very aggressive driver.
How **surprised** does this make you feel?

0----------1----------2----------3----------4----------5----------6
Not at all Slightly Moderately Extremely

27. You see a woman in a toy store slap a doll sitting on a shelf.
How **surprised** does this make you feel?

0----------1----------2----------3----------4----------5----------6
Not at all Slightly Moderately Extremely

28. You wake up in the morning to see the sun shining through the window.
How **happy** does this make you feel?

0----------1----------2----------3----------4----------5----------6
Not at all Slightly Moderately Extremely

29. You are browsing through the television channels and find your favorite movie.
How **happy** does this make you feel?

0----------1----------2----------3----------4----------5----------6
Not at all Slightly Moderately Extremely

30. After an accident, you see a man who is alive with his intestines exposed.
How **disgusted** does this make you feel?

0----------1----------2----------3----------4----------5----------6
Not at all Slightly Moderately Extremely

31. You attend a baby's first birthday party.
How **happy** does this make you feel?

0----------1----------2----------3----------4----------5----------6
Not at all Slightly Moderately Extremely

32. A friend sends you a sentimental card just to make you smile.
How **happy** does this make you feel?

0----------1----------2----------3----------4----------5----------6
Not at all Slightly Moderately Extremely

33. You see a bird chirping on a nearby power line.
How **surprised** does this make you feel?

0----------1----------2----------3----------4----------5----------6
Not at all Slightly Moderately Extremely

34. You walk into the living room of a house and there is a rug on the floor.
How **happy** does this make you feel?

0----------1----------2----------3----------4----------5----------6
Not at all Slightly Moderately Extremely

35. You are doing laundry at the laundromat and someone there tells you they change their underwear once every two weeks.
How **disgusted** does this make you feel?

0----------1----------2----------3----------4----------5----------6
Not at all Slightly Moderately Extremely

36. After two weeks, you finally receive a call about a job interview and are offered the position.
How **happy** does this make you feel?

0----------1----------2----------3----------4----------5----------6
Not at all Slightly Moderately Extremely

37. You see a bunny run from out of the bushes.
How **happy** does this make you feel?

0----------1----------2----------3----------4----------5----------6
Not at all Slightly Moderately Extremely

38. You begin to eat your morning cereal and realize you are using a fork.
How **surprised** does this make you feel?

0----------1----------2----------3----------4----------5----------6
Not at all Slightly Moderately Extremely

39. Your friend keeps potato chips in the refrigerator instead of the cupboard.
How **surprised** does this make you feel?

0----------1----------2----------3----------4----------5----------6
Not at all Slightly Moderately Extremely

40. You attend your best friend’s wedding.
How **happy** does this make you feel?

0----------1----------2----------3----------4----------5----------6
Not at all Slightly Moderately Extremely

41. You meet a man that eats and sleeps with his farm animals.
How **disgusted** does this make you feel?

0----------1----------2----------3----------4----------5----------6
Not at all Slightly Moderately Extremely

42. You have guests over for dinner and they ask to have dessert before the main course.
How **surprised** does this make you feel?

0----------1----------2----------3----------4----------5----------6
Not at all Slightly Moderately Extremely

43. You see someone smoking.
How **happy** does this make you feel?

0----------1----------2----------3----------4----------5----------6
Not at all Slightly Moderately Extremely

44. You touch the ashes of a dead person who has just been cremated.
How **disgusted** does this make you feel?

0----------1----------2----------3----------4----------5----------6
Not at all Slightly Moderately Extremely

45. You walk outside and notice you are wearing two different colored socks.
How **surprised** does this make you feel?

0----------1----------2----------3----------4----------5----------6
Not at all Slightly Moderately Extremely

46. You are walking through a tunnel under a railroad track and smell urine.
How **disgusted** does this make you feel?

0----------1----------2----------3----------4----------5----------6
Not at all Slightly Moderately Extremely

47. You win $1,000 at your very first BINGO tournament.
How **surprised** does this make you feel?

0----------1----------2----------3----------4----------5----------6
Not at all Slightly Moderately Extremely

48. You wake up and notice that your covers fell off the bed.
How **surprised** does this make you feel?

0----------1----------2----------3----------4----------5----------6
Not at all Slightly Moderately Extremely

49. You are barefoot and step in a pile of dog poop.
How **disgusted** does this make you feel?

0----------1----------2----------3----------4----------5----------6
Not at all Slightly Moderately Extremely

50. You receive free tickets to see your favorite band in concert.
How **happy** does this make you feel?

0----------1----------2----------3----------4----------5----------6
Not at all Slightly Moderately Extremely

51. In the news there has been a story of a woman who murdered and dismembered her ten-year-old daughter.
How **disgusted** does this make you feel?

0----------1----------2----------3----------4----------5----------6
Not at all Slightly Moderately Extremely

52. You find out your boss has just been convicted of treason for profit.
How **disgusted** does this make you feel?

0----------1----------2----------3----------4----------5----------6
Not at all Slightly Moderately Extremely

53. You and a friend hug after resolving an intense argument.
How **happy** does this make you feel?

0----------1----------2----------3----------4----------5----------6
Not at all Slightly Moderately Extremely

54. You find that your friend is having an incestuous sexual relationship with their brother.
How **disgusted** does this make you feel?

0----------1----------2----------3----------4----------5----------6
Not at all Slightly Moderately Extremely

55. You see an elderly lady sneak outside to smoke.
How **surprised** does this make you feel?

0----------1----------2----------3----------4----------5----------6
Not at all Slightly Moderately Extremely

56. You hear about a lawyer who is notorious for sneaking around hospitals to gain business from accident victims.
How **disgusted** does this make you feel?

0----------1----------2----------3----------4----------5----------6
Not at all Slightly Moderately Extremely

57. You put your hand into a bucket of squirming earthworms.
How **disgusted** does this make you feel?

0----------1----------2----------3----------4----------5----------6
Not at all Slightly Moderately Extremely

58. You see a rainbow in the night sky.
How **surprised** does this make you feel?

0----------1----------2----------3----------4----------5----------6
Not at all Slightly Moderately Extremely

59. You get an ‘A’ on an exam you expected to fail.
How **surprised** does this make you feel?

0----------1----------2----------3----------4----------5----------6
Not at all Slightly Moderately Extremely

60. You wait in line next to someone that smells like sweat and rotten meat.
How **disgusted** does this make you feel?

0----------1----------2----------3----------4----------5----------6
Not at all Slightly Moderately Extremely

61. You witness a clerk shouting racial slurs to force an African-American family out of a store.
How **disgusted** does this make you feel?

0----------1----------2----------3----------4----------5----------6
Not at all Slightly Moderately Extremely

62. Your best friend quits smoking.
How **happy** does this make you feel?

0----------1----------2----------3----------4----------5----------6
Not at all Slightly Moderately Extremely

63. You see squirming maggots on a piece of meat in an outdoor garbage pail.
How **disgusted** does this make you feel?

0----------1----------2----------3----------4----------5----------6
Not at all Slightly Moderately Extremely

64. You drop your phone in a puddle of water and it still works.
How **surprised** does this make you feel?

0----------1----------2----------3----------4----------5----------6
Not at all Slightly Moderately Extremely

65. You see someone cheat on an exam when the professor leaves the room.
How **surprised** does this make you feel?

0----------1----------2----------3----------4----------5----------6
Not at all Slightly Moderately Extremely

66. You go to the gas station and someone offers to fill up your gas tank for free.
How **happy** does this make you feel?

0----------1----------2----------3----------4----------5----------6
Not at all Slightly Moderately Extremely

67. Someone describes the mass killing that occurred at the hands of the Nazis.
How **disgusted** does this make you feel?

0----------1----------2----------3----------4----------5----------6
Not at all Slightly Moderately Extremely