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Moral Anger, But Not Moral Disgust, Responds to Intentionality

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## Abstract

We propose that, when people judge moral situations, anger responds to the contextual cues of harm and intentionality. On the other hand, disgust responds uniquely to whether or not a bodily norm violation has occurred; its apparent response to harm and intent is entirely explained by the co-activation of anger. We manipulated intent, harm, and bodily norm violation (eating human flesh) within a vignette describing a scientific experiment. Participants then rated their anger, disgust, and moral judgment, as well as various appraisals. Anger responded independently of disgust to harm and intentionality, while disgust responded independently of anger only to whether or not the act violated the bodily norm of cannibalism. Theoretically relevant appraisals accounted for the effects of harm and intent on anger; however, appraisals of abnormality did not fully account for the effects of the manipulations on disgust. Our results show that anger and disgust are separately elicited by different cues in a moral situation.

### Moral Anger, But Not Moral Disgust, Responds to Intentionality

Inscribed in the play [Oedipus at Colonus] is the conflict between, on the one hand, primal taboo - which when violated disrupts the cosmos, results in physical pollution, and demands violent retribution - and, on the other hand, a more enlightened ethical and legal code which takes into account motive and intent (Holmberg, 2004).

In Aeschylus' tragedy Oedipus at Colonus, after Oedipus blinds himself and goes into exile, the dramatist describes a conflict between moral standards. According to the ancient taboos Oedipus has violated, he is guilty; however, under the more advanced legal code current in Athens at the time, he is innocent because he was acting in ignorance and self-defense – without intent and with justification. Although this story is ancient, the conflict between categorical violation of taboos and mitigating circumstances is still alive today. We argue that it is reflected in the difference between the two other-condemning moral emotions of anger and disgust.

Recently, in the field of law (de Cremer & van den Bos, 2007; Maroney, 2006) and in moral judgment more generally (Haidt, 2001), a strong case has been made that emotions and not just reasoning are important for moral judgments in general. The present research proposes a more specific hypothesis about different influences on the distinct moral emotions of anger and disgust. We believe that anger, unlike disgust, responds to two important kinds of contextual cues that determine moral condemnation: whether an act harms other people, and whether an act was committed intentionally. On the other hand, disgust independently of anger is uniquely responsive to whether or not an act has violated a norm about the use of body, such as those against incest or cannibalism.

A number of current theories give answers of varying scope to the question of what kind of things elicit moral disgust versus anger. Rozin, Haidt and McCauley (1993) argue

that as opposed to core disgust, which responds primarily to cues of infection and parasites, the primary function of socio-moral disgust is to preserve the social order. Therefore, individuals or groups may elicit socio-moral disgust just for having done something that is morally wrong or does not fit in within society. More specifically, Jones and Fitness (2008) argue that individuals are specifically disgusted by moral transgressors that use deception and abuse their power. Therefore, according to this definition an individual or group can be deemed as disgusting if they have engaged in a despicable behavior. However, neither of these definitions specifically distinguishes between situations that elicit anger and disgust, and indeed anger is also a plausible response to a norm violation or to deception and abuse.

Recent research has found some evidence that anger and disgust have distinct cognitive elicitors. For example, in research testing the CAD hypothesis of other-condemning moral emotions (Rozin, Lowery, Imada, & Haidt, 1999), disgust was associated with purity violations, which are acts that can be deemed as polluting the body or soul – for example, incest or touching a corpse. Anger, on the other hand, came about principally in scenarios where autonomy ethics were violated, by acts that harmed another individual or violated their rights.

More recent research on anger and disgust has used more controlled manipulations of parallel scenarios to demonstrate different elicitors of moral anger and disgust. Gutierrez and Giner-Sorolla (2007) found that disgust at a scientific experiment responded to a manipulation of whether or not it technically violated a taboo against eating human flesh, while anger responded primarily to manipulations of whether or not the experiment violated the rights of others, although it showed a lesser increase to the fact of taboo violation when harm was not described. In particular, these differences were most apparent when controlling for variance shared by reports of anger and disgust.

The frequent co-occurrence of anger and disgust in moral situations might account for some confusion in the literature about what exactly elicits each kind of response. Some researchers have argued that “disgust” which arises in response to moral offenses is not just different from core disgust, but is actually only a metaphorical use of disgust language to display the true emotion of anger (Bloom, 2004; Nabi, 2002). However, we believe that once the co-occurrence of anger and disgust is controlled for, disgust does have a specific function in moral judgment, although not so broad a function as to cover all types of norm violations. Rather, we think that the specific function of moral disgust is to police norms dealing with the use of the body. This view, we argue, is supported by previously cited studies distinguishing anger and disgust, and by recent neuroscience findings showing differences in the brain systems that respond to violations of sexual and nonsexual moral norms (Moll et al., 2005, Schaich Borg, Lieberman, & Kiehl, 2008).

The present research builds on existing research by examining an additional factor that might influence moral anger independently of moral disgust. Moral anger has been associated not just with attributions of harm, but also with the concept of blame or responsibility (Alicke, 2000; Goldberg, Lerner & Tetlock, 1999; Tetlock et al., 2007). This can itself be influenced by mitigating considerations within a given situation, such as whether actions are intentional (Schlenker, 1997; Weiner, 1995). Past research, however, has not specifically examined the relationship between attributions of intentionality, and anger as opposed to disgust. We believe that disgust’s insensitivity to intentionality, as well as to harm, further distinguishes it from anger. An action that violates a bodily norm is disgusting whether or not it was done intentionally; however, because intent is a component of blame, it has the potential to intensify or eliminate angry responses. Therefore, while intent and harm should predict anger, only the fact that someone has committed a bodily norm violation

should predict disgust. These patterns should be especially clear when controlling for covariance between anger and disgust.

The present experiment looked at moral judgments of a scientist's actions, three elements of which were manipulated in a crossed design: a) whether the scientist violated a taboo bodily norm against the eating of human flesh (vs. a more normal kind of meat); b) whether the scientist symbolically harmed other people by violating their rights (vs. harmed only the self); c) whether the scientist acted intentionally, (vs. unknowingly because of someone else's mistake). The first two manipulations conceptually replicated Gutierrez & Giner-Sorolla (2007), while the third tested our novel hypothesis about intentionality.

### Method

#### Participants

This study consisted of 266 participants. From this number, 25 participants were excluded because they reported themselves to be vegetarians, and thus might have moral objections even to the conditions in which eating of animal instead of human meat was described. The final data set included 241 participants (196 females, 41 males, and 4 who did not identify their sex) between the ages of 18 to 43 ( $M= 19.70$ ,  $SD=3.81$ ). Individuals were recruited from the departmental research scheme at a large university in Britain and received course credit for participating.

#### Design, Materials, and Procedure

This study was a 2 x 2 x 2 between-participants design, manipulating Taboo (High Taboo vs. Low Taboo) x Harm (Harm to others vs. Harm to self) x Intent (Intent vs. No Intent). Participants first read a short hypothetical story, containing the manipulations, and adapted from Gutierrez & Giner-Sorolla's (2007) materials in which the main character, a scientist, technically violated the bodily norm of cannibalism by creating an artificial steak

made out of cloned human cells. Eight different versions of this story orthogonally varied the three characteristics of taboo, harm and intent (see Appendix A for manipulations).

Individuals then responded to several measures of disgust and anger reactions (same measures as Gutierrez & Giner-Sorolla, 2007). These emotions were examined using both words and endorsement of facial expressions because past research has shown that anger and disgust terms in English are often used as synonyms (Russell & Fehr, 1994; Johnson & Laird-Oatley, 1989; Nabi, 2002). The face items were black-and-white photos taken from Rozin et al. (1999). Emotion terms for anger, were angry, infuriated, outraged, and for disgust, disgusted, repulsed, sickened, grossed-out. These items were assessed on a 9-point scale that ranged from 1 not at all to 9 very, and were interspersed among a number of filler positive and negative emotion terms that were not of theoretical interest.

Individuals then responded to specific measures of appraisals of the scientist's actions and gave their overall moral judgment of the actions as "right" or "wrong" (see Appendix B for measures). All of these measures were examined using a 9-point scale that ranged from 1, very strongly disagree to 9, very strongly agree. Two items assessed the evaluation of harm to others. Three items assessed intentionality. As appraisals related to the manipulation of taboo violation, we included items based on a number of existing theories of moral disgust, labeled the abnormality appraisal. These items included concepts of abnormality and impurity (Rozin et al., 1999) as well as inferences of character flaws (Rozin et al., 1993; Miller, 1997). An item was also included to assess whether participants thought the behavior was wrong.

## Results

### Data Preparation

The anger word items (angry, infuriated, outraged), were a reliable scale, Cronbach  $\alpha = .91$ ; as were the four disgust word items (disgusted, repulsed, sickened, grossed-out),



Cronbach  $\alpha = .93$ . Although the negative emotion measures were significantly intercorrelated, the face measurements had their strongest correlations with the corresponding emotion word scales. Anger face endorsement correlated more strongly with the anger word scale,  $r(241) = .68$ ,  $p < .01$ , than with the disgust word scale,  $r(241) = .51$ ,  $p < .01$ , and the difference between dependent correlations was significant,  $t(238) = 4.75$ ,  $p < .001$ . Disgust face endorsement was more strongly correlated with the disgust word scale,  $r(241) = .54$ ,  $p < .01$  than with anger words,  $r(241) = .35$ ,  $p < .01$  and the difference between dependent correlations was significant,  $t(238) = 4.65$ ,  $p < .001$ . As in Gutierrez and Giner-Sorolla (2007), the facial endorsement and the word mean were both standardized, and then averaged together, to create two general measures of anger and disgust. The three appraisal variables were found to be reliable measures: harm appraisal,  $r(241) = .81$ ,  $p < .01$ ; intent appraisal, Cronbach  $\alpha = .78$ ; abnormality appraisal, Cronbach  $\alpha = .87$ . Also, in a principal components factor analysis with varimax rotation, each set of appraisal items loaded on its own factor at .72 or higher, with no cross-loadings over .31.

### Moral Judgment

We were concerned that statistically separating the disgust emotion from anger might result in a form of disgust that had nothing to do with moral judgment of the acts as right and wrong. However, across the conditions it was found that both anger ( $\beta = .45$ ,  $p < .001$ ) and disgust ( $\beta = .33$ ,  $p < .001$ ) uniquely predicted moral judgment. The three appraisals also each uniquely predicted moral judgment, abnormality ( $\beta = .23$ ,  $p < .001$ ), harm ( $\beta = .51$ ,  $p < .001$ ) and intent ( $\beta = .21$ ,  $p < .001$ ). Therefore, both disgust and anger in this context were morally relevant emotions, even controlling for each other, and each of the measured appraisals also contributed to moral judgment in some way.

### Emotions

As in other research on these moral emotions, our composite measures of anger and disgust were correlated overall,  $r(241) = .62$ ,  $p < .01$ . Two general linear model based ANOVAs testing the experimental design were carried out on each emotion, entering the experimental factors as fixed effects in a  $2 \times 2 \times 2$  design, but not controlling for the two emotions' co-activation (Table 1). When anger was the DV, we found main effects for intent, harm and taboo, as well as a significant interaction between intent and taboo. When disgust was the DV, there were significant main effects for taboo and intent, also, the interaction between harm and taboo was found to be marginally significant. No other effects were found to be significant for either emotion, all  $p > .20$ .

However, the main purpose of this research was to disentangle anger and disgust's unique effects, despite their frequent co-activation in moral judgments. We then repeated the previous analyses entering the other emotion as a covariate. For anger as the DV controlling for disgust, we found main effects for intent and harm (Table 1). No other main effects or interactions of the manipulations were significant, all  $p > .10$ . When this analysis was repeated using disgust as the DV controlling for anger, there were significant main effects for taboo and harm (Table 1). Although the effect of harm was unexpected, looking at the means, harm actually reduced disgust reactions, whereas it had increased anger. The main effect of intent was not significant and no interactions were significant, all  $p > .12$ . Therefore, taboo was the only factor that had a positive relationship with disgust.

### Appraisals

To examine the effects of our manipulations on appraisals, three separate ANOVA analyses were carried out with each appraisal in turn as the DV (abnormality, harm, intent). The three experimental factors again served as fixed effects for each  $2 \times 2 \times 2$  analysis. There was a significant main effect of taboo for the abnormality appraisal,  $F(1,233) = 11.69$ ,  $p < .001$ , partial  $\eta^2 = .05$  (Low Taboo:  $M = 3.06$ ,  $S.E. = 0.15$ ; High Taboo:  $M = 3.80$ ,  $S.E. = 0.15$ )

and a significant main effect of harm for the harm appraisal,  $F(1,233) = 129.56$ ,  $p < .001$ , partial  $\eta^2 = .36$  (Harm to Self:  $M = 3.12$ ,  $S.E. = 0.18$ ; Harm to Others:  $M = 6.09$ ,  $S.E. = 0.19$ ); no other effects on these appraisals were significant. The strongest main effect of the intent manipulation was seen on the intent appraisal,  $F(1,233) = 238.05$ ,  $p < .001$ , partial  $\eta^2 = .51$  (No Intent:  $M = 3.25$ ,  $S.E. = 0.15$ ; Intent:  $M = 6.46$ ,  $S.E. = 0.15$ ), but the intent manipulation also had secondary effects on the harm appraisal,  $F(1,233) = 19.45$ ,  $p < .001$ , partial  $\eta^2 = .08$  (No Intent:  $M = 4.02$ ,  $S.E. = 0.18$ ; Intent:  $M = 5.17$ ,  $S.E. = 0.18$ ) and abnormality appraisal,  $F(1,233) = 39.24$ ,  $p < .001$ , partial  $\eta^2 = .14$  (No Intent:  $M = 2.76$ ,  $S.E. = 0.15$ ; Intent:  $M = 4.11$ ,  $S.E. = 0.15$ ). An unexpected interaction was also found between intent and taboo for the abnormality appraisal (A):  $F(1,233) = 7.62$ ,  $p < .01$ , partial  $\eta^2 = .03$ , and for the intent appraisal (I):  $F(1,233) = 6.94$ ,  $p < .01$ , partial  $\eta^2 = .03$ , on inspection of the means it appeared as if the combination of intent and taboo intensified both judgments (No Intent/Low Taboo:  $A = 2.69$ ,  $I = 3.64$ ; No Intent/High Taboo:  $A = 2.83$ ,  $I = 2.86$ ; Intent/Low Taboo:  $A = 3.44$ ,  $I = 6.31$ ; No Intent/High Taboo:  $A = 4.77$ ,  $I = 6.62$ ). Overall, however, each manipulation primarily influenced its corresponding appraisal variable.

As an internal analysis, two multiple regression analyses, one for each of the emotion variables, were conducted for the whole data set across conditions, using the appraisals of abnormality, harm, and intent as predictors. First, we carried out the analyses not controlling for the two emotions' co-activation (Table 2). When anger was the DV, all of the appraisals were significant predictors. However, when disgust was the DV, the harm and abnormality appraisals were the only significant predictors. We then repeated the analyses controlling for the two emotions co-activation, by entering the other emotion as a predictor, so that scores for anger excluded the influence of disgust and vice versa (Table 2). For anger as the DV controlling for disgust, intent and particularly harm most reliably predicted anger; abnormality was a secondary, marginally significant predictor. When this analysis was

repeated on disgust controlling for anger, the abnormality appraisal was the only significant predictor, and the other two variables were not significant.

To see whether appraisals could account for the effects of our manipulations on each emotion, mediation analyses were carried out, controlling again for the other emotion in each analysis where an emotion was a DV (Figure 1). The harm appraisal fully accounted for the relationship between the harm manipulation and anger, while the abnormality appraisal was a partial mediator between the taboo manipulation and disgust. Because all three appraisals (abnormality, harm, intent) were affected by the intent manipulation in our data, we ran three regression analyses examining each appraisal as a possible mediator, controlling for the other two appraisals. When controlling for the other two appraisals, the abnormality appraisal ( $\beta = .07, p=.39$ ) and the harm appraisal ( $\beta = .02, p=.79$ ) were no longer related to the intent manipulation; therefore, these appraisals were no longer potential mediators for this relationship. However, the intent appraisal was related to the intent manipulation when controlling for the other appraisals, and this appraisal fully accounted for the relationship between the intent manipulation and anger.

### Discussion

The following results support our hypothesis that anger but not disgust responds to the contextual cues of harm and intent. Importantly, we found that anger and disgust, as well as their related appraisals, each contributed unique variance to moral judgments. Focusing on our analyses that separated the effects of the two emotions through covariates, as in Gutierrez and Giner-Sorolla (2007), we found that disgust specifically responds to whether or not a bodily violation has occurred, while anger and not disgust responds to harm. However, in extension to this, we also found that anger was influenced by both our manipulation and our measured variable of intentionality. Although intent at first appeared to influence disgust, controlling for anger completely eliminated the influence of the intentionality manipulation on disgust,

while the taboo manipulation remained influential. Therefore, while an actor's intentionality may appear to increase moral disgust, we found that this was entirely due to the concurrent activation of anger in moral situations.

When examining how our measured appraisals related to these moral emotions, we also found that appraisals of harm and intentionality predicted anger. The abnormality appraisal was also slightly related to anger; however, this was expected based on prior findings, in that anger and presumptions of harm often arise in response to bodily norm violations, but to a lesser extent than disgust responses (Gutierrez & Giner-Sorolla, 2007). Moreover, the appraisals of harm and intentionality fully accounted for the effects of their respective manipulations on anger, while abnormality did not similarly explain the effect of the intent manipulation on anger.

In comparison, our abnormality appraisal variable was correlated with disgust overall and was the only appraisal that was related to our taboo manipulation. At the same time, this appraisal variable could not fully account for the effect of our taboo manipulation on disgust. Our measure of abnormality incorporated a number of items, with good internal reliability, that accounted for many of the existing theoretical appraisals that would cause moral disgust toward a bodily violation: purity concerns, abnormality, and negative judgments of the character of the violator. Therefore, although it is always possible that these items missed out a crucial appraisal, it is difficult to see what that appraisal might be. In fact, this measure in its breadth may have also tapped some concerns that are not unique to moral disgust. For example, our intent manipulation unexpectedly affected abnormality judgments across conditions, possibly because intentionally doing harmful (and not just disgusting) things is also out of the ordinary and reflects badly on a person's character. Importantly, though, abnormality did not affect anger when controlling for disgust and appraisals of intent and harm, while it did affect disgust when controlling for anger and

those appraisals. So, the effect of abnormality on disgust, unlike anger, did not primarily depend on the judgment that intentional, harmful actions are also abnormal and show bad character. It may be that that disgust, as opposed to anger, is elicited by the mere perception of a taboo violation such as cannibalism. In that case, more abstract appraisals such as impurity and abnormality may not completely account for the response, or may in fact be post-hoc justifications of it.

Moreover, in legal philosophy, these findings provide empirical support for arguments that disgust is a less allowable emotion under liberal concepts of the law than anger (Nussbaum, 2004). Determining intent is a key concept of liberal jurisprudence; the fact that disgust is not responsive to intent shows it to be a less reasonable emotion than anger, which responds to more legitimate concerns of harm and justice. Not only does disgust encourage avoidance rather than anger's more productive action of reprimand, but disgust's obliviousness to important elements of legal judgment means that it is more likely to be an illegitimate influence on court proceedings. While anger as a motive for punishment can itself be biased, its responsiveness to matters of harm and intent, as we have shown here, makes it a more legitimate motivation of justice concerns. The insight of Aeschylus still applies today; in liberal concepts of the law, breaking a taboo is not a crime, unless it is done with the intent to harm.

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Table 1

Emotions: All main effects and significant interactions

Anger not controlling for disgust						
	F	$\eta^2$				
Intent	24.55 ***	.10	No Intent	-0.25 (0.08)	Intent	0.29 (0.08)
Harm	18.83 ***	.08	Harm to self	-0.21 (0.08)	Harm to others	0.26 (0.08)
Taboo	5.31 *	.02	Low Taboo	-0.10 (0.08)	High Taboo	0.15 (0.08)
			No Intent Low Taboo	No Intent High Taboo	Intent Low Taboo	Intent High Taboo
Intent x taboo	4.72 *	.02	-0.25 (0.11)	-0.24 (0.11)	0.05 (0.11)	0.53 (0.11)
Anger controlling for disgust						
Intent	10.54 ***	.04	No Intent	-0.12 (0.06)	Intent	0.17 (0.06)
Harm	29.72 ***	.11	Harm to self	-0.21 (0.06)	Harm to others	0.26 (0.06)
Taboo	0.08	.00	Low Taboo	0.03 (0.06)	High Taboo	0.01 (0.06)
Disgust not controlling for anger						
Intent	14.29 ***	.06	No Intent	-0.20 (0.08)	Intent	0.20 (0.08)
Harm	0.001	.00	Harm to self	0.00 (0.08)	Harm to others	-0.00 (0.08)
Taboo	17.56 ***	.07	Low Taboo	-0.22 (0.08)	High Taboo	0.22 (0.08)
			Harm to self Low Taboo	Harm to self High Taboo	Harm to other Low Taboo	Harm to other High Taboo
Harm x Taboo	3.41 †	.01	-0.12 (0.11)	0.13 (0.11)	-0.32 (0.11)	0.32 (0.11)
Disgust controlling for anger						
Intent	0.88	.00	No Intent	-0.05 (0.06)	Intent	0.04 (0.06)
Harm	10.15 **	.04	Harm to self	0.14 (0.06)	Harm to others	-0.14 (0.06)
Taboo	12.01 ***	.05	Low Taboo	-0.15 (0.06)	High Taboo	0.15 (0.06)

Note: \*\*\*,  $p \leq .001$ ; \*\*,  $p \leq .01$ ; \*,  $p < .05$ , †,  $p < .10$ . Means are reported and standard errors are in parentheses. Not controlling for other emotion,  $df = 1,233$ ; controlling for other emotion,  $df = 1,232$

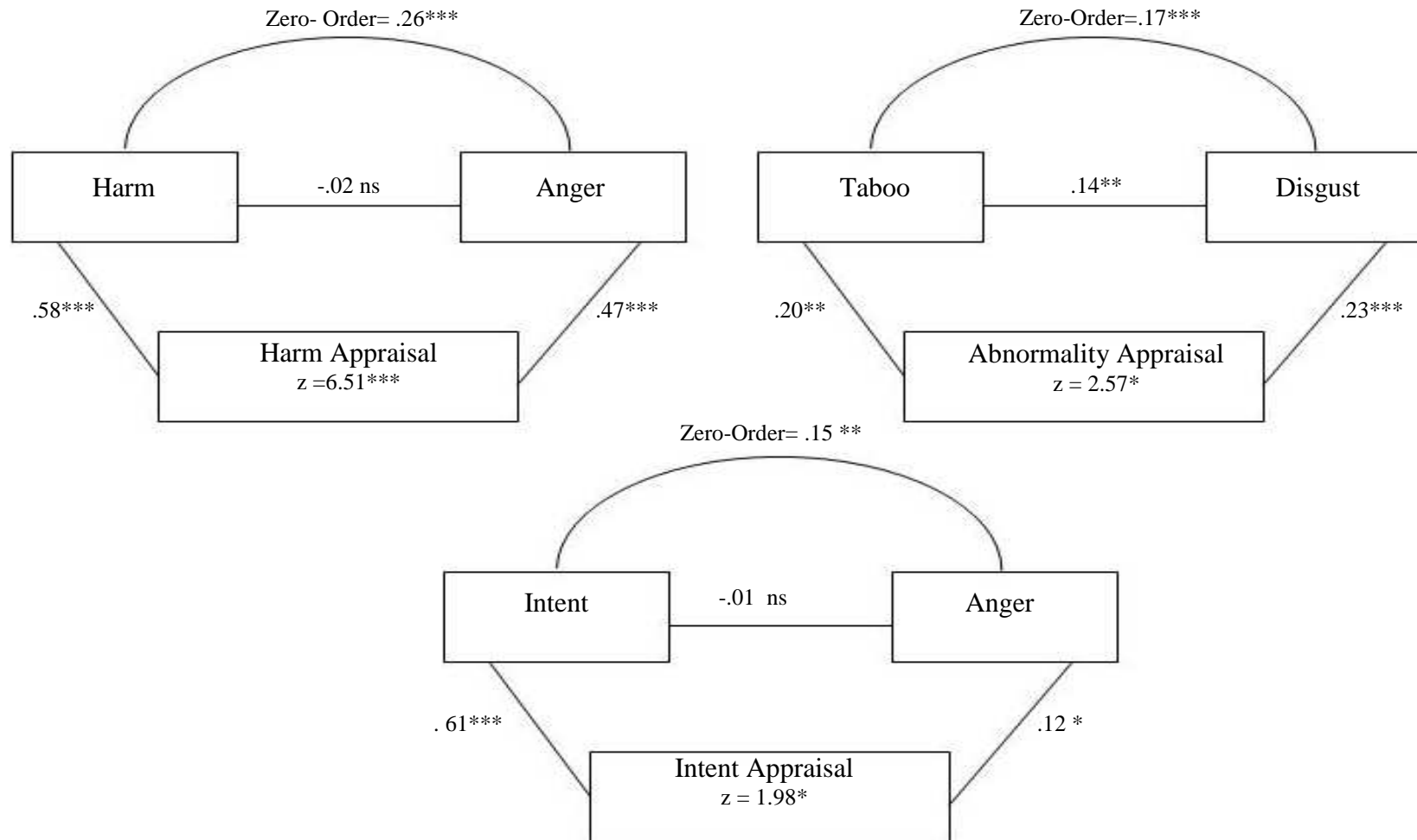
Table 2

## Regression Analyses

	$\beta$	Zero-Order Correlation	Partial Correlation
<b>Anger not controlling for disgust</b>			
Harm Appraisal	.51***	.64	.54
Abnormality Appraisal	.24***	.50	.27
Intent Appraisal	.14**	.38	.17
<b>Anger controlling for disgust</b>			
Harm Appraisal	.42***	.64	.50
Abnormality Appraisal	.10 †	.50	.12
Intent Appraisal	.12**	.38	.16
<b>Disgust not controlling for anger</b>			
Harm Appraisal	.24***	.41	.25
Abnormality Appraisal	.38***	.50	.36
Intent Appraisal	.06	.30	.06
<b>Disgust controlling for anger</b>			
Harm Appraisal	-.02	.41	-.02
Abnormality Appraisal	.26***	.50	.27
Intent Appraisal	-.01	.30	-.01

Note: \*\*\*,  $p \leq .001$ ; \*\*,  $p \leq .01$ ; \*,  $p < .05$ , †,  $p < .10$ .

Figure 1: Analyses of Appraisals as Mediators in Manipulation-Emotion Effects.



Note:  $^{***}$ ,  $p < .001$ ;  $^{**}$ ,  $p < .01$ ;  $^*$ ,  $p < .05$ . Mediation analysis for the intent appraisal's effects was conducted controlling for the effects of the other appraisals, which were influenced to a lesser extent by the intent manipulation.

## Appendix A

## Manipulations

High Taboo, Harm to Others, No Intent: A scientist studying recent advances in biotechnology has recently moved from one lab to another. She asks her research assistant to send her a number of cow muscle cells from the old lab, so she can clone them on a dish. However, the research assistant makes a mistake in labelling the vials, and sends her some cells from the scientist's own arm, that had been used in some unrelated research and proven to be free of disease. The cells grow into a strip of human muscle tissue about the size of a steak, but the scientist doesn't know it's her own flesh. A few days later the scientist is curious about the taste of the human steak that she thinks is beef, so she goes into the freezer and takes out the piece of meat. She then grills it on a barbecue, and serves it at a dinner party to one of her guests, telling him its lab-grown beef. Eventually, the mistake comes to light, and the dinner guest discovers what the meat really was and becomes really upset at being fooled like that. The scientist never repeats the experiment.

High Taboo, Harm to Self, No Intent: A scientist studying recent advances in biotechnology has recently moved from one lab to another. She asks her research assistant to send her a number of cow muscle cells from the old lab, so she can clone them on a dish. However, the research assistant makes a mistake in labelling the vials, and sends her some cells from the scientist's own arm, that had been used in some unrelated research and proven to be free of disease. The cells grow into a strip of human muscle tissue about the size of a steak, but the scientist doesn't know it's her own flesh. A few days later the scientist is curious about the taste of the human steak that she thinks is beef, so she goes into the freezer and takes out the piece of meat. She then grills it on a barbecue, and serves it to herself for dinner. The mistake never comes to light, and the scientist never discovers what the meat really was. Although the experience does not upset her, she does not develop a taste for human flesh and never repeats the experiment.

High Taboo, Harm to Others, Intent: A scientist studying recent advances in biotechnology has recently moved from one lab to another. She asks the research assistant to send some cells from the scientist's own arm, cells that had been used in some unrelated research and proven to be free of disease. The scientist then decides to clone her own cells into a strip of human muscle tissue about the size of a steak, knowing that it's her own flesh. A few days later the scientist is curious about the taste of the human steak, so she goes into the freezer and takes out the piece of meat. She then grills it on a barbecue, and serves it at a dinner party to one of her guests, telling him its lab-grown beef. Eventually, the dinner guest discovers what the meat really was and becomes really upset at being fooled like that. The scientist never repeats the experiment.

High Taboo, Harm to Self, Intent: A scientist studying recent advances in biotechnology has recently moved from one lab to another. She asks the research assistant to send some cells from the scientist's own arm, cells that had been used in some unrelated research and proven to be free of disease. The scientist then decides to clone her own cells into a strip of human muscle tissue about the size of a steak, knowing that it's her own flesh. A few days later the scientist is curious about the taste of the human steak, so she goes into the freezer and takes out the piece of meat. She then grills it on a barbecue, and serves it to herself for dinner. Although the experience does not upset her, she does not develop a taste for human flesh and never repeats the experiment.

Low Taboo, Harm to Others, No Intent: A scientist studying recent advances in biotechnology has recently moved from one lab to another. She asks her research assistant to send her a number of cow muscle cells from the old lab, so she can clone them on a dish. However, the research assistant makes a mistake in labelling the vials, and sends her some cells from the muscle tissue of a sheep, that had been used in some unrelated research and proven to be free of disease. The cells grow into a strip of sheep muscle tissue about the size of a steak, but the scientist doesn't know its sheep flesh. A few days later the scientist is curious about the taste of the sheep steak that she thinks is beef, so she goes into the freezer and takes out the piece of meat. She then grills it on a barbecue, and serves it at a dinner party to one of her guests, telling him its lab-grown beef. Eventually, the mistake comes to light, and the dinner guest discovers what the meat really was and becomes really upset at being fooled like that. The scientist never repeats the experiment.

Low Taboo, Harm to Self, No Intent: A scientist studying recent advances in biotechnology has recently moved from one lab to another. She asks her research assistant to send her a number of cow muscle cells from the old lab, so she can clone them on a dish. However, the research assistant makes a mistake in labelling the vials, and sends her some cells from the muscle tissue of a sheep, that had been used in some unrelated research and proven to be free of disease. The cells grow into a strip of sheep muscle tissue about the size of a steak, but the scientist doesn't know its sheep flesh. A few days later the scientist is curious about the taste of the sheep steak that she thinks is beef, so she goes into the freezer and takes out the piece of meat. She then grills it on a barbecue, and serves it to herself for dinner. The mistake never comes to light, and the scientist never discovers what the meat really was. Although the experience does not upset her; she does not develop a taste for sheep flesh and never repeats the experiment.

Low Taboo, Harm to Others, Intent: A scientist studying recent advances in biotechnology has recently moved from one lab to another. She asks the research assistant to send some muscle cells from a sheep, cells that had been used in some unrelated research and proven to be free of disease. The scientist then decides to clone the sheep cells into a strip of sheep muscle tissue about the size of a steak, knowing that it is sheep. A few days later the scientist is curious about the taste of the sheep steak, so she goes into the freezer and takes out the piece of meat. She then grills it on a barbecue, and serves it at a dinner party to one of her guests, telling him its lab-grown beef. Eventually, the dinner guest discovers what the meat really was and becomes really upset at being fooled like that. The scientist never repeats the experiment.

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## Appendix B

### Appraisal and Moral Judgement Measures

#### Harm Appraisal

- The scientist harmed other people
- The scientist violated the rights of other people

#### Intent Appraisal

- What the scientist did was intentional
- The scientist was not aware of any harm that might be caused to other people (reverse scored)
- The scientist meant to do what she did.

#### Abnormality Appraisal

- The scientist is abnormal because of what she has done.
- The scientist is a lesser human being because of what she has done.
- The scientist has become impure because of what she has done.
- The scientist appears to be mentally unstable.

#### Moral Judgement

- What the scientist did was wrong

#### Other

- The scientist harmed herself
- What the scientist did was justified
- What the scientist did was fair
- What the scientist did was bad
- The scientist should be held accountable for her actions
- The scientist was not aware of any harm that might be caused to herself (reverse scored)